WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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FEBRUARY • 1947

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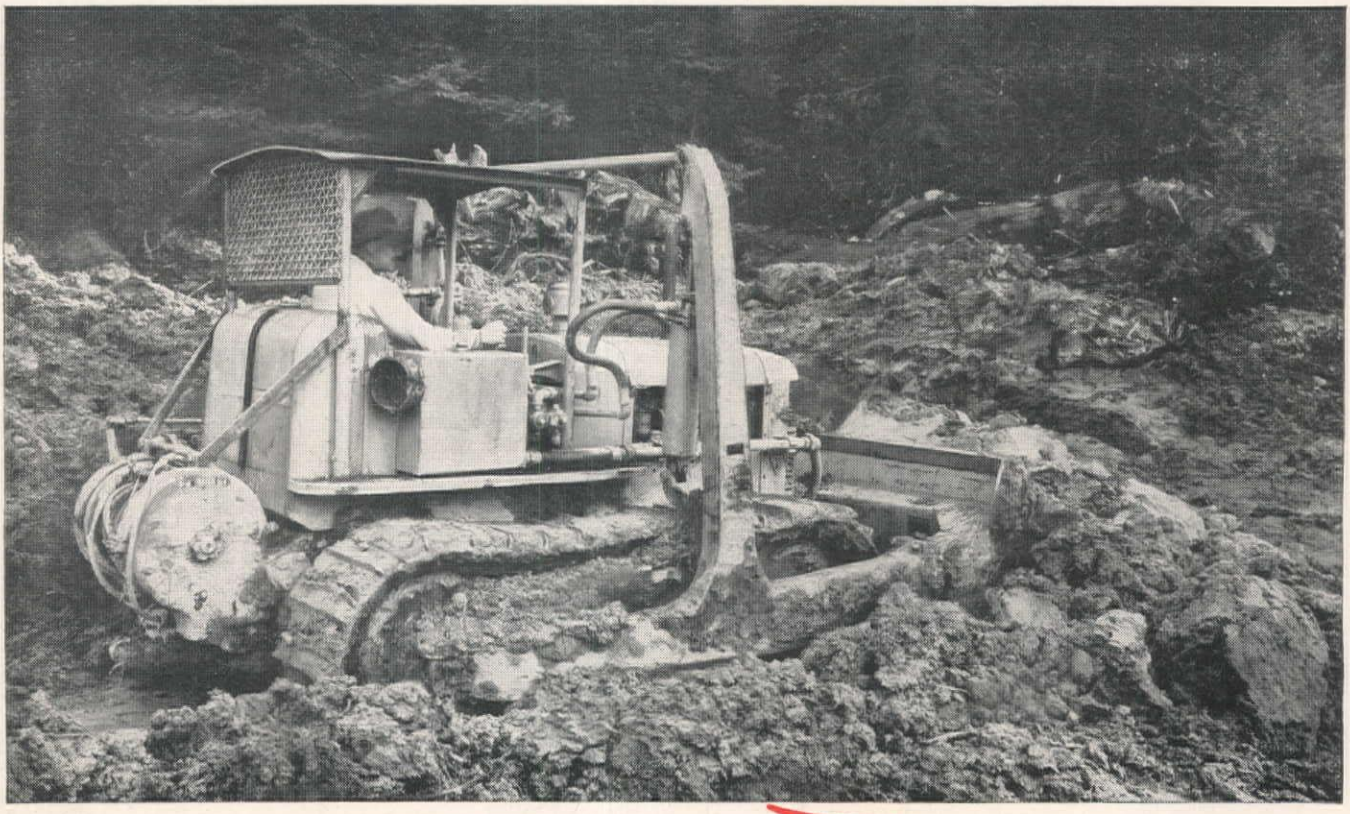
$4.00 PER YEAR

IN THIS ISSUE

THE WORLD'S largest overhead traveling crane, capable of lifting battleship gun turrets and other sections weighing as much as a million pounds, is being constructed in the San Francisco Naval Shipyard by U. S. Steel's American Bridge Co. The crane boasts a 730-ft. runway which spans a pier 405 ft. wide. A total of 8,400 tons of steel went into runway structure and cranes.



JOBS LIKE THIS...

prove the value of the lubricant that Seals out Dirt and Moisture

GOODBYE bearings if that mud ever works its way into them! Put *Texaco Marfak* into a bearing and here's what happens –

Marfak stays where you put it. It doesn't squeeze out when the load is heavy, doesn't jar out when the going is rough. *Marfak holds together.* It clings to the bearing – guards it with a persistent lubricating barrier against dirt and moisture. It protects parts better, longer, with fewer applications.

In wheel bearings, use *Texaco Marfak Heavy Duty.* Here the secret of long-lasting protection is *Marfak Heavy Duty's* ability to form a fluid lubricating film inside the bearing while retaining its original consistency at the outer edges – thus sealing itself in, sealing out dirt and moisture.

Best testimonial to Marfak effectiveness is this fact: *More than 250 million pounds of Marfak have been used to date!*

Use the Texaco Simplified Lubrication Plan for contractors' equipment. For information, 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.

GET FULL ENGINE POWER

Your heavy-duty gasoline and high-speed Diesel engines will run more efficiently and deliver more power when lubricated with oil that keeps them clean – *Texaco Ursa Oil X***. Made especially for this service, *Ursa Oil X*** is fully detergent, dispersive, and has high resistance to oxidation. It keeps rings free, assuring better compression and combustion – great power and fuel economy. It protects bearings from corrosion, greatly reduces engine wear and maintenance costs.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Tune in . . . TEXACO STAR THEATRE presents the NEW EDDIE BRACKEN SHOW every Sunday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.

cal NORTHWEST sales agents

DENVER, COLORADO
The Mine & Smelter Supply Co.

BUTTE, MONTANA
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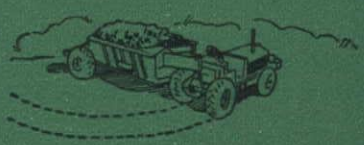
46 EUCLIDS

Moving Earth and Rock for

WORLD'S HIGHEST EARTH-FILL DAM

TOP: Rear-Dump Euclids place 15-ton loads of earth and rock on the fill.

CENTER: Bottom-Dump Euclid being loaded by a 5-yd. shovel with fill material from the stock pile.



Sturdy, universal hitch and ample clearances for drawbar and doors result in faster turning—a definite Bottom-Dump Euclid advantage.

● A fleet of 20 Bottom-Dump and 26 Rear-Dump Euclids is moving earth and rock for construction of the world's highest earth fill structure—Anderson Ranch Dam near Boise, Idaho. Now nearing completion, this combination flood control, irrigation and power dam will be 456 feet high and will contain more than 9,000,000 cu. yds. of earth and rock. Sponsored by the U. S. Bureau of Reclamation, it is being built by Morrison-Shea-Twaits-Winston under the supervision of V. A. Roberts, project manager for the contractors.

Records from all types of mining and construction jobs are evidence of Bottom-Dump and Rear-Dump Euclid efficiency and long life on short and long hauls. Leading contractors prefer Euclids because of their speed in hauling and dumping, and for their versatility and profitable performance. Your Euclid distributor or representative will be glad to discuss your present or future hauling equipment requirements and provide helpful information.

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 February, 1947

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Jobs prove TOURNAPULL.

Beats bad weather

Moving 430,000 yards up 8 to 12% grades to stabilize bank of Chesapeake & Delaware Canal through 6 months of winter cold and spring rains was toughest job for Hendrickson Bros., Inc., in 20 years of dirtmoving. Job conditions — soft caving bank of saturated sand, clay and silt pocketed in unpredictable formations, slippery to load, hub-deep on the haul, mush on the fill. Weather — wet, cold and raw . . . freeze and thaw . . . rain and freeze. Never enough sunshine to dry more than a thin skin over the water-soaked muck. Hendrickson Bros., Inc., licked it with the help of 5 Tournapulls that moved 60% of total yardage . . . stayed on-the-job from start to finish.

Fast on short or long hauls

On New York State Hwy. 16, Triple Cities Construction Corp. used 3 Tournapulls on hauls from 120 to 800' one-way. Working cuts at each end of fill, with 120' haul on one end and 200' on the other, each Tournapull delivered 15 loads an hour. Much of the material was blue gumbo, wet clay and quicksand. On 800' haul the 3 rigs averaged 2500 yards every 8 hours. Production like this on short hauls proves Tournapull's ability to deliver lowest-net-cost-per-yard on ANY length of haul.

Moves tough material

On Connecticut's Wilbur Cross Turnpike, N. D. Maselli Corp. had 360,000 tough yards of stoney gravel, sand, hardpan and decomposed shale, moved 90% with 7 Tournapulls. Helped by LeTourneau Rooter that broke hardest material, Tournapulls put job 33 days ahead of schedule in first 52 days . . . lost only 1½ hours downtime per Tournapull in the 52 days of hard, fast dirtmoving. On 2-mile cycle, each Tournapull averaged 60 yards per hour. "Wouldn't believe our Tournapull records if hadn't been on job myself", said Gus Bonola, superintendent for Maselli.

the basic tool for dirtmoving

Works steep grades

On 170,000-yard overpass job at Ogden, Utah, Gibbons and Reed Construction Co., of Salt Lake City, moved total yardage with their Tournapull fleet over grades that were really tough. Typical cross section on 2440′ cycle showed: Return — 210′ adverse 11%, 230′ adverse 16%, 160′ adverse 11%, 400′ adverse 6%: Haul — 140′ favorable 10%, 160′ favorable 40 to 50%, 150′ favorable 8%, balance negligible; Production — 264 yards of sand per hour for 3 Tournapulls despite traffic hold-ups on hauls across Union Pacific tracks. Rigs drove into job from Las Vegas, Nevada . . . 550 miles in 2½ days.

Versatile for all types of jobs

Rhoten & Frysinger Const. Co. used 2 Tournapulls grading 60,000 yards of clay for racetrack north of Columbus, Ohio. On 400 to 800′ hauls, each averaged 1079 yards per 8-hour day. When 23 days rain shut down job because fill could not go in wet, Rhoten & Frysinger drove Tournapulls 12 miles to Marble Cliff Quarries for stripping, on 2,000′ hauls; each rig did 616 yards per 8-hour day . . . kept right on working and earning. On the two jobs, the 2 rigs moved total of 80,000 yards in 50 days. Later, a third Tournapull was added and all 3 rigs now work full time at quarry (see photo).

Jobs like these prove the high-speed, rubber-tired Tournapull is the basic tool for dirtmoving . . . will handle the major percentage of your yardage at lowest-net-cost-per-yard. Ask your LeTourneau Distributor for more complete information on what Tournapulls will do for you.

LETOURNEAU PEORIA, ILLINOIS — JOB-PROVED Over 4800 Built and Shipped — **TOURNAPULLS** Trade Mark Reg. U. S. Pat. Off. C52

FOR LOWEST NET COST PER YARD

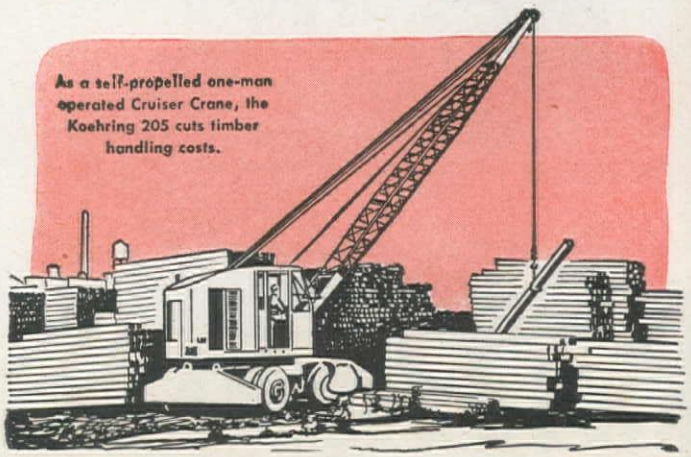
ON SHOVEL JOBS LIKE THIS INDEPENDENT TRAVEL UPS PROFITS

When the cut's shallow and you move up after every third or fourth dipper-full, Koehring independent traction pays big dividends. Here's how it takes a big, important slice out of unproductive move-up time: Because travel is free, independent of all other operations, operator never stops work to shift from swing to travel, never wastes time maneuvering turntable into travel position. Travel is always available, always ready. With move-up time down to the minimum, you load more trucks, get more work done every day. See your Koehring distributor for more facts on the Koehring Heavy-Duty Half Yard.

Other Koehring excavators range in size from ½ to 1½ yards, all built to Heavy-Duty standards.

KOEHRING HEAVY-DUTY

Columbia Equipment Co., *Portland*
Harron, Rickard & McCone Co. of Southern California, *Los Angeles*
Kimball Equipment Co., *Salt Lake City*
McKelvy Machinery Co., *Denver*
Moore Equipment Co., *Stockton*
Neil B. McGinnis Co., *Phoenix*
Pacific Hoist & Derrick Co., *Seattle*
The Harry Cornelius Co., *Albuquerque*
Western Machinery Co., *Spokane*



As a self-propelled one-man operated Cruiser Crane, the Koehring 205 cuts timber handling costs.

JOHNSON

Stores Up to 1,556 Barrels

Big storage capacity . . . 1556 barrels, 1274 barrels, 990 barrels or 708 barrels . . . does not limit the portability of the new Johnson Twin Silo Bulk Cement Plant. Quickly, easily set up by batch plant crane. Disassembled units easily fit trucks and flat cars. Requires minimum of field bolting. Easily moved from one site to the next. Initial cost is low, operating cost at a minimum. Controls conveniently arranged for one-man operation. Can be equipped with 2 batchers for 1-stop loading of 2-batch trucks.

Cramer Machinery Company.....*Portland*
Edward R. Bacon Company.....*San Francisco*
Harron, Rickard & McCone Co. of So. Calif.....*Los Angeles*
McKelvy Machinery Company.....*Denver*
Neil B. McGinnis Company.....*Phoenix*
Pacific Hoist & Derrick Company.....*Seattle*
The Harry Cornelius Company.....*Albuquerque*
Western Machinery Company.....*Spokane*
Western Machinery Company.....*Salt Lake City*

PARSONS

Pipeline and Drainage Model

Accurate trench bottom grading, important in pipeline and drainage work, is easier with the Parsons 200 Wheel Trenchliner. "Double-Pivot" mounting of the husky wheel eliminates inflexible, dirt-catching slide tracks. Wheel hoist clutches are disc type, responsive and sensitive. Hoist lines are 3-part reeved, to give you fraction-of-an-inch adjustability. One operator controls all moves from centrally located lever bank. Uncomplicated direct power flow means more trench per day, gets more power to the wheel.

Columbia Equipment Company.....*Portland*
Harron, Rickard & McCone Co. of So. Calif.....*Los Angeles*
Kimball Equipment Company.....*Salt Lake City*
McKelvy Machinery Company.....*Denver*
Moore Equipment Company.....*Stockton*
Neil B. McGinnis Company.....*Phoenix*
Pacific Hoist & Derrick Company.....*Seattle*
The Harry Cornelius Company.....*Albuquerque*
Western Machinery Company.....*Spokane*

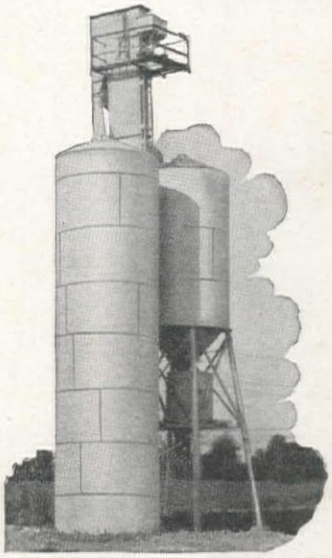
KWIK-MIX

Extra Patches Every Shift

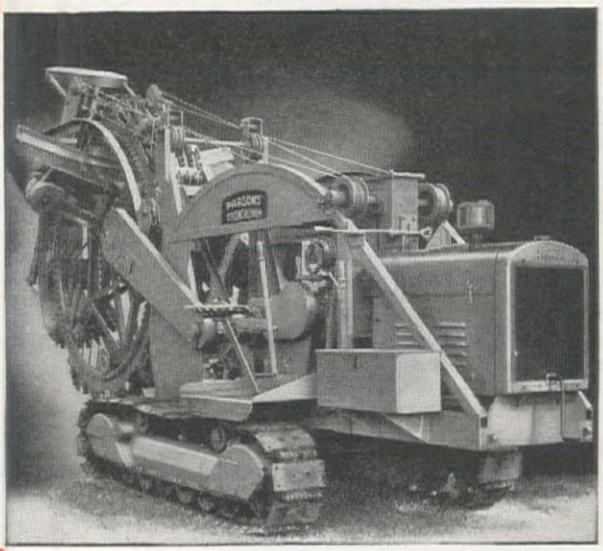
Every day you'll get more work done with Kwik-Mix. Here's why: Both Kwik-Mix No. 10 and No. 14 bituminous mixers combine the advantages of (1) end discharge and (2) non-tilting discharge. End discharge means you pour mix direct into break from mixer. You need no wheelbarrow. Mixer never pulls through patch. Non-tilting discharge — through big, easily opened discharge door — eliminates hard work. Because operator fatigue at end of shift is decreased, you get extra production.

Columbia Equipment Co.....*Portland*
Harron, Rickard & McCone Co. of So. Calif.....*Los Angeles*
Kimball Equipment Company.....*Salt Lake City*
McKelvy Machinery Company.....*Denver*
Moore Equipment Company.....*Stockton*
Neil B. McGinnis Company.....*Phoenix*
Pacific Hoist & Derrick Company.....*Seattle*
The Harry Cornelius Company.....*Albuquerque*
Western Machinery Company.....*Spokane*

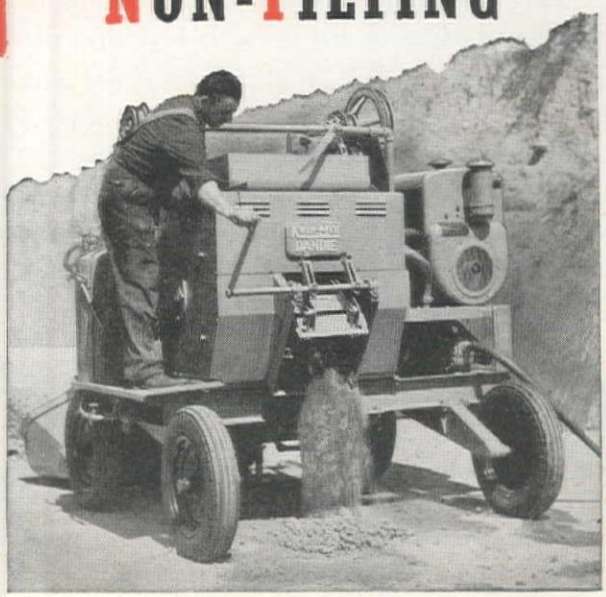
FULLY PORTABLE



PIVOTED WHEEL



NON-TILTING



Long life and low annual maintenance cost are the governing factors in the economical operation of a water distribution system. With both factors assured, as in cast iron pipe, a higher *first cost* is soon offset by a *low cost per service year.* And that is the cost that counts.

The long life of cast iron pipe is a matter of record. In 200 of America's largest cities, some or all of their original cast iron distribution mains are still in use, after 50 to 125 years of efficient service.

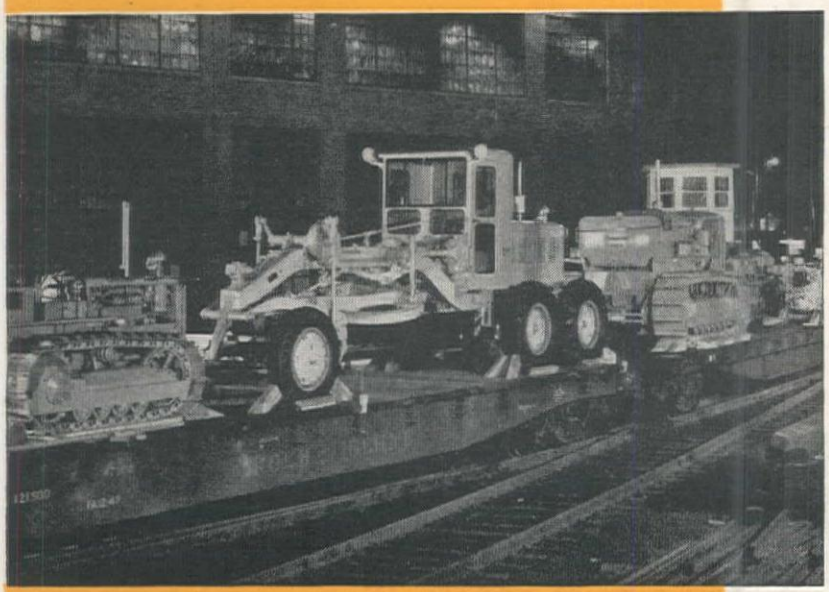
The low annual maintenance cost of cast iron pipe is also a matter of record. Official reports from 195 water works superintendents show conclusively that the annual maintenance cost of cast iron distribution mains is far below that of other pipe materials.

A long life, and an efficient one, has earned for cast iron pipe the right to be known as Public Tax Saver Number One. Saving money day-by-day in maintenance cost. Saving money from generation to generation by avoided replacements that would be necessary were shorter-lived pipe used. Cast Iron Pipe Research Association, T. F. Wolfe, Engineer, 122 S. Michigan Avenue, Chicago 3.

CAST IRON PIPE
SERVES FOR CENTURIES

LOOK FOR THIS MARK — IT IDENTIFIES CAST IRON PIPE

The Embarrassment of Success



EVERY now and then a manufacturer succeeds in making a product so outstanding that public demand for it overwhelms production facilities. In his zeal for winning friends he finds himself making enemies — people eager to buy who cannot be assured immediate or even early delivery.

Thus, the earnestness the manufacturer has given to years of research and development — of product improvement and still better product performance—of efficient manufacture and unusual customer service . . . seems to come back to haunt him.

It is the embarrassment of success.

In becoming the world's leading manufacturer of Diesel engines, track-type tractors and motor graders, "Caterpillar" found many buyers forming a waiting line during the years when all products went into war use. To that waiting line were added many more whose favor was won by the illustrious war performance of these machines.

Thus, despite the fact that "Caterpillar" production is at a high point, demand is still outrunning supply. To catch up—and also to provide an extra margin of facilities for future needs — production is being increased as rapidly as possible by an expansion program that is adding *50 per cent more plant.*

"Caterpillar" is deeply conscious of the problems of the many users who prefer and patiently wait for "Caterpillar" products. "Caterpillar" thanks every customer for such patience in awaiting his turn on deliveries. You can be sure that "Caterpillar" effort is the human utmost. It is live, resourceful — determined that, even in the face of material shortages and disturbed economic conditions, there shall be no unnecessary delays.

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

CATERPILLAR Diesel

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

BETTER ROADS

are coming—at lower cost

Yes, for the vast job ahead in the building of good all-weather roads, alert highway authorities will take advantage of the new high production, low cost methods.

Soil stabilization today has been developing rapidly into an exact science. With greater use of native in-place materials, it is now possible to definitely pre-determine load carrying strength—to properly engineer these roads.

And speedy construction has also reached a new high with the development of the new P&H SINGLE PASS STABILIZER. Here, one machine fulfills the 8 basic requirements of processing native soils at a single pass — with any type of admixture:

1. Control processing depth for accurate proportioning
2. Pulverize the soil thoroughly
3. Blend materials uniformly
4. Create a true sub-grade
5. Disperse the liquid through the entire volume in measured quantity
6. Mix the coated material uniformly
7. Lay the completely processed material in a fluffy, even depth, ready for compaction
8. Do all these things in one pass — at a good rate of speed.

Contractors and Highway Departments contemplating the construction of base courses, light traffic roads, streets, airport runways, etc., should obtain complete information.

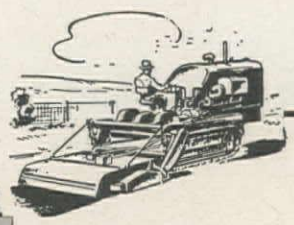
P&H

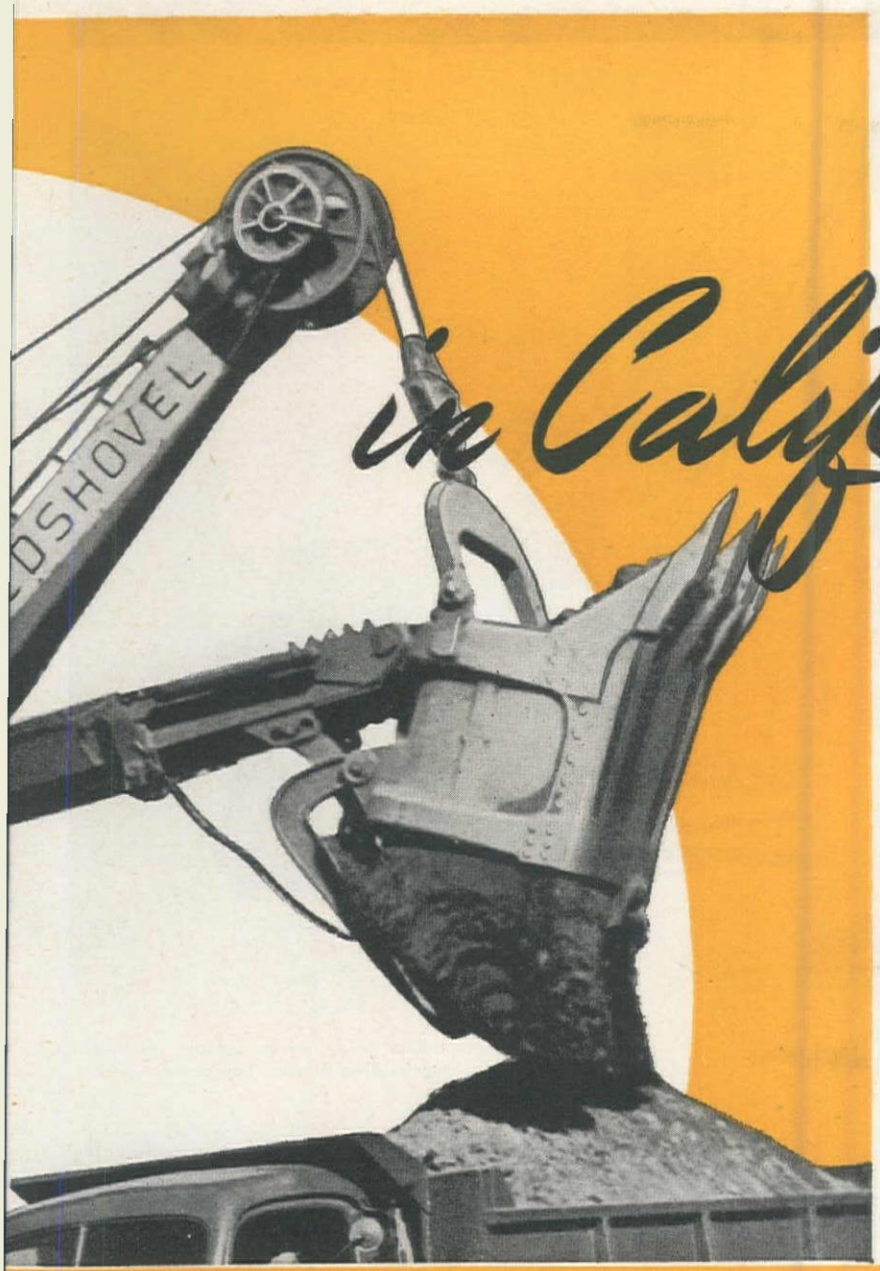
SINGLE PASS STABILIZERS

4490 W. National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · HOISTS · WELDING ELECTRODES · MOTORS





speed in California stamina economy

D. D. PAGE, Operator, says, *"It's a good shovel – plenty fast and easy to operate."*

C. O. JOHNSON, oiler, states, *". . . Very little trouble keeping this baby in shape."*

From FRANK HICKEY–*"One of the best I've ever worked with . . . done a fine job on hard formation . . . fast, easy to handle, has a lot of power . . . easy on cables . . . doesn't use much fuel."*

SPEED! ACTION! Watch the MANITOWOC SPEED-SHOVEL on the job at the big operations in California. On every construction project MANITOWOC is performing at record-breaking speed. Frank Hickey's MANITOWOC is scooping up 3000 cu. yds. in 9½ hours—loading 9 3/10-yd. trucks in 75 seconds. Performance like this means profitable operation. You'll find Speed-Shovel's 1¼-yd. capacity well suited to any kind of digging. Its surplus power comes in handy on hard formations where digging presents tough going. Maneuverable... easy to handle... easy on hoist cables, the MANITOWOC SPEED SHOVEL is available for your jobs now. Demand this rugged construction, economy of operation, easier handling and long trouble-free service in *your* power shovels—GET A MANITOWOC.

Early birds come first for MANITOWOCS. That's why thoughtful buyers are placing their orders now for a new high-speed MANITOWOC.

Improving THE LOS ANGELES RIVER CHANNEL

Bethlehem H-Piles being driven for pier extensions in the Los Angeles River Channel Improvement project.

Slope paving operation showing Bethlehem Reinforcing Bars in position. The "weeps" projecting from the slope are to insure drainage from behind the wall.

Channel improvement of the Los Angeles River is a major engineering project in which various successful contractors are using Bethlehem Pacific Steel products.

One of these contractors, the Guy F. Atkinson Company, is using several hundred tons of Bethlehem H-Piles and Bethlehem Reinforcing Bars. These are going into a 4100-ft section of the channel from Aliso St. to Alhambra Ave.

Here Bethlehem H-Piles are used in constructing bridge-pier extensions. These extensions will streamline the piers to prevent the accumulation of debris that previously reduced the carrying capacity of the channel.

Bethlehem Reinforcing Bars are used in the concrete slope paving on the river banks, the parapet walls and the berm paving.

This contractor, like other progressive western construction firms, has found in Bethlehem Pacific and their distributors a dependable source of steel supply. Every steel construction need, from timber bolts to structural shapes, is available through the facilities of Bethlehem Pacific.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

General Offices: San Francisco
District Offices: Los Angeles, Portland, Seattle, Salt Lake City, Honolulu
Steel Plants: South San Francisco, Los Angeles, Seattle

★ BETHLEHEM STEEL ★

BETHLEHEM PACIFIC

Your Best Bet for Levee Work
INTERNATIONAL Diesel Crawlers

Efficient Dirt Moving Hems in Old Man River

Three International TD-18 Diesel Crawlers moved 150,000 cubic yards of black gumbo with some sand and clay, in 60 calendar days. They were rebuilding a levee near West Memphis, Arkansas, on the Mississippi. Hauls were as long as 1200 feet, daily yardage as high as 30,000. And they loaded at small borrow pits *without pusher assistance* to get capacity loads in 10-yard scoops.

Performance like this points up the superiority of International Diesels for earth-moving. Their 4-cyle valve-in-head engines provide dependable, economical power. Perfect weight distribution, adequate ground contact, rugged construction and extremely durable moving parts give them the ability to handle the toughest earth-moving jobs with ease.

Their built-in, quick-starting system means that they waste no time getting to work. And the little time required for maintenance means *more productive hours in every day.*

This International TD-14 with Trail-builder is shown leveling a haul road on approach to the levee. It also dressed the levee to grade and leveled off the dirt deposited by the three TD-18's and scoops. This is a fast, powerful and easy-to-handle Diesel Crawler —ideal for this work.

Yes sir! Your best bet for levee work, as for other earth-moving, is the International Diesel Crawler. Get the latest information, facts and figures on International Crawlers, Wheel Tractors, Power Units and Diesel Engines now in production, from the International Industrial Power Distributor near you.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue, Chicago 1, Illinois

Tune in James Melton on "Harvest of Stars" every Sunday, NBC Network

INTERNATIONAL *Industrial Power*

CRAWLER TRACTORS • WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS

GOING INTO MORE AND MORE CONTRACTORS' EQUIPMENT

DIESEL BRAWN WITHOUT THE BULK

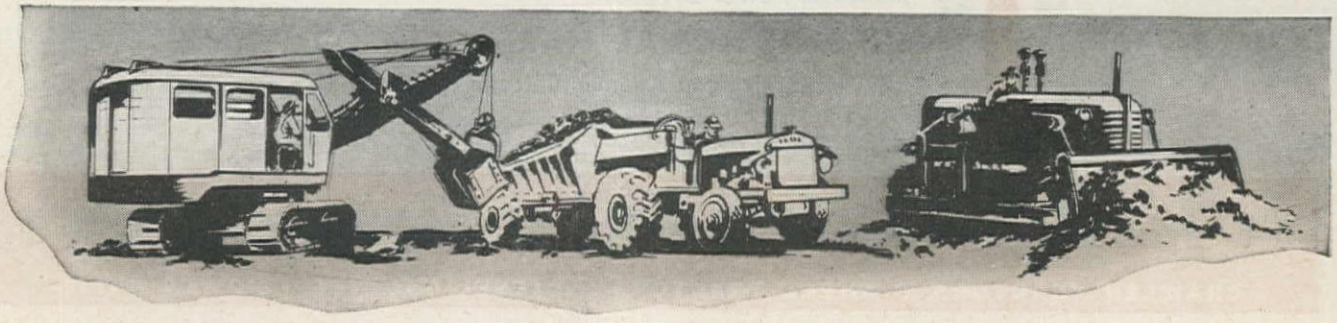
Every day sees more and more General Motors 2-cycle Diesel engines going into contractors' equipment.

The reason is clear. These tough, dependable Diesels provide great power in moderate space and weight. They start easily—pick up their load fast—and run more smoothly.

All because GM Diesels produce power at every piston downstroke. Not a piston loafs through a single revolution.

At the same time, these engines are designed for easier servicing. There's no high-pressure fuel tubing. Injector, pump and metering mechanism are all in a single unit that can be changed in a matter of minutes. When needed, genuine GM replacement parts are always readily obtainable.

Any machine with GM Diesel power is a better machine—sturdy, dependable, economical. So whatever equipment you buy, specify a GM Diesel engine.



GM DIESEL DISTRIBUTORS

All over the country there are competent industrial distributors of GM Diesel engines. They are ready to supply contractors and construction men with equipment powered with GM 71 Diesel engines, with skillful service, and with genuine GM replacement parts.

ALBUQUERQUE, NEW MEXICO
The Harry Cornelius Company

ATLANTA, GEORGIA
Blalock Machinery & Equipment Co.

BALTIMORE, MARYLAND
McClung-Logan Equipment Co., Inc.

BIRMINGHAM, ALABAMA
Armstrong Equipment Co.

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Equipment Supply Company

GREENSBORO, NORTH CAROLINA
E. F. Craven Company

HOUSTON, TEXAS
Stewart & Stevenson Services

INDIANAPOLIS, INDIANA
Flesch-Miller Tractor Co.

JACKSON, MISSISSIPPI
Taylor Machine Works

JACKSONVILLE, FLORIDA
General Motors Corporation
Florida Diesel Engine Sales

LEXINGTON, KENTUCKY
Sheppard & Bogie Equipment Co.

LOS ANGELES, CALIFORNIA
Anderson-O'Brien Co.

MEMPHIS, TENNESSEE
Lewis Diesel Engine Company

MIAMI, FLORIDA
Gulf Engineering Corporation

MILWAUKEE, WISCONSIN
Drott Tractor Co., Inc.

MISSOULA, MONTANA
Mountain Tractor Company

MONTGOMERY, ALABAMA
Alabama Machinery & Supply Co.

NEW ORLEANS, LOUISIANA
George Engine Company

OAKLAND, CALIFORNIA
Bay Cities Equipment Co.

OKLAHOMA CITY, OKLAHOMA
The Diesel Power Company

OMAHA, NEBRASKA
Fehrs Tractor & Equipment Co.

PHILADELPHIA, PENNSYLVANIA
Frantz Equipment Company

PITTSBURGH, PENNSYLVANIA
Highway Equipment Company

PLAINVIEW, TEXAS
Haynes Machinery Co.

PORTLAND, MAINE
Eastern Tractor & Equipment Co.

PORTLAND, OREGON
Gunderson Bros. Equipment Corp.

RICHMOND, VIRGINIA
Bemiss Equipment Corporation

SACRAMENTO, CALIFORNIA
Capitol Tractor & Equipment Co.

SALT LAKE CITY, UTAH
Cate Equipment Company

SEATTLE, WASHINGTON
Lomen Equipment, Inc.
(For Alaska)

SEATTLE, WASHINGTON
Evans Engine & Equipment Co.

SPOKANE, WASHINGTON
Fred M. Viles & Company, Inc.

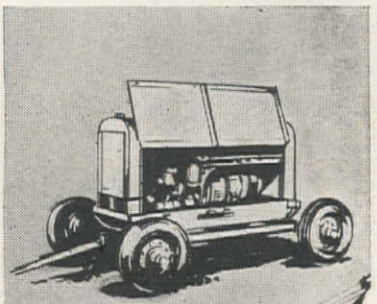
ST. LOUIS, MISSOURI
Western Machinery Company

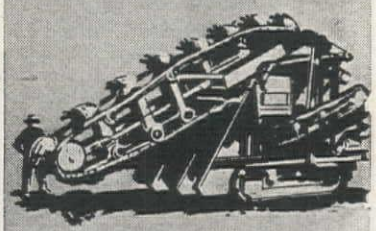
ST. PAUL, MINNESOTA
Borchert-Ingersoll, Inc.

STEUBENVILLE, OHIO
Ray C. Call Company

STOCKTON, CALIFORNIA
Moore Equipment Company

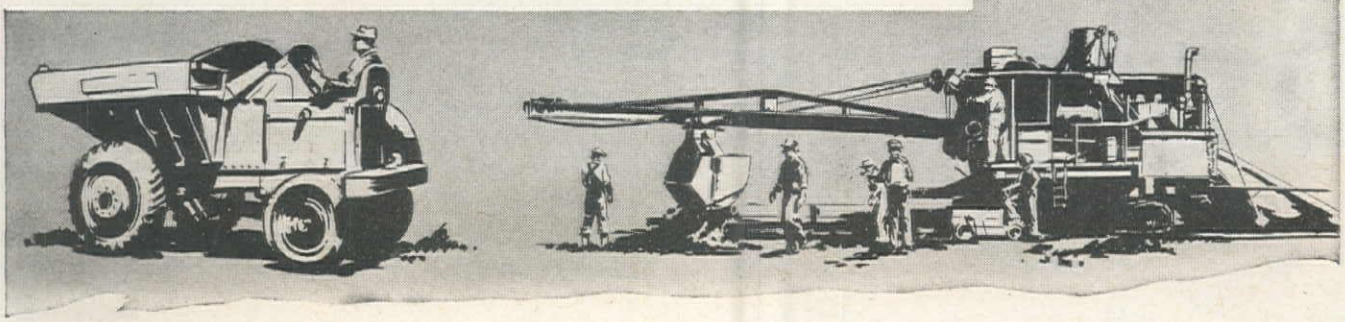
WILKES-BARRE, PENNSYLVANIA
Standard Equipment Co.

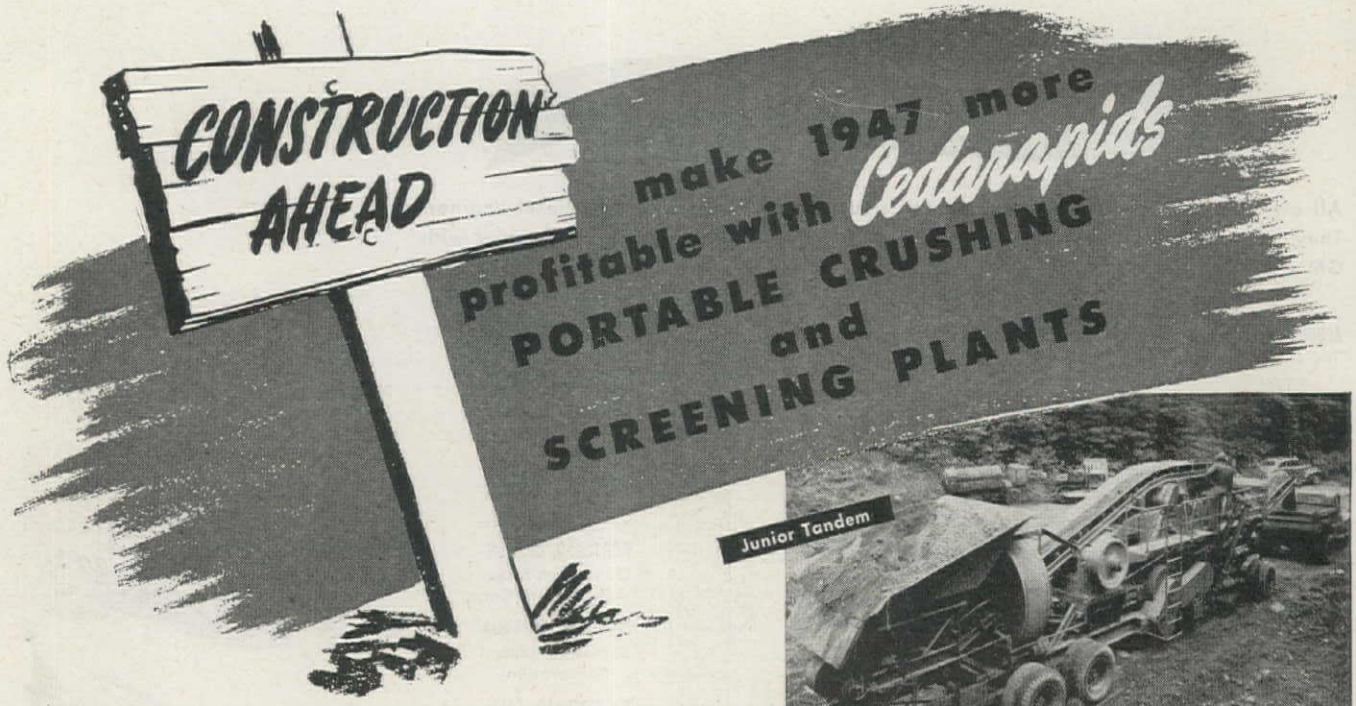




GM
GENERAL MOTORS
DIESEL POWER

DETROIT DIESEL ENGINE DIVISION
DETROIT 23, MICH. ● { SINGLE ENGINES . . *Up to 200 H.P.* / MULTIPLE UNITS . . *Up to 800 H.P.*
GENERAL MOTORS



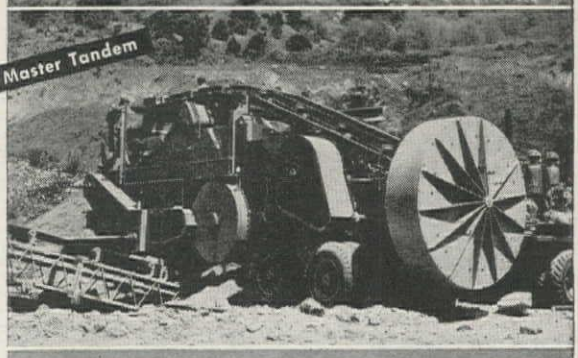


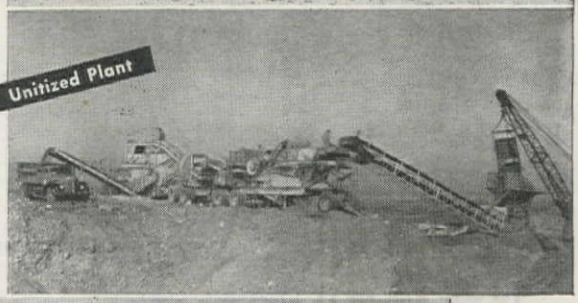
$7½ billions of heavy construction in 1947! Millions and millions of tons of aggregate will be needed.

Here's the line of modern, portable crushing and screening plants that will help you make more money for producing that aggregate. Every unit is made of the finest possible material and skillfully engineered to assure long, trouble-free operation, low-cost production and flexibility to meet every operating condition.

- 100 to 150 tons per hour of 1" material are easy for the big Cedarapids Master Tandem.
- The Cedarapids Junior Tandem is similar to the Master but smaller in size.
- The Cedarapids Pitmaster is our smallest portable straightline crushing plant but owners say there's nothing small about its production.
- The Cedarapids Unitized Plant is the most versatile, portable crushing, screening and washing plant ever offered. Will handle rock or gravel, dry or washed—with almost any desired capacity.
- The Cedarapids Portable Hammermill plant is the ideal unit for large production of agstone and road stone.

See your nearest Cedarapids dealer for details. When you buy a crushing plant — buy the best — buy Cedarapids.

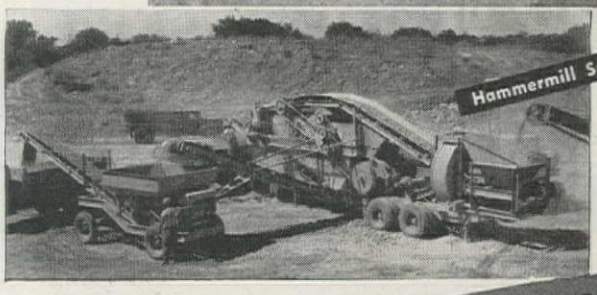




THE IOWA LINE

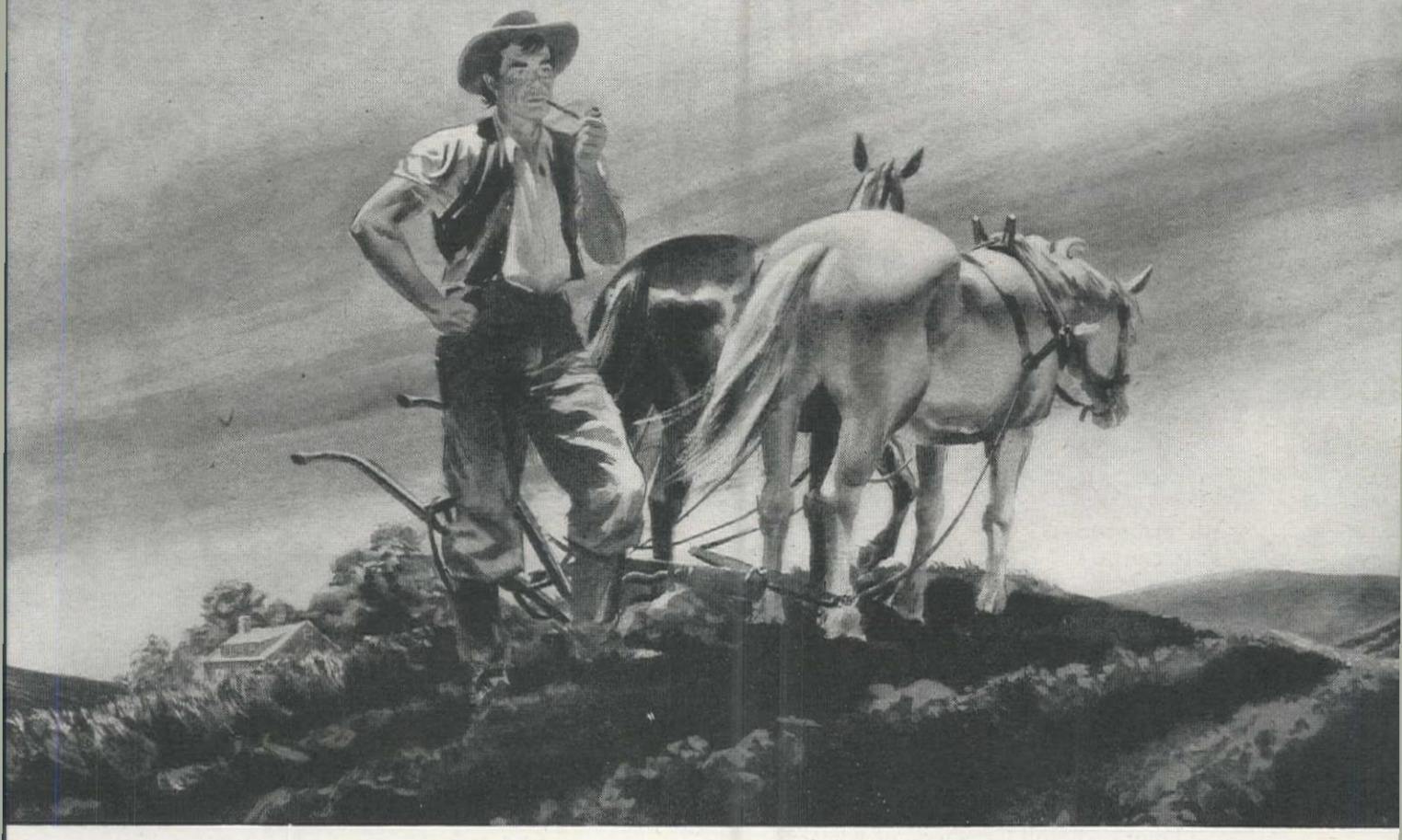
of Material Handling Equipment is distributed by

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, U. S. A.
Cedarapids
Built by IOWA

CONFIDENCE . . . how much is it worth?



IN 1841, two years before the first telegraph line was installed in this country, and when there were but 27 states in the Union, John August Roebling was inspired with the idea of making a new kind of rope of unheard of strength and flexibility. His confidence in his idea caused him to risk everything he had on the development of his new rope.

How much is his confidence worth to Industry today, which couldn't turn a wheel without the modern wire rope?

Today, the John A. Roebling's Sons Company invests much time, effort and money in the development of improved products to keep alive the confidence of its many customers.

Roebling values this confidence as its greatest asset. That's why it offers you the greatest value for every dollar you invest . . . in *any* Roebling product.

HOW TO SAVE WIRE ROPE DOLLARS

Wire rope is a machine of many parts and, like any machine, even the finest of wire ropes can be destroyed quickly through faulty installation or improper maintenance. To insure against this possibility, Roebling established its Field Engineering Service.

Every Roebling Field Engineer has a thorough knowledge of wire rope . . . its types, its uses, its features and limitations. This knowledge plus the experience he gains in his daily contacts can be a great asset to you . . . helping you to solve those tough wire rope problems . . . giving you more service for each wire rope dollar.

Get to know your Roebling Field Engineer. Call him at your nearby Roebling Branch Office.

JOHN A. ROEBLING'S SONS COMPANY
OF CALIFORNIA

San Francisco • Los Angeles • Seattle • Portland

FOR EXAMPLE—"BLUE CENTER" STEEL WIRE ROPE

Roebling entrusts your confidence in Roebling and Roebling products to the performance of its "Blue Center" Steel Wire Rope. It is the best rope Roebling knows how to make. It is available as preformed or non-preformed, in a complete range of sizes and constructions to meet a great variety of operating conditions. Its uses are almost unlimited and its performance is consistently economical.

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

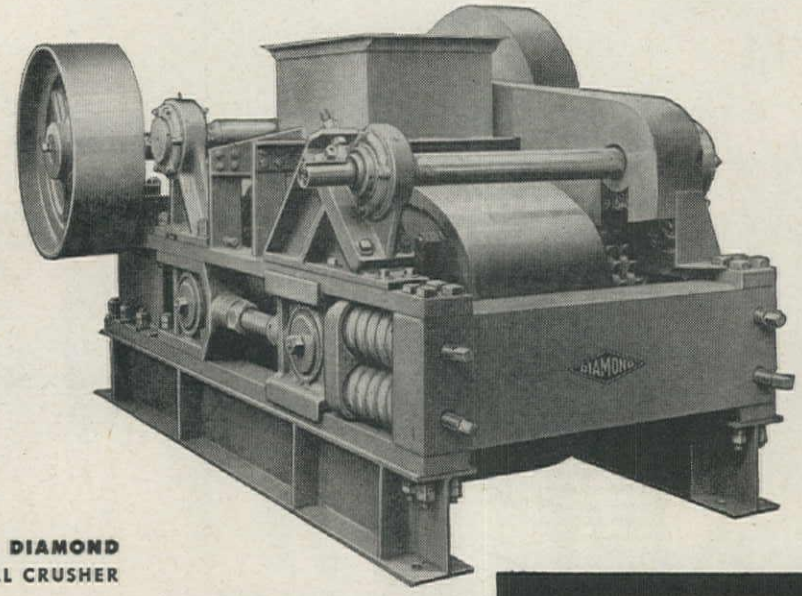
ROEBLING

A CENTURY OF CONFIDENCE

JAR ROEBLING

A BRUTE WITH ABILITY...

TO TAKE LONG TIME PUNISHMENT



THE **DIAMOND**
ROLL CRUSHER

THERE'S NOTHING TOUGHER THAN A DIAMOND

Any Owner of a DIAMOND Roll Crusher Will Tell You...

Diamond Roll Crushers, of whatever size, are designed throughout for ample margin over rated capacity. Years of watchful experience are engineered into every part—the experience of cooperating owners throughout the world—operators who have consistently improved their profits with Diamond-engineered equipment.

DIAMOND

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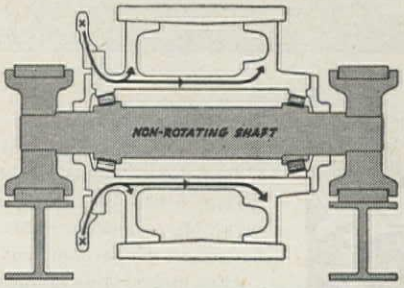
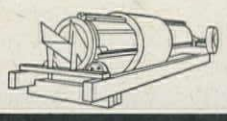
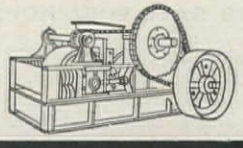
SEVERAL REASONS WHY...



The working rolls of the Diamond rotate on a stationary shaft. Internal housing allows larger roller bearings—more rollers to take the punishment. Rolls are driven through large cast steel sprockets bolted directly to the roll-head, totally relieving twisting stress on shaft. .the DIAMOND can take more punishment. *Your Diamond dealer has Bulletin D-45C—for full specifications.*





DIAMOND

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING COMPANY DIVISION
MINNEAPOLIS 11, MINNESOTA

YOUR NEAREST DIAMOND DEALER FOR SALES AND SERVICE

Oakland	SOULE' EQUIPMENT CO.	*Seattle*	A. H. COX & CO.	*Salt Lake City*	FOULGER EQUIPMENT CO.
Los Angeles	GARLINGHOUSE BROS.	*Denver*	CONSTRUCTORS EQUIPMENT CO.	*Boise & Spokane*	WESTERN EQUIPMENT CO.

LIKES TRAILMOBILES —ORDERS MORE!

"The Trailmobiles are the best of the bunch—in fact they are the easiest riding and rolling trailers that we operate. We can judge the vibration and riding qualities of a trailer by the number of globes we have to replace in the clearance lights of our trailers, and the Trailmobiles require the least replacements." That is the information we get from Tommy Russell, partner in Russell & Walsh, Oakland lumber haulers.

They use Trailmobiles in hauling lumber from mills in Southern Oregon to points in Central California. They make the 800-mile round trip every 24 hours, working on a 5-day weekly schedule, piling up an average of 20,000 miles per month. That's making the most of their rolling stock, and they have to have good trailers to lug 12,000 feet of lumber on each trailer on such a continuous schedule. So, they've ordered more Trailmobiles.

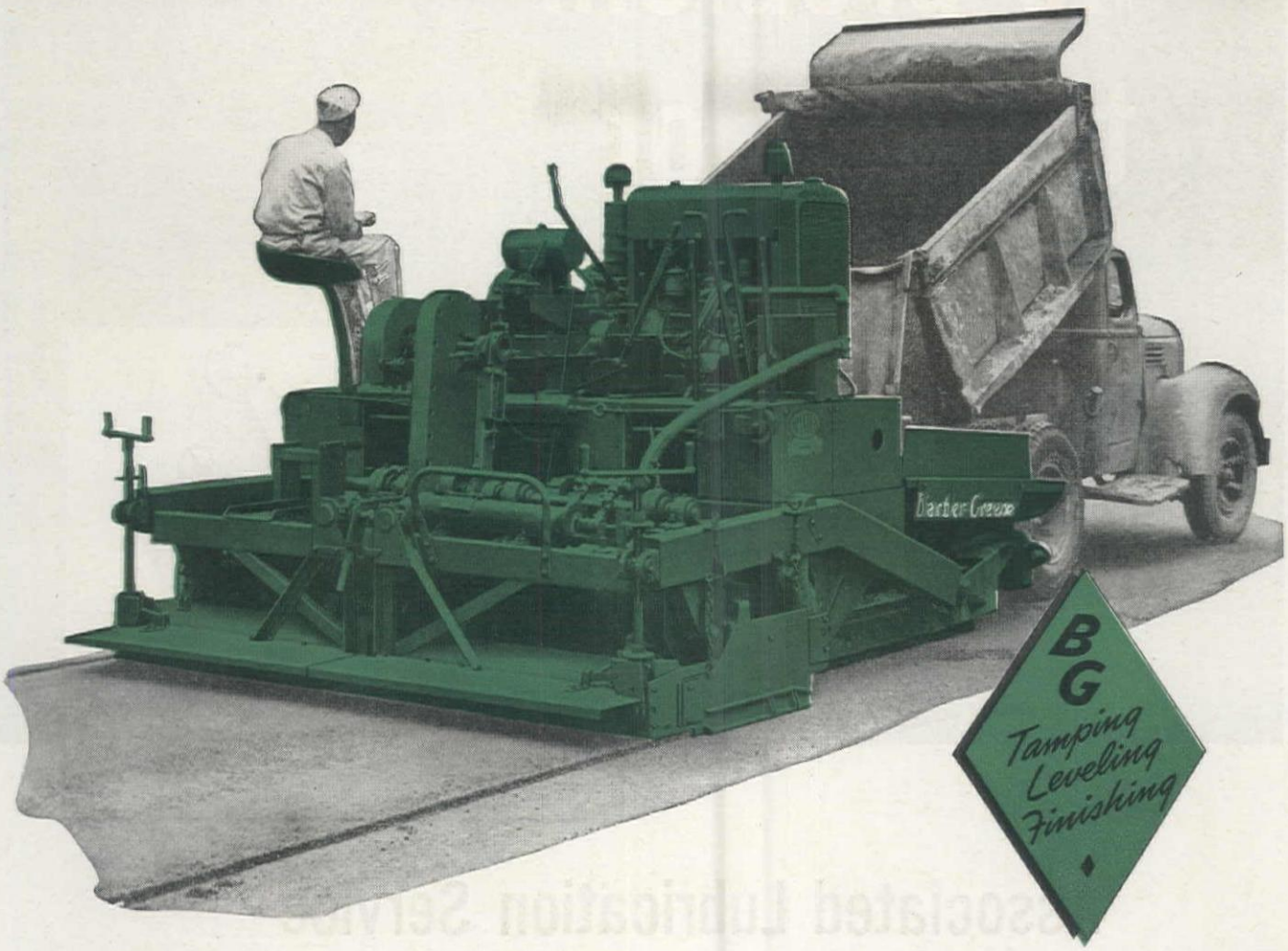
THE TRAILMOBILE COMPANY
BERKELEY, CALIFORNIA

TRAILMOBILE

LOS ANGELES • BERKELEY • SACRAMENTO • SANTA ROSA • FRESNO • SAN JOSE • BAKERSFIELD • STOCKTON • OGDEN • SEATTLE
HONOLULU • SANTA BARBARA • PORTLAND • EUREKA

Barber-Greene

does the *"IMPOSSIBLE"* — automatically!



After you've watched any or all other finishers at work, see the B-G Tamping-Leveling Finisher! Alone among them all the B-G Finisher *automatically* measures the correct amount of compacted material and produces a level surface of uniform density—*a surface that is smooth and level, regardless of irregularities of the sub-grade.*

You might well have thought this an "impossible" job but it is only one of many features of B-G Finisher performance. It has a simple crown adjustment—places adjacent strips with no ridges at the joint. It handles any mix—hot or cold. Flexible, maneuverable and economical to operate, it offers outstanding performance from every standpoint.

BARBER-GREENE COMPANY · AURORA, ILLINOIS

Constant Flow Equipment

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

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; Wilson Equipment & Supply Co., Cheyenne, Wyoming; Wilson Equipment & Supply Co., Casper, Wyoming.

LE ROI MILWAUKEE

A leader in portable air power and a leader in rock-drilling equipment join to give you new standards of rock-drill service and performance

Service

We are emphasizing prompt, efficient service because it is a basic Le Roi policy. It is so important to us that no one holds a Le Roi franchise who doesn't conform to our rigid requirements. Nation-wide, Le Roi service is handled by well-trained, experienced, and competent men. All service outlets are conveniently located to assure you of speedy attention.

Performance

Users tell us that the AIRMASTER line of compressors is portable air power at its best. These fine compressors are now teamed with the well-known line of popular, fast-drilling Cleveland rock drills. For example, the 55-lb. H-111 hand-held drill, thanks to a happy combination of high drilling speed, dependability, and easy holding, is hard to beat. The Cleveland wagon drill establishes new drilling records almost everywhere that it is put to work — unusual flexibility and the power to drill deep holes are mainly responsible. Mines, with the job of producing metals critically needed in our economy, call on Cleveland drills to help step up their tonnages.

The Future

Le Roi and Cleveland Rock Drill are now one — this includes all Cleveland's basic patents and all patents pending. Cleveland and Le Roi designers and metallurgists are all members of the same family. To rock drill users, this combination of talent and experience means, in addition to new standards of service, future developments that will further serve to reduce drilling costs.

LE ROI COMPANY

Cleveland Division

Manufacturers of Cleveland Rock Drills

CLEVELAND 11, OHIO

LE ROI COMPANY, *General Offices*, Milwaukee 14, Wis.

New York • Washington • Cleveland • Milwaukee
Birmingham • Tulsa • Butte • San Francisco

INTERNATIONAL

Announcing— NEW MODELS INTERNATIONAL TRUCKS

Truck owners will operate them—drivers will drive them—*with greater pride than ever before.*

They're the new KB Models of International Trucks—outstanding products of advanced design, engineering and research—newly styled with flowing lines sharply accented by gleaming chrome, and with 95 features and improvements variously incorporated throughout 15 basic models.

And fully qualified to do their jobs with new economy, new ease of operation, and the rugged stamina for which Internationals are *famous!*

They're the finest values in more than 40 years of International Truck history. And International values have always been outstanding—so outstanding that for 16 years more heavy-duty Internationals have served American commerce and industry than any other make.

In the *complete* International Line there's the right truck for every hauling job. And back of every truck is *specialized* International Service—supplied by the nation's largest company-owned truck-service organization, International Branches—and by International Dealers everywhere.

Yes, the new KB Internationals will be owned and driven with pride—with pride and profit—because these rugged trucks perform with unbeatable economy.

TRUCK OPERATORS!
For details of the 95 FEATURES AND IMPROVEMENTS in various models of the new KB Internationals, see your International Branch or Dealer.

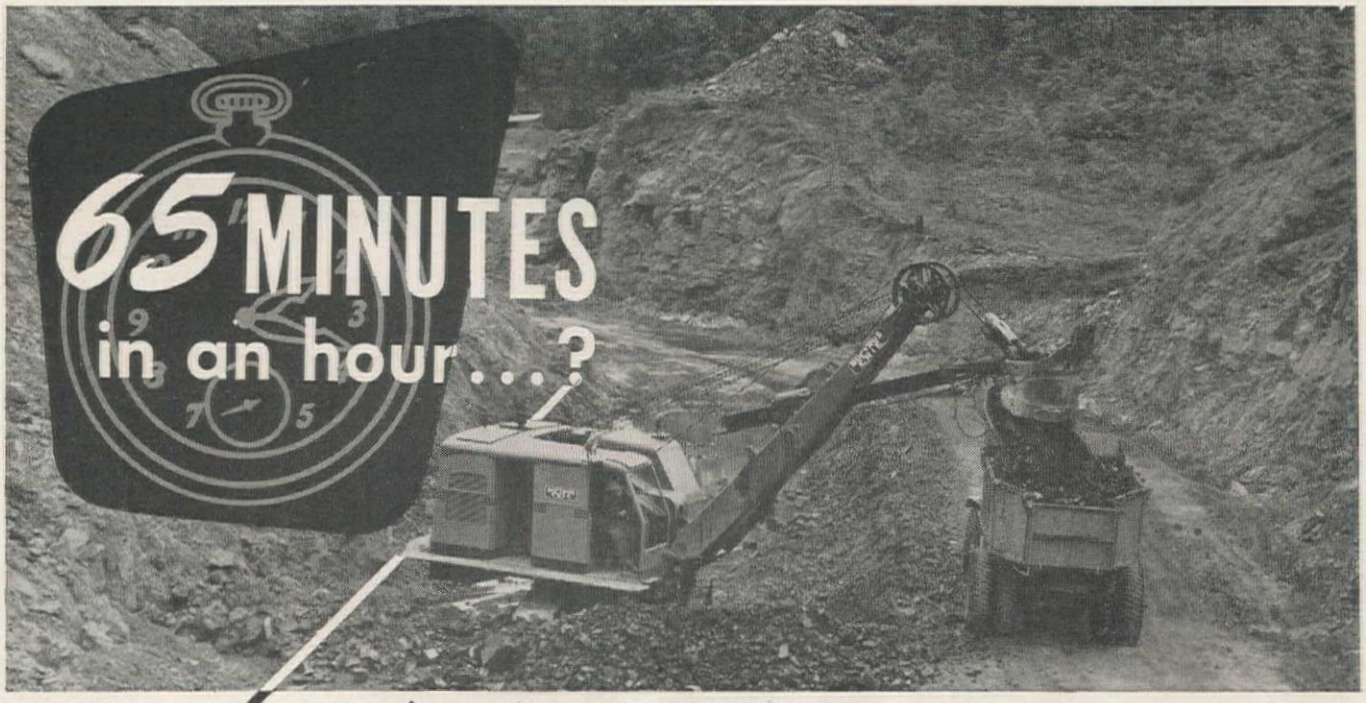
Motor Truck Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue, Chicago 1, Ill.

International Truck Branches located at San Diego, Los Angeles, West Los Angeles, Glendale, Fresno, Sacramento, Oakland, San Francisco, Portland, Tacoma, Seattle, Spokane, Salt Lake City, Denver, Cheyenne, Billings and Great Falls.

Tune in James Melton on "Harvest of Stars" every Sunday! NBC Network. See newspaper for time and station.

INTERNATIONAL

INTERNATIONAL *Trucks*



Obviously,

...no

But by taking advantage of the extra working time you get every hour of every shift with Bucyrus-Erie ⅜- to 2½-yard excavators, and measuring time in terms of output, you get a similar effect. With Bucyrus-Eries you "expand" each hour by saving time on:

ADJUSTMENTS, because they are all easy to make and last once you make them;

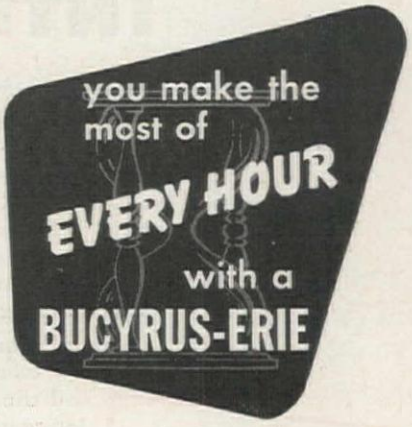
MAINTENANCE, because machinery arrangement is simple and accessible, and because balanced minimum-stress performance means few repairs;

LUBRICATION, because fittings are easy to reach, difficult to overlook;

MOVES, because the simple, efficient caterpillar mounting and the easy steering combine to permit fast maneuvering on the job;

OPERATING, because the controls give "full feel," are easily operated, and are all conveniently grouped so that the operator does not need to leave his position.

That means more time to put to work really outstanding digging ability — the result of design that combines the best performance features developed in Bucyrus-Erie's long experience in manufacturing excavators. Quickly convertible in the field, Bucyrus-Eries are equally effective as shovels, draglines, clamshells, or cranes. Bucyrus-Erie, South Milwaukee, Wisconsin. 56E46



SEE YOUR BUCYRUS ERIE DISTRIBUTOR EXC-2

SOULÉ EQUIPMENT COMPANY	Oakland — Sacramento
CROOK COMPANY	Los Angeles
CLYDE EQUIPMENT COMPANY	Portland — Seattle
INTERMOUNTAIN EQUIPMENT CO.	Boise — Spokane — Walla Walla
THE LANG COMPANY	Salt Lake City
THE O. S. STAPLEY COMPANY	Phoenix
R. L. HARRISON COMPANY, INC.	Albuquerque
BROWN MOTORS	Reno

Shovels • Dragshovels • Draglines • Clamshells • Cranes • ⅜ to 2½-yd.

Don't get caught with your lines down . . .

KEEP AN EXTRA REEL ON HAND AND BE SURE IT'S *Tiger Brand*

To make money in the construction business you've got to keep your equipment in operation. And to keep machines busy, you need an *extra good* line to start with . . . and an *extra good* line ready for quick replacement. That's why you see U·S·S American TIGER BRAND around so many successful jobs.

Made to close manufacturing tolerances and unvarying quality standards, easy-to-handle TIGER BRAND has the stamina to stand up *tirelessly* under the most gruelling conditions. Of Excellay Preformed construction, it is as strong and tough as any wire rope you can buy at any price. Put this better wire rope on your equipment and see for yourself why the Big Demand is for TIGER BRAND.

IMMEDIATE DELIVERY!

in any quantity. Now available in most types and sizes. Write, wire or call your nearest supplier. Anticipate your needs and stock up now. Don't get caught with your lines down.

Excellay Preformed

COLUMBIA STEEL COMPANY
San Francisco · Los Angeles · Portland
Seattle · Salt Lake City

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York

Tennessee Coal, Iron & Railroad Company, Birmingham,
Southern Distributors

United States Steel Export Company, New York

UNITED STATES STEEL

The BIG Demand is for Tiger Brand

Macwhyte Wire Ropes include: MACWHYTE PREformed and Non-PREformed Internally Lubricated Wire Ropes . . . MONARCH WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . Stainless Steel Wire Rope . . . Monel Metal Wire Rope . . . Galvanized Wire Rope. Macwhyte also makes Atlas Braided Wire Rope Slings, Hi-Fatigue Aircraft Cables, Assemblies, Tie-Rods. Catalogs on request.

a thousand and one...

MACWHYTE WIRE ROPES...

all job-proved . . . assure you the correct rope for your equipment

When you use the correct wire rope, both the rope and your equipment last longer, cost less to operate. Macwhyte consulting engineers will check your equipment and recommend the wire rope specifically engineered for your job. Ask your Macwhyte distributor, or write Macwhyte Company.

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.

NO. 892

Make MACWHYTE your headquarters for WIRE ROPES

GET 3-way PROTECTION with WINSLOW OIL CONDITIONERS

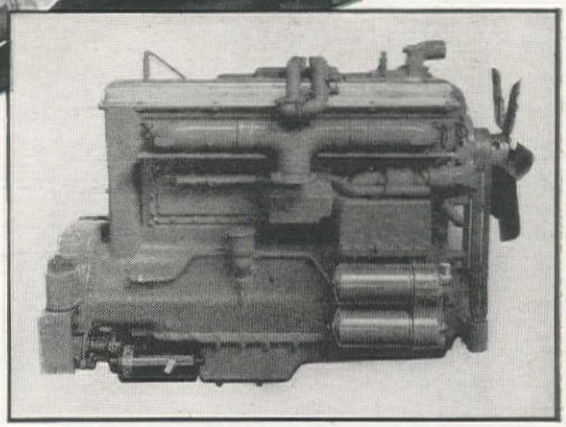
1 REAL CONDITIONING begins with the water-repellent surface which stops most moisture. Within the element, residue moisture is absorbed; corrosive acids are *neutralized;* gums, resins and varnishes are removed.

2 THOROUGH FILTRATION is accomplished by ingenious design features. Entire outside surface filters the oil, stopping large particles. Smaller grit is trapped as filtering channels narrow toward center, making full use of capacity. Winslow Elements do not remove the beneficial additives from modern compounded lubricating oils.

3 FULL-FLOW oil conditioning, pioneered and perfected by Winslow, allows only *conditioned* oil to reach wearing surfaces, brings oil into more frequent contact with elements for quicker removal of impurities. Fill out and mail the coupon today for details.

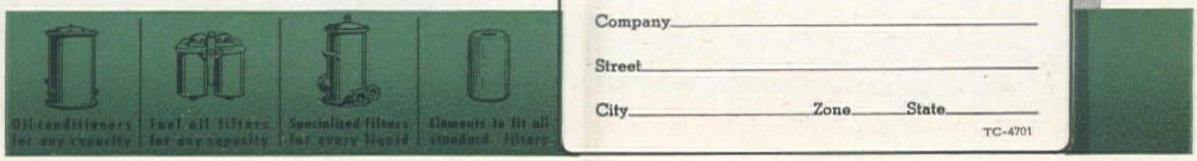
You incur no obligation by asking Winslow engineers to make recommendations on any problem of filtering liquids of any nature.

Winslow makes over 100 complete units and over 200 different sizes and types of replacement elements.



● To afford bearings full protection under toughest trucking conditions, these Hall-Scott Model 400 heavy duty 250 hp. engines are designed for Winslow full-flow oil conditioning.

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, more information and descriptive bulletins on the complete line of Winslow Fuel Filters and Lube Oil Conditioners.

Name_____

Company_____

Street_____

City_____ Zone____ State_____

TC-4701

Always Remember!

A TRUCK THAT FITS THE JOB DOES A BETTER JOB!

YOUR truck will do a *better* job—and do it more economically—when it is engineered and built *to fit the job.*

To give you a truck that will do a better job—with *your* loads over *your* roads—Dodge has a range of 175 "*Job-Rated*" chassis models. Your "*Job-Rated*" truck will have the *right one* of 7 different engines—to give it ample, yet economical power. It will have the *right one* of 5 clutches, 4 transmissions, 18 rear axles—it will have the *right* unit throughout to give you maximum economy and long-lasting dependability.

Ask your Dodge dealer to show you a truck "*Job-Rated*" for *your* job. BUY that truck—and you will have made the best and most profitable transportation investment on the market today.

DODGE DIVISION OF CHRYSLER CORPORATION

DODGE

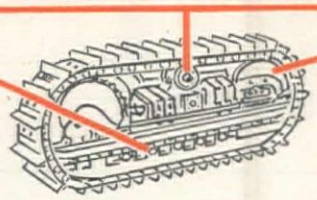
ONLY DODGE BUILDS "Job-Rated" TRUCKS

Fit the Job . . . Last Longer!

ALLIS-CHALMERS *First again*

NOW WITH 1000 HOUR LUBRICATION

TRUCK WHEELS **SUPPORT ROLLERS** **TRUCK IDLERS**



"GOODBYE" to old-fashioned, expensive time-consuming tractor maintenance methods.

NOW . . . truck wheels, idlers and support rollers on all Allis-Chalmers tractors are GREASE-PACKED at the factory. Thereafter the lubricant needs only to be replenished (not replaced) once every *1000 hours*. Get that . . . ONCE IN SIX MONTHS on a 40-hour week basis. This maintenance innovation was made possible by taking full advantage of the improved positive seal, exclusive in A-C tractors.

Here's what it means to you. It relieves you of the responsibility of frequent lubricating attention . . . results in less down time for greasing or repairs . . . reduces lubricant cost . . . adds a factor of safety by assuring adequate lubrication for long periods. Consequently, your maintenance costs are reduced and your tractor operating life extended.

For the full story of this and other features which make Allis-Chalmers the fast, sustained production tractor, talk to your Allis-Chalmers dealer.

With Allis-Chalmers' 1000-hour truck assembly lubrication, operator can select convenient time and spot when re-greasing is due. The HD-7 shown above, owned by Wayne Boulster, is operating in the California redwoods at Arcata.

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

a man's a giant

with a

BARCO

Barco is the accepted tool on thousands of hurry-up jobs all over the world. Foremen know that a worker gets powerful muscles of steel when you team him with a Barco Portable Gasoline Hammer. He works harder and faster with this tireless tool. The toughest going—even in hard-to-reach spots—becomes easy. Eleven special attachments make a Barco useful on dozens of *different* jobs.

BREAKING • DRILLING • DRIVING • TAMPING

BARCO

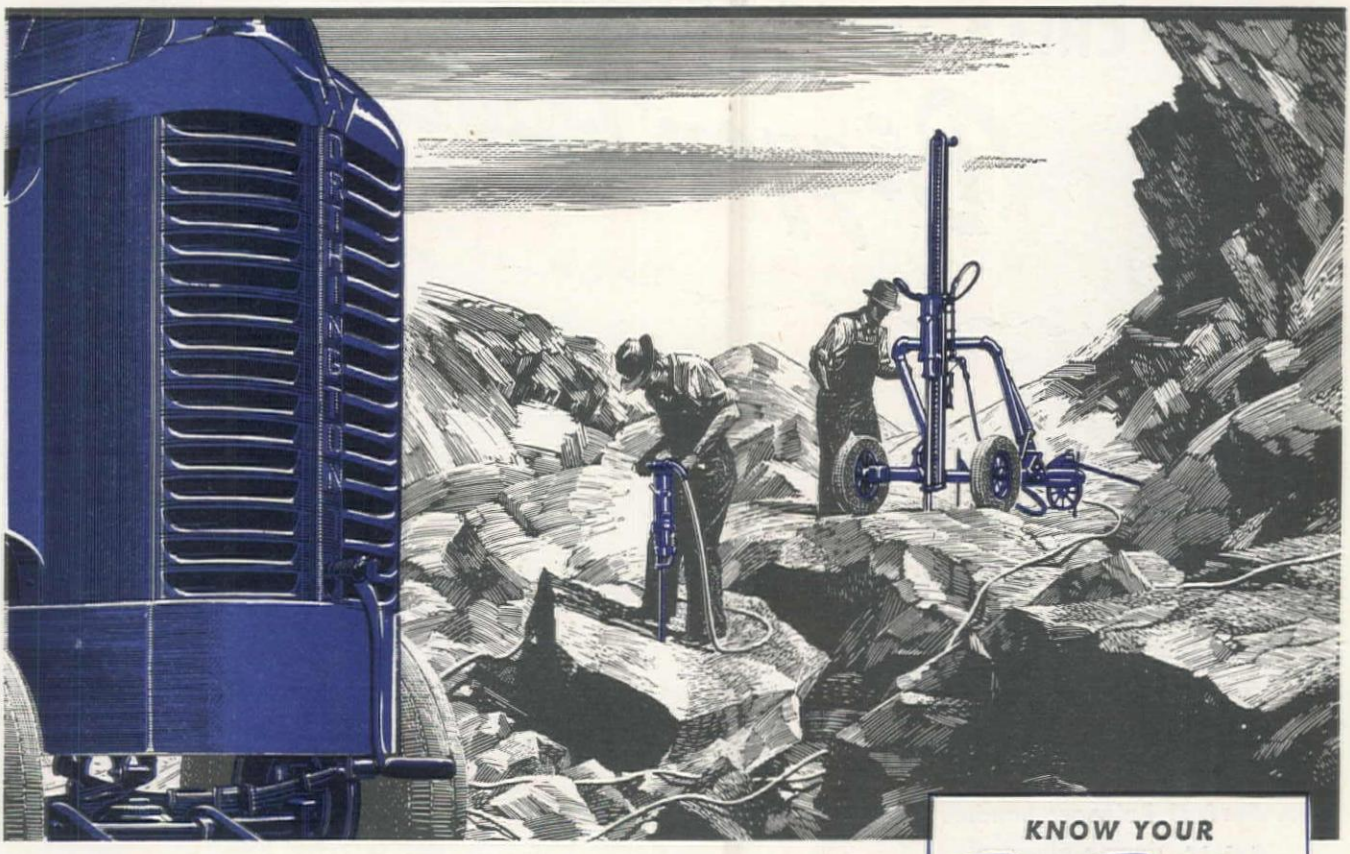
PORTABLE GASOLINE HAMMERS

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

BARCO MANUFACTURING CO., NOT INC., 1819 WINNEMAC AVENUE, CHICAGO 40, ILLINOIS

IN CANADA: THE HOLDEN CO., LTD., MONTREAL, CANADA

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 be glad to show you how Worthington-Ransome construction equipment will put your planning on a profitable basis.

RANSOME EQUIPMENT

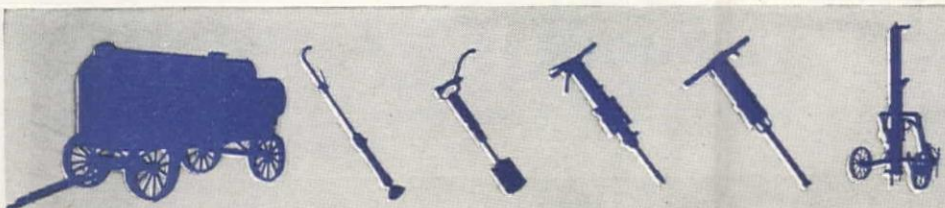
Pavers, Portable and Stationary Mixers, Truck Mixers, Pneumatic Placing and Grouting Equipment and Accessories.

WORTHINGTON EQUIPMENT

Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Self-Priming Centrifugal Pumps and Accessories.

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.

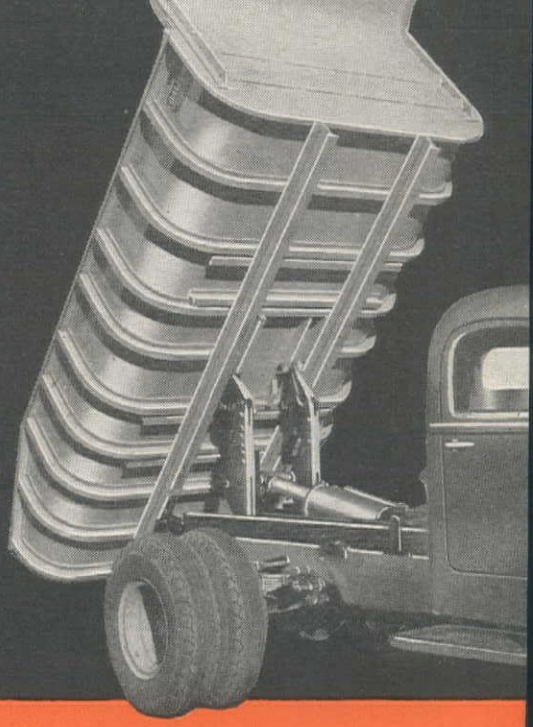
WORTHINGTON

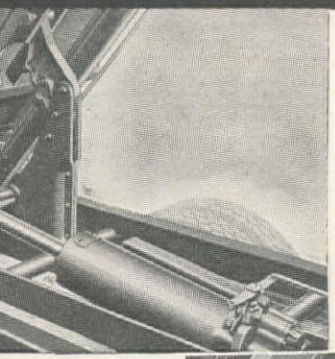
Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division Holyoke, Mass.

GED, POWERFUL, LONG-LIFE

GALION Allsteel

HYDRAULIC DUMP BODIES FOR ALL HAULING JOBS





GH-56

A powerful hoist with the patented equalizing lift feature for 8′ bodies with capacities from 2-1/2 to 3 yds.

H-58

od, heavy duty
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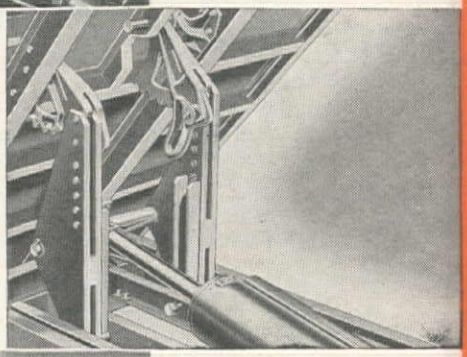
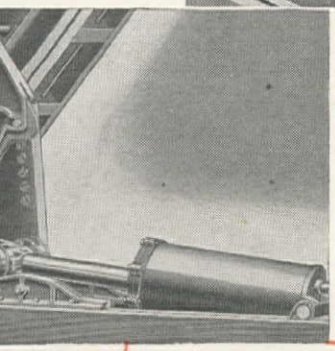
y up to 12





GH-60

Super heavy duty hoist for all classes of service. Easily handles bodies from 9′ to 16′ in length and payloads from 10 to 25 tons.

RATING	CYLINDER SIZE	GROUND CLEARANCE	MOUNTING HEIGHT
5 Tons	6-5/32" dia.	34"	13"
7 Tons	7-5/32" dia.	34"	13"
7-1/2 Tons	6-5/32" dia.	33" to 45"	Std. 14"
9 Tons	7-5/32" dia.	33" to 45"	Low 8"
10 Tons	O'size 7-5/8" dia.	33" to 45"	14"
12 Tons	O'size 8-5/8" dia.	33" to 45"	14"
15 Tons	10"dia.	33" to 45"	14"

Model 9—Reinforced plain side body with full length running boards and box type front and rear corner posts.

Model 12—Contractor's heavy duty body with running boards and pyramid side braces for extra strength.

Model CX-6—All purpose body with removable sides and rear corner posts. Double acting endgate drops flush with floor.

Model 3—Flared side to permit crowning of load. 75 cubic feet coal body. Front end built high to protect cab. 10 gauge high carbon steel, one piece construction.

Model 6—All purpose body with removable sides to make stake or platform body. Endgate posts either welded or bolted.

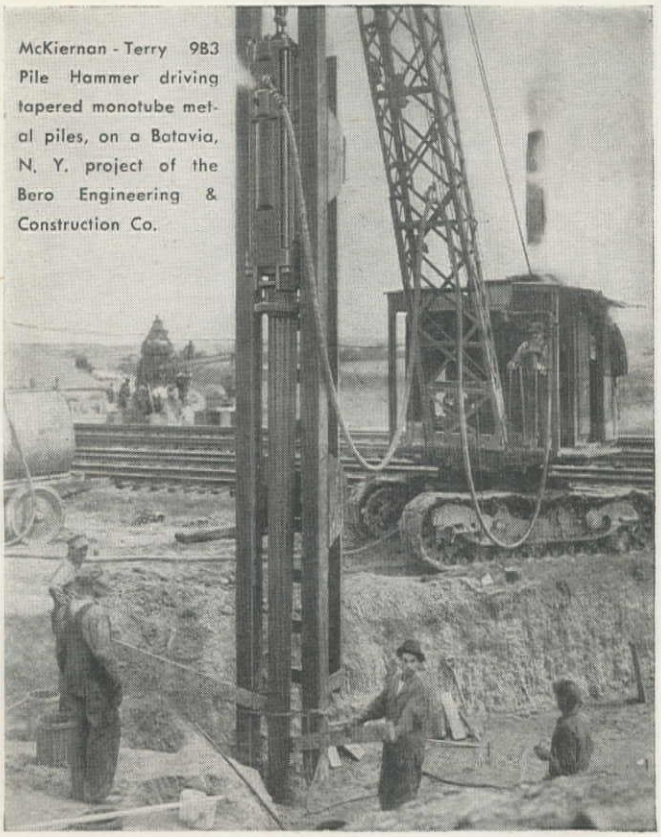
Model 5—Scow type garbage body with smooth welded seams. Body is water tight. Capacities 2 to 3 cubic yards. Tarpaulin rings furnished when specified.

Model 2—Plain side body for general hauling. 10 gauge high carbon steel, one piece construction.

Model 8—Straight side coal body. 75 to 128 cubic feet capacities. High head and endgate permit use of side boards to add 45 cubic feet capacity.

For more information on Galion's complete line of hoists and bodies from 1 to 25 cu. yds. write . . .

GALION *Allsteel* BODY COMPANY • GALION, OHIO, U. S. A.



McKiernan - Terry 9B3 Pile Hammer driving tapered monotube metal piles, on a Batavia, N. Y. project of the Bero Engineering & Construction Co.

EQUIPPED FOR ANY PILE DRIVING PROBLEM

PILING material may vary, soil to be penetrated varies greatly, location and working conditions are rarely twice the same. But McKiernan-Terry Pile Hammers are found always ready with the necessary power and dependability, in right sizes, and with every needed attachment for handling any type of pile driving job.

Embodying the widely varied experience of more than forty years of designing, manufacturing and installing pile driving equipment, McKiernan-Terry Pile Hammers have become the standard of choice by leading engineers and contractors.

Available in a complete line of ten double-acting and five single-acting hammers, and two double-acting extractors. Extensive facilities of two large plants at Dover, N. J., and Harrison, N. J., assure prompt deliveries.

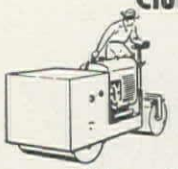
WRITE FOR FREE BULLETINS

Full information, specifications, photos, diagrams, etc., on double and single-acting hammers. Ask for Bulletins 55 and 57. Send today.

McKiernan-Terry
CORPORATION
Manufacturing Engineers
16 PARK ROW NEW YORK 7, N. Y.

THE New WHEELER TANDEM R

Easy Shift



Clutch is Mechanically Linked to Single Lever . . . Movement of Few Inches, Fo Backward, Moves Roller Sm

Without shock or chatter, smooth, effortless s forward or reverse is accomplished through a mounted lever within easy reach of the operator

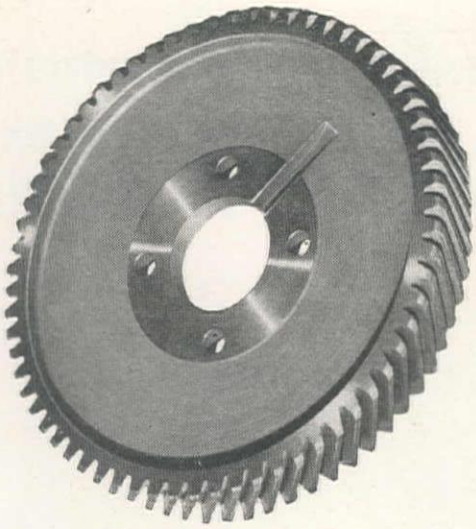
This convenient control is only one of the many of this new Wheeler Tandem 3 to 4-ton roller. F the heavy power unit and close-hung frame allow center of gravity. High ground and curb clearan as close side clearance, makes close work possible. surfacing rolls are machine-finished to assure sm ing results.

Now available through dealers, this new Whe roller will guarantee more efficient operation and tenance cost. Write today for the name of your

Close-up, showing ease of working close to

NEW WHEELER ROLLER DEALERS ARE: **CALIFOR Equipment Co., Oakland; Moore Equipment Co Fresno Equipment Service Inc., Fresno; WASHING Cox & Co., Seattle; OREGON: Clyde Equipment C UTAH: Cate Equipment Co., Salt Lake City; NE Bud Fisher Co., Albuquerque.**

NATIONALLY DISTRIBUTED BY: **Shaw Sales & S 5100 Anaheim-Telegraph Road, Los Angeles 22,**



This is a truck timing gear.

It is different from the timing gears in any other truck.

It is tetrapoid in form, for greater strength. It is drop-forged, case-hardened and generator-ground. It is made in our own shops.

We've been putting such timing gears in Mack trucks for 33 years. Not one of them has ever had to be replaced because of wear.

Every part that goes into a Mack truck is as honestly made, as thoughtfully designed for its own big or little job, as this unique timing gear.

That is what makes a Mack a precision-built truck and not a mass-production truck.

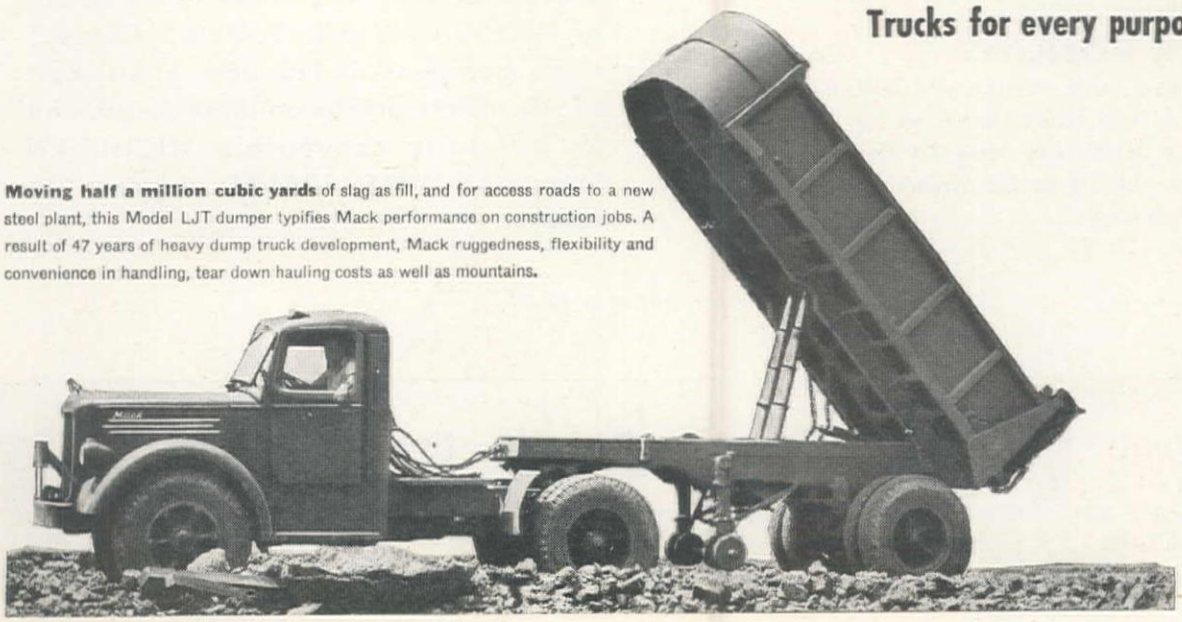
It is as simple as this: You get more work out of a Mack because we put more work into it.

Mack-International Motor Truck Corp.
Los Angeles, Sacramento, San Francisco, Seattle, Portland, Salt Lake City.
Factory branches and dealers in all principal cities for service and parts.

Mack since 1900, America's hardest-working truck

Trucks for every purpose

Moving half a million cubic yards of slag as fill, and for access roads to a new steel plant, this Model LJT dumper typifies Mack performance on construction jobs. A result of 47 years of heavy dump truck development, Mack ruggedness, flexibility and convenience in handling, tear down hauling costs as well as mountains.



4 REASONS WHY

Wendling Bros. Co., General Contractors, Dover, Ohio, are enthusiastic about their MICHIGAN Mobile SHOVEL-CRANE

SPEED AND ECONOMY: " . . . average daily fuel consumption is 20 gallons of gasoline . . . 600 yards of material loaded or unloaded per day and with clam we can excavate average of 400 yards per day. With trench hoe, 500 to 700 feet of of trench can be opened, depending on depth of ditch."

OPERATING EASE: " . . . Air Controls make this machine one of the easiest to operate."

TRUCK MOBILITY: " . . . Because of the ease with which MICHIGAN can be moved, we have worked on 5 different jobs in one day due to the fact that it can travel 30 to 35 miles per hour over the highway."

VERSATILITY: "We have used this machine for pile driving, dredging creeks, bridge building, setting steel, loading strip steel in 5 to 10 ton bundles and in one instance lifting a piano and putting it into an upstairs window."

• • •

Wherever you go, you'll find long-time owners lavish in their praise of the ability of MICHIGAN Mobile SHOVELS-CRANES to do more work in less time, at less cost . . . Complete details on these ⅜ yd. and ½ yd. fully convertible MICHIGAN Mobile SHOVELS-CRANES is yours on request.

Ask for Bulletin W-27.

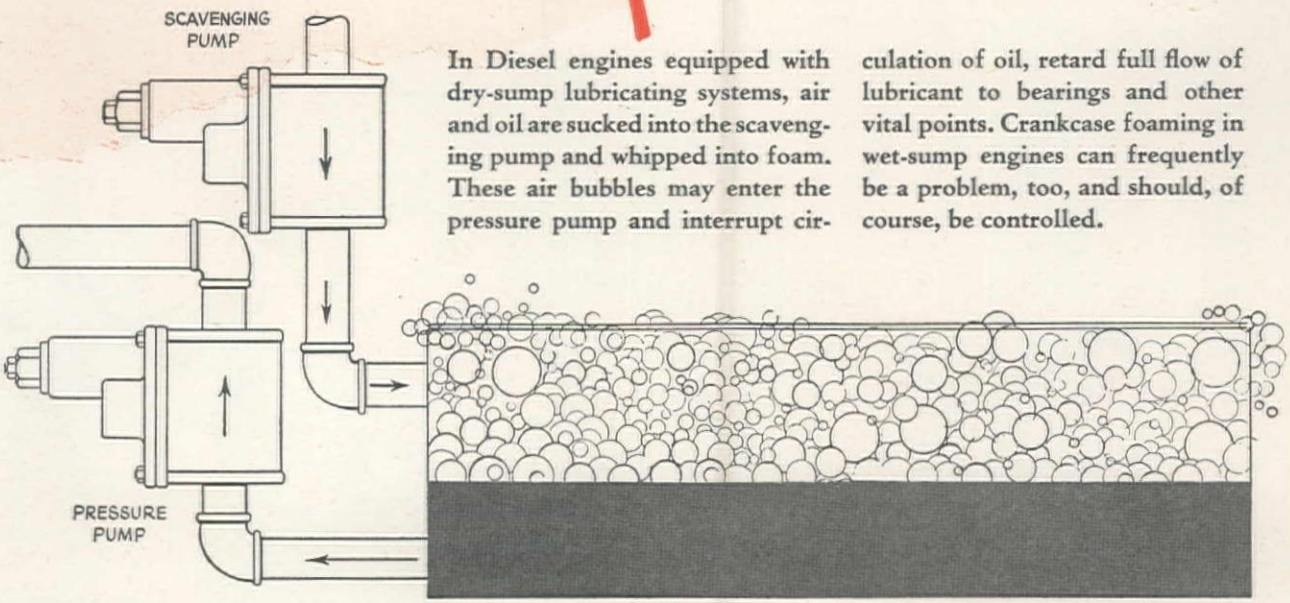
MICHIGAN

POWER SHOVEL COMPANY

BENTON HARBOR, MICHIGAN

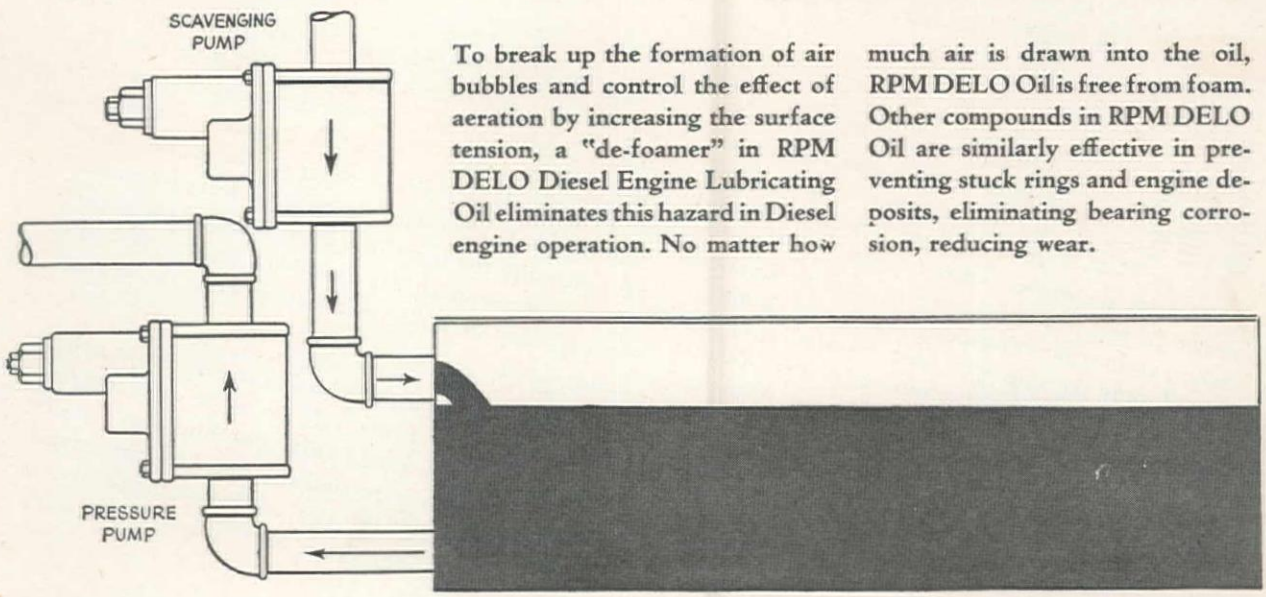
Diesel Engine DANGER points

AIR BUBBLES ENDANGER OIL CIRCULATION



In Diesel engines equipped with dry-sump lubricating systems, air and oil are sucked into the scavenging pump and whipped into foam. These air bubbles may enter the pressure pump and interrupt circulation of oil, retard full flow of lubricant to bearings and other vital points. Crankcase foaming in wet-sump engines can frequently be a problem, too, and should, of course, be controlled.

RPM DELO OIL PREVENTS CRANKCASE FOAMING



To break up the formation of air bubbles and control the effect of aeration by increasing the surface tension, a "de-foamer" in RPM DELO Diesel Engine Lubricating Oil eliminates this hazard in Diesel engine operation. No matter how much air is drawn into the oil, RPM DELO Oil is free from foam. Other compounds in RPM DELO Oil are similarly effective in preventing stuck rings and engine deposits, eliminating bearing corrosion, reducing wear.

To match the fine performance of RPM DELO OIL, use these equally efficient companion products from the same famous "RPM" line – RPM HEAVY DUTY MOTOR OIL – RPM COMPOUNDED MOTOR OIL – RPM GEAR OILS AND LUBRICANTS – RPM GREASES.

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help – make your maintenance job easier. Call your local Standard Representative or write STANDARD OF CALIFORNIA, 225 Bush St., San Francisco 20, Calif.

DIESEL ENGINE RPM DELO LUBRICATING OIL

PROFIT TIP . . .

Use whatever TRACTORS you like

When it comes to buying tractor-scraper rigs, remember *it's the scraper that controls the "payload."* And as every experienced dirtmover knows, there's a big difference in the performance of various scrapers under varying job conditions. Moreover, a difference of only 5 yards per hour, figured over the operating life of a scraper, can easily mean *60,000 yards of "pay dirt"—gained or lost—at your own bid price!*

That's why you'll find more and more smart dirtmovers buying their scrapers *entirely independent of the tractor* and holding out for job-proved LaPlant-Choate "Carrimors." Why LPC? Because operating records on hundreds of jobs prove conclusively that LaPlant-Choate rigs deliver *highest average production at lowest overall cost.* For one thing, they get bigger loads faster and easier in *all kinds of materials.* They also gain time traveling to and from the fill because they're free of costly dead weight. And when it comes to spreading—man, there isn't a scraper on the market that can match LaPlant-Choate *positive* forced ejection for cleaning the bowl in a hurry because *the apron moves ahead with the load*—no chance of jamming sticky or bulky material between the ejector and apron.

But that's only part of this interesting profit story. For complete facts call or write your nearest LaPlant-Choate dealer today. See him also for dependable repair parts and prompt, efficient service on your present LPC rigs. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th Ave., Oakland 3, Calif.

LaPLANT-CHOATE

Positive FORCED EJECTION SCRAPERS

FIRST in Value because they're FIRST in Performance!

FOR TRACTOR-SCRAPER BUYERS!

. . but be sure you get LaPLANT-CHOATE SCRAPERS

for best results under the most conditions

Get the facts
From your nearest
LaPLANT-CHOATE
Dealer

INDUSTRIAL EQUIPMENT COMPANY
SAN FRANCISCO • OAKLAND • LOS ANGELES
RENO • SACRAMENTO • FRESNO • SAN DIEGO
PHOENIX

COLUMBIA EQUIPMENT CO.
PORTLAND SEATTLE
BOISE SPOKANE

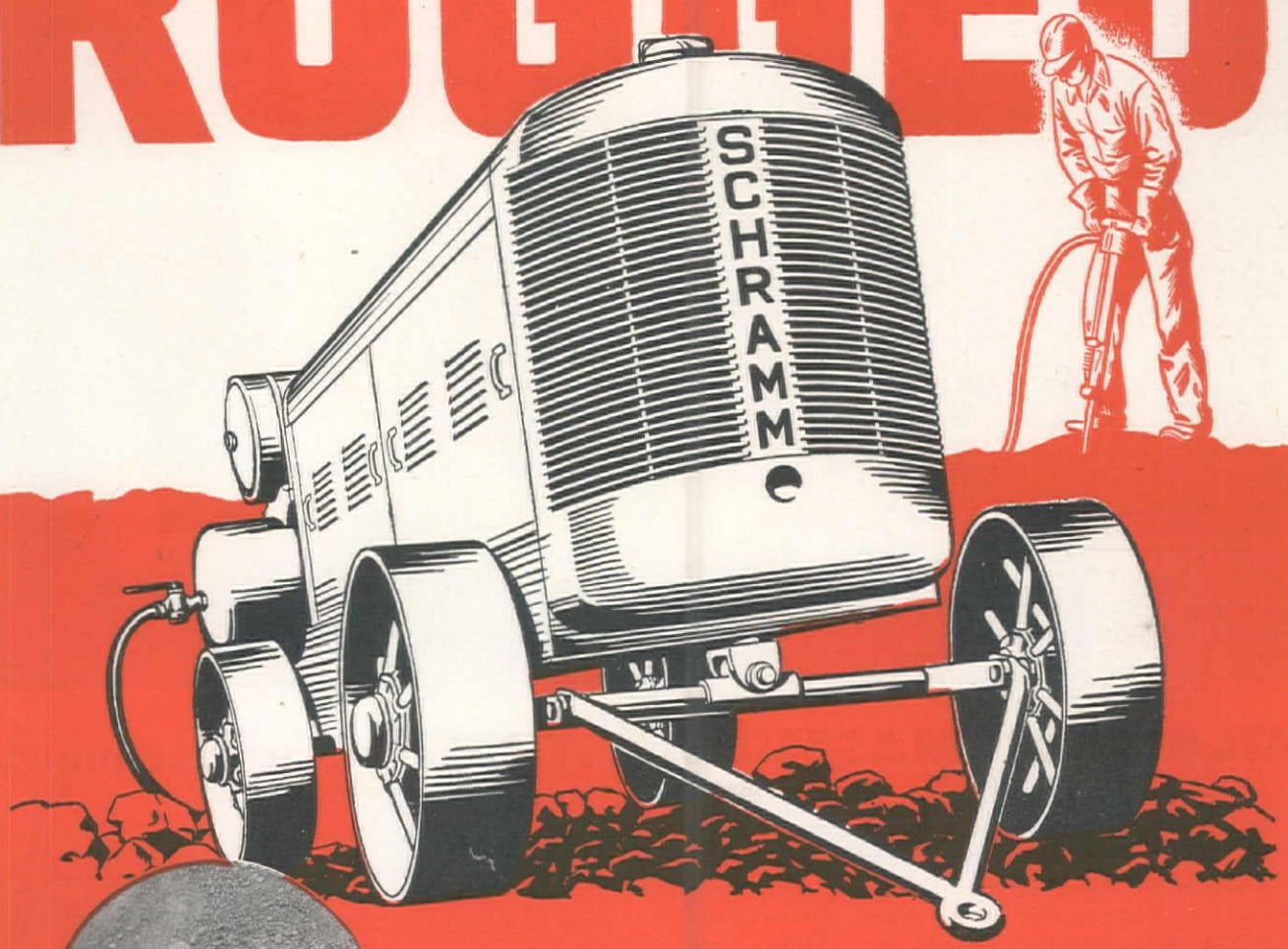
WESTERN CONSTRUCTION EQUIPMENT CO.
505 N. 24th Street
BILLINGS, MONTANA
218 W. Pine Street
MISSOULA, MONTANA

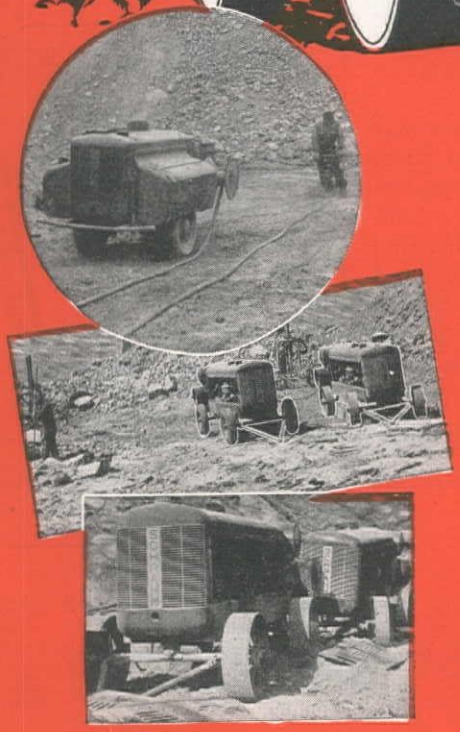
HEINER EQUIPMENT & SUPPLY CO.
501 W. Seventh Street South
SALT LAKE CITY, UTAH

LIBERTY TRUCKS & PARTS CO.
690 Lincoln St.
DENVER, COLORADO

WESTERN STATES WELDING & PRESS CO.
1304 North Fourth St.
ALBUQUERQUE, NEW MEXICO

RUGGED





Of course, they're rugged! Every Schramm Portable Compressor is built to stand up on the toughest quarry jobs year in and year out. 100% water cooling guarantees safe operation in any climate, no matter how warm or how cold. Look at just a few of the other features that assure long, trouble-free operation: (1) Main bearings for every cylinder, (2) mechanical intake valve, (3) more cylinders and lighter parts, and (4) forced-feed lubrication to every moving part.

Whatever your compressed-air requirements—for one hand-held drill or wagon drill, or several of them, you'll be way ahead in operation and maintenance costs with a RUGGED Schramm Portable Compressor supplying the power.

Available in a variety of sizes—on wide-rimmed steel wheels or pneumatics, to fit your needs. For complete details send for Bulletin Q-44.

SCHRAMM INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

Split-Second Timing gets results . . .

ATLAS ROCKMASTER BLASTING has a scoring punch

In modern basketball winning scores are the result of teamwork based upon split-second timing. In modern blasting, too, an amazing control of timing is producing outstanding results for blasters all over the country.

Now the blaster is able to time the delay elements of his shot in thousandths of a second . . . a feat never before possible . . . and fragmentation has increased tremendously. While still under the strain of the first blast, the rock is hit again . . . a split-second later . . . with terrific impact. The results are astounding.

In dollars and cents, Atlas Rockmaster means money saved. Reports coming in from one blasting operation after another continue to tell of fragmentation increased as much as 30% . . . shovel efficiency stepped-up . . . secondary shooting cut down . . . and complaints due to noise and vibration held to a minimum.

Of course, split-second timing is not the only factor in a Rockmaster blast. For Atlas Rockmaster is a complete blasting system . . . not just a timing device. All factors of the blasting problem — detonators, explosive and loading — are taken into account and combined with your know-how and ours to produce true Rockmaster effectiveness.

To find out how Rockmaster can be made to work for you with outstanding results . . . call in your Atlas representative.

Manasite: Reg. U. S. Pat. Off. "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.

700,000 TONS
...and still going strong!

MADSEN ASPHALT PLANTS

OPERATING 12 MONTHS out of the year this Madsen Plant, owned and operated by Sparks & Mundo Eng. Co., has turned out 700,000 tons of asphalt-bound material without one day's shutdown due to repairs.

Mr. C. O. Sparks says, "We've produced 1500 tons per day many times during the continuous operation of our Madsen Plant."

The real test of an asphalt plant is continuous operation at high production speeds . . . and Madsen Plants have the speed, the stability and design to consistently perform at high speed—*it has been proved.* Learn about all the Madsen-exclusive features which assure faster mixing, sustained production and long life. See for yourself the advantages of the Madsen Asphalt Injection System, High-Speed Sectional Pug Mill, Unit-Power Transmission and many others; write for illustrated catalog.

MADSEN IRON WORKS
5631 Bickett St. • Huntington Park, Calif.

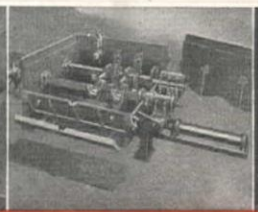
★ **C. O. SPARKS** of Sparks & Mundo Eng. Co., is a pioneer in the construction industry in California. His keen insight in asphalt plant operation and his 42 years of experience makes his active participation extremely important in the management of one of the largest businesses of its kind in Los Angeles. Mr. Sparks says, "We've ordered another 4,000-lb. Madsen Asphalt Plant just like the one we are now operating."

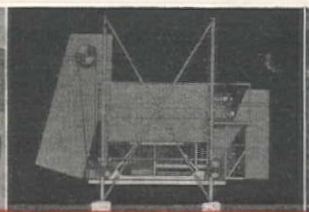
★ **35 YEARS** as a contractor, affiliated with the California construction industry since 1911, Mr. W. T. (Bill) Ellington is well known in the West. Bill's practical application of engineering to his company's operation has contributed greatly to the success of Sparks & Mundo Engineering Co. Mr. Ellington says, "We know from experience Madsen Plants will turn out as much as 30,000 tons per month without a single shutdown due to repairs."

Write for Catalog

MADSEN


Asphalt Pressure Injection System

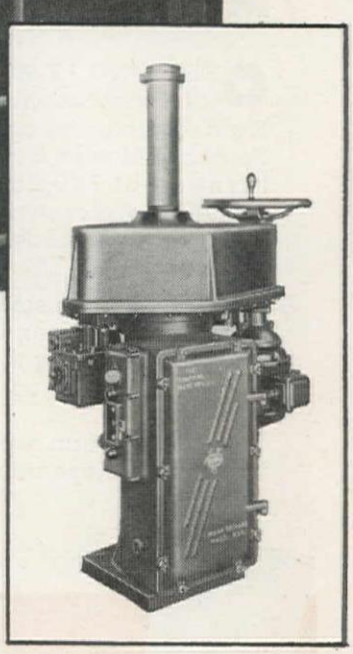

Sectional twin-shaft Pug Mill Mixer


Jack-Erection System and Power Lift


Overflow Bin for easy Truck Loading

DISTRIBUTORS: Birmingham, Ala., Armstrong Eq. Co.; **Des Moines, Iowa,** Herman M. Brown Co.; **Seattle, Wash.,** A. H. Cox & Co.; **Portland, Ore.,** Cramer Machy. Co.; **Albuquerque, N. M.,** Harry Cornelius Co.; **Houston, Tex.,** R. B. Everett & Co.; **Denver, Colo.,** Elton T. Fair Co.; **Omaha, Neb.,** Fuchs-Clayton Machy. Co.; **San Francisco, Cal.,** C. H. Grant Co.; **Atlanta, Ga.,** J. W. Grass Eq. Co.; **Chicago, Ill.,** Hillsman Eq. Co.; **Salt Lake City, Utah,** Landes Machy. Co.; **Seattle, Wash.,** Lomen Eq., Inc.; **Dallas, Tex.,** Martin Machy. Co.; **Spruce Pine, N. C.,** Mitchell Dist. Co.; **Phoenix, Ariz.,** Smith-Booth Usher Co.; **Lansing, Mich.,** Telford Eq. Co.; **Charleston, W. Va.,** W. Va. Tractor & Eq. Co.; **Minneapolis, Minn.,** Wm. H. Ziegler Co., Inc.

CHAPMAN
SLUICE GATES



May Be Operated by Hand, by Hydraulic Cylinder or Electrically Through Motor-Operated Floor Stand

Many types of sluice gates that once were "specials" are now included in the Chapman Standard Line. As a rule, you can usually find just what you want in this line; our engineers will be glad to work with you in all your problems.

Chapman Sluice Gates may be operated by hand, by hydraulic cylinder or electrically. The Chapman Motor unit (at right) is completely enclosed in a weatherproof housing—is delivered wired and ready to install. Handwheel is provided for emergency operation when power fails. Write for complete details.

THE CHAPMAN VALVE MANUFACTURING CO.
INDIAN ORCHARD, MASSACHUSETTS

SAW TILE

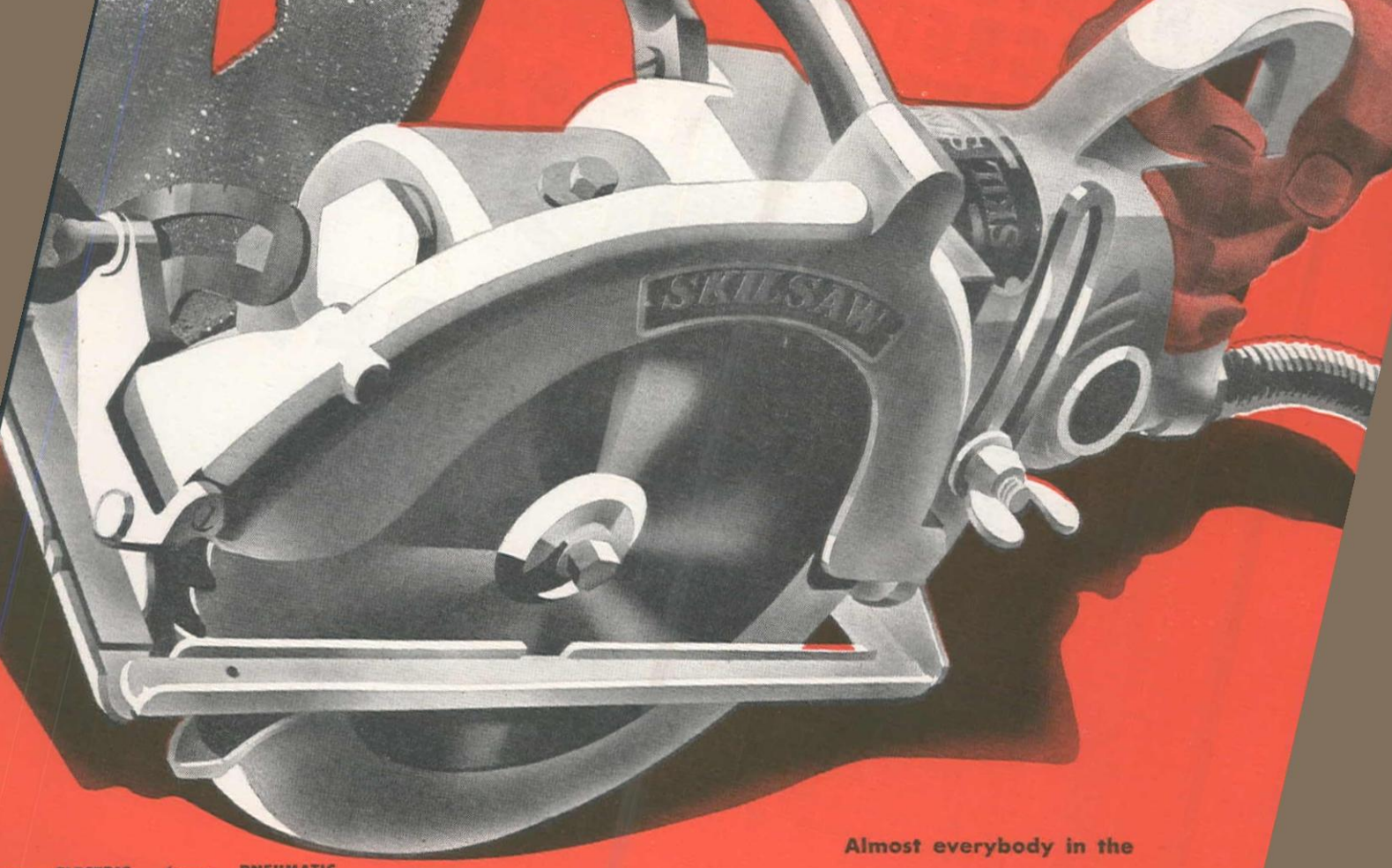
SAW METAL

SAW COMPOSITIONS

SAW STONE

BUT DON'T JUST SAW IT...

SKILSAW IT!



ELECTRIC PNEUMATIC

SKILTOOLS

MADE BY SKILSAW, INC.

Almost everybody in the building business knows that SKILSAW is the number one choice for making all cuts in wood. But do you know that SKILSAW cuts many other materials, too . . . even wired glass? See your distributor today about a demonstration.

SKILSAW, INC.
5033 Elston Ave., Chicago 30, Illinois
Factory Branches in Principal Cities

MANUFACTURED RIGHT IN YOUR *Own District*

REINFORCED CONCRETE CULVERTS *for*

STRENGTH- PERMANENCE-

With reinforced concrete culverts, you get all the lasting advantages of strength and durability and capacity, PLUS the extra advantage of prompt delivery ON the job—at the trench.

Reinforced culverts and sewer pipe are not only manufactured RIGHT—they're manufactured right in your own district by a member of the California Associated Concrete Pipe Manufacturers.

So you get strict compliance with the standard specifications of the American Society for Testing Materials and the American Association of State Highway Officials.

To make sure that the pipe you buy has all the advantages of CONCRETE at its BEST, write for specifications, literature and specific information on any problems. Ask for the names of YOUR nearest manufacturer-members of—

CALIFORNIA ASSOCIATED CONCRETE PIPE MANUFACTURERS

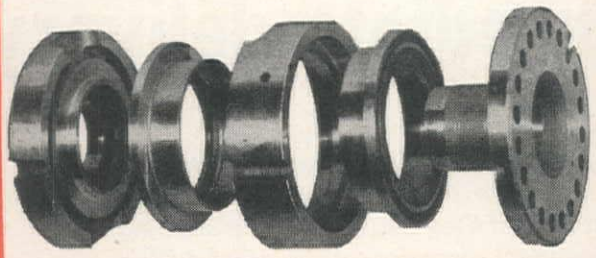
P.O. BOX 152 FRESNO 7 CALIFORNIA

MAKES TOUGH JOBS EASY!

DUAL VALVE

used exclusively on

SULLIVAN DRILLS



The exclusive Sullivan Dual Valve is a big factor in the outstanding efficiency of Sullivan Drills. It steps up drilling productivity because it *makes air do more work*. The Dual Valve provides positive air control on both strokes of piston, giving exact, "cushion control."

THE SULLIVAN LIGHTWEIGHT WAGON DRILL
Pneumatic tire equipped, positive locking brakes and adjustable frame . . . increases footage 50 to 80% with mounted 55 to 75 pound hand drills.

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ROCK DRILLS • WAGON DRILLS • COMPRESSORS

Consult a Joy Engineer

W&D R500

SULLIVAN DIVISION

JOY MANUFACTURING CO.

General Offices: Henry W. Oliver Bldg., Pittsburgh, Pa.

20 YD. DUMP TRUCK

Now available for immediate delivery

If you're looking for a BIG dump truck to move huge loads of dirt, rocks or ore, you've found it in the new Kenworth Model 888. This mammoth truck, with a gross capacity of 106,000 pounds, is one of the biggest, most rugged things you've ever seen on wheels.

The Kenworth Model 888 dump truck is equipped with a 20-yard water level, rock type body and a twin cylinder telescopic hoist with a dumping angle of 50 degrees. Design features include: an offset cab which provides exceptional driver visibility; the Knuckey dual chain drive bogey; either a 295 horsepower Hall-Scott gasoline or 200 horsepower Hercules diesel engine. Power steering is optional. Standard tires are 14.00 x 24 with 16.00 x 24's optional on the rear wheels.

A few of these huskies are ready for immediate delivery—more can be produced promptly. Wire or phone Kenworth Motor Truck Corporation, Seattle 11, Washington, for name of your nearest Kenworth distributor.

KENWORTH

TRUCKS ★ BUSES

FACTORY AND HOME OFFICE: SEATTLE • *DISTRIBUTORS IN* PRINCIPAL WESTERN CITIES AND HAWAII

WHERE THE GOING IS TOUGHEST

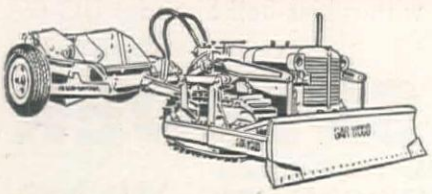
...SPECIFY GAR WOOD!

In use everywhere for clearing, leveling, grading, and excavating ...All Gar Wood Road Machinery is specifically designed, engineered, and built to make the *toughest* jobs *easy*...and more profitable.

That's a *fact*...for Gar Wood Bulldozers and Dozecasters are the result of practical, down-to-earth engineering. They're constantly being proven and reproven in the field...in mining, quarrying, lumbering, railroading, and general contracting.

Moving the four corners of the earth, rebuilding a war-torn world, Gar Wood Road Machinery has *got* to be good. For your next job...*particularly if it's a tough one*...specify Gar Wood.

GAR WOOD GW TRADE MARK INDUSTRIES



ARIZONA: Allison Steel Mfg. Co., 19th Ave. and So. Pac. Tracks, Phoenix; CALIFORNIA: Gar Wood Industries, Inc., 1210 Mateo St., Los Angeles 21; Gar Wood Industries, Inc., 17th and Folsom Sts., San Francisco 10; COLORADO: Liberty Trucks & Parts Co., 690 Lincoln St., Denver 1; IDAHO: Olson Mfg. Company, 4000 Warm Springs, Boise; General Machinery Co., E. 3500 Block, Riverside Ave., Spokane 1, Wash.; MONTANA: Reymer Machine Co., Inc., 115 N. 25th St., Billings; Granite Alaska Garage, 45 W. Granite St., Butte; NEW MEXICO: Oden Equip. Co., 312-24 N. 4th St., Albuquerque; Lone Star Equip. Co., 1500 Texas St., El Paso, Texas; OREGON: Fruehauf Trailer & Equip. Co., 1136 S. E. 10th St., Portland 14; UTAH: Lundberg Equip. Co., 257 N. Main St., Logan; Cate Equip. Co., 49 East 9th South, Salt Lake City 4; WASHINGTON: Fruehauf Trailer & Equip. Co., 300-4 Michigan St., Seattle 8; WYOMING: Wilson Equip. & Supply Co., 902 W. 22nd St., Cheyenne.

This Machine Sure "Gets Around"!

. . . SPEEDY TO THE JOB . . .
POWERFUL AND STEADY ON THE JOB!

IT'S THE LINK-BELT SPEEDER WHEEL-MOUNTED UC-55 "SHOVEL CRANE"

You get to the job quickly with a wheel-mounted Link-Belt Speeder UC-55 and when you get there, you get into operation quickly, with plenty of power, and a steady machine that handles a wide variety of operations. One-man operated, it travels at 10 m.p.h. on the highway, negotiates rough ground easily, and has four-wheel drive for heavy going.

Hydraulic stabilizers lock the oscillating front axle, compensating for uneven ground preventing tipping and taking strains off working parts.

Twin Disc Hydraulic Power take-off lengthens cable life and saves machine from shocks. Like all Link-Belt Speeders, it is quickly converted from shovel to crane, dragline, trench-hoe, pile driver, etc.

You'll go places in a hurry with a Link-Belt Speeder UC-55!

JUST TWO OF THE MANY JOBS YOU CAN DO WITH UC-55

DRIVING PILES ON BRIDGE REPAIRS

DITCHING WITH DRAGLINE

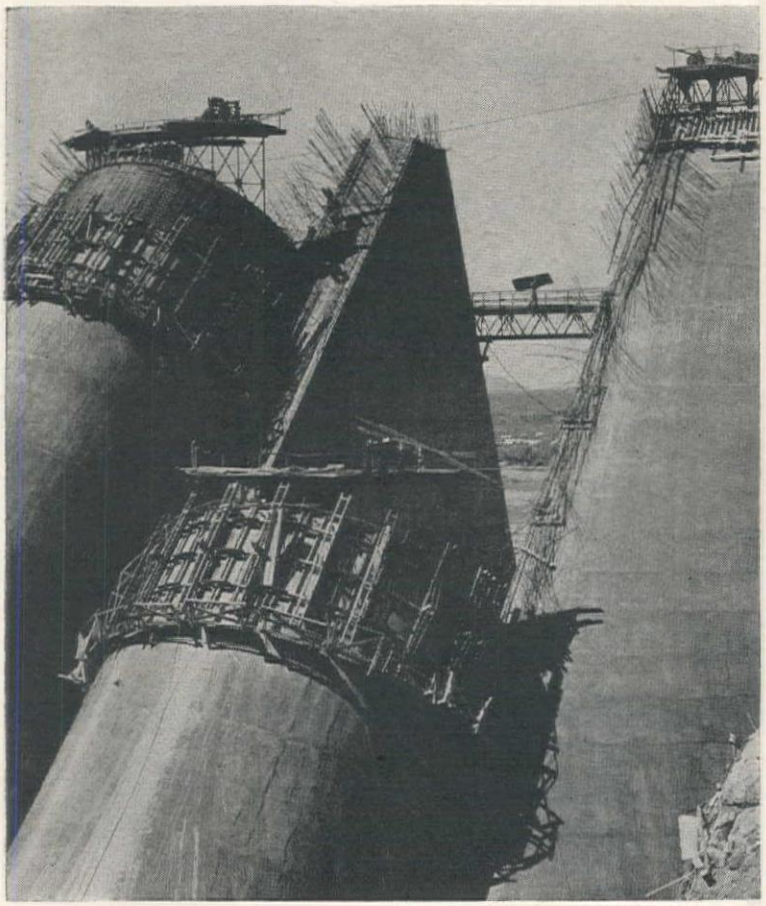
10,541

LINK-BELT SPEEDER

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

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

STEEL FORMS for Concrete Construction



Tapered arch forms used in constructing Arizona dam.

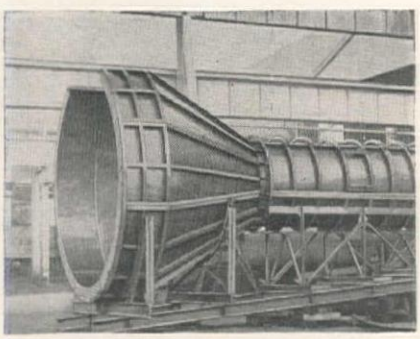
Designed and Engineered To Your Requirements

★ Steel forms, designed and engineered for the job, can greatly accelerate the pouring of concrete and lower construction costs. They also make it possible to work to a predetermined schedule; remove forms from concrete sooner, and cut handling time to the minimum.

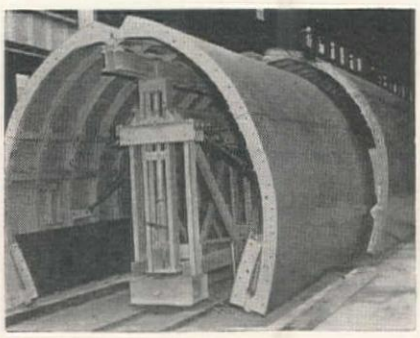
Western Pipe & Steel Company has for years been the source of steel forms in the West. Among the forms designed and fabricated by Western are: telescoping tunnel and conduit forms; tapered and standard arch forms; caisson, precast pile and wall forms.

★

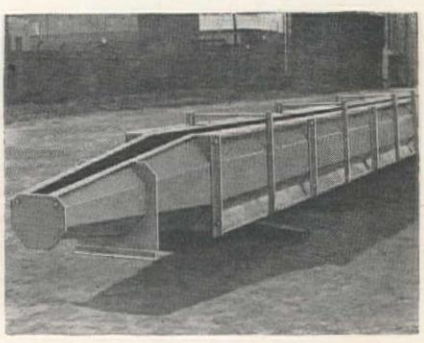
Steel forms are among the more than 300 different steel products fabricated by Western's five plants. Write your nearest Western office for detailed information.



CAISSON form designed for use in building pier for Navy Department at San Diego, California.



TELESCOPING forms used in tunnel and conduit construction have long been a Western specialty.



PRECAST concrete pile form used to make piles driven into foundation to support structure of dam.

WESTERN PIPE & STEEL COMPANY OF CALIFORNIA

Fabricators • Erectors

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5717 Santa Fe Ave., Los Angeles 54

200 Bush Street
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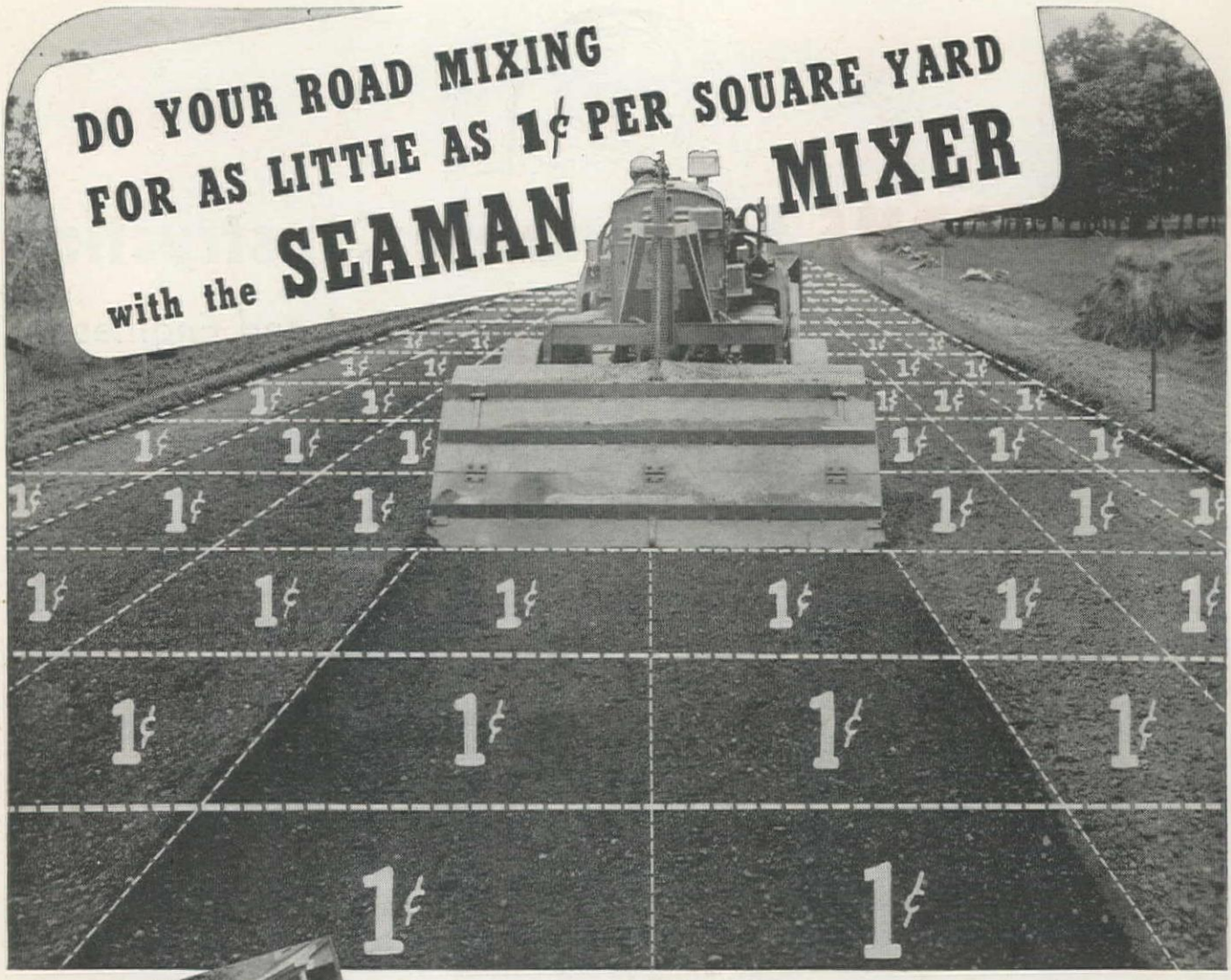
BAKERSFIELD, FRESNO, SOUTH SAN FRANCISCO, TAFT, CALIF.; PHOENIX, ARIZ.

DO YOUR ROAD MIXING FOR AS LITTLE AS 1¢ PER SQUARE YARD with the SEAMAN MIXER



Pocket size but packed with useful, practical facts,—the ever-popular "Soil Stabilization Methods,"—a book compiled by Seaman engineers. Yours on request,

Ask for Bulletin N-25

While costs of operating any mixing equipment vary according to the character of mixed materials, local labor rates and several other factors,—nevertheless, under reasonable conditions, careful cost analyses have repeatedly shown that the motorized SEAMAN MIXER—Model MHD-72, produces a thorough, uniform and intimate mix for as low a cost as one cent per square yard. Even under adverse conditions costs generally do not exceed 5 cents . And with the SEAMAN MIXER, low-operating cost is coupled with high daily output. One Model MHD-72, operating in conjunction with a motor patrol, will mix 100 tons an hour,—or operating with a 100 ton conventional travel plant, will double that capacity. Calculated on the basis of square yards,—the SEAMAN MIXER can be counted on for 5000 square yards in an eight hour day, in fact, under good operating conditions, Model MHD-72's have repeatedly turned out over 9000 square yards in 8 hours . . . What's more,—SEAMAN MIXERS represent a surprisingly small investment. Prices start as low as $869.00 F.O.B. Milwaukee.

SEAMAN MOTORS, Inc.

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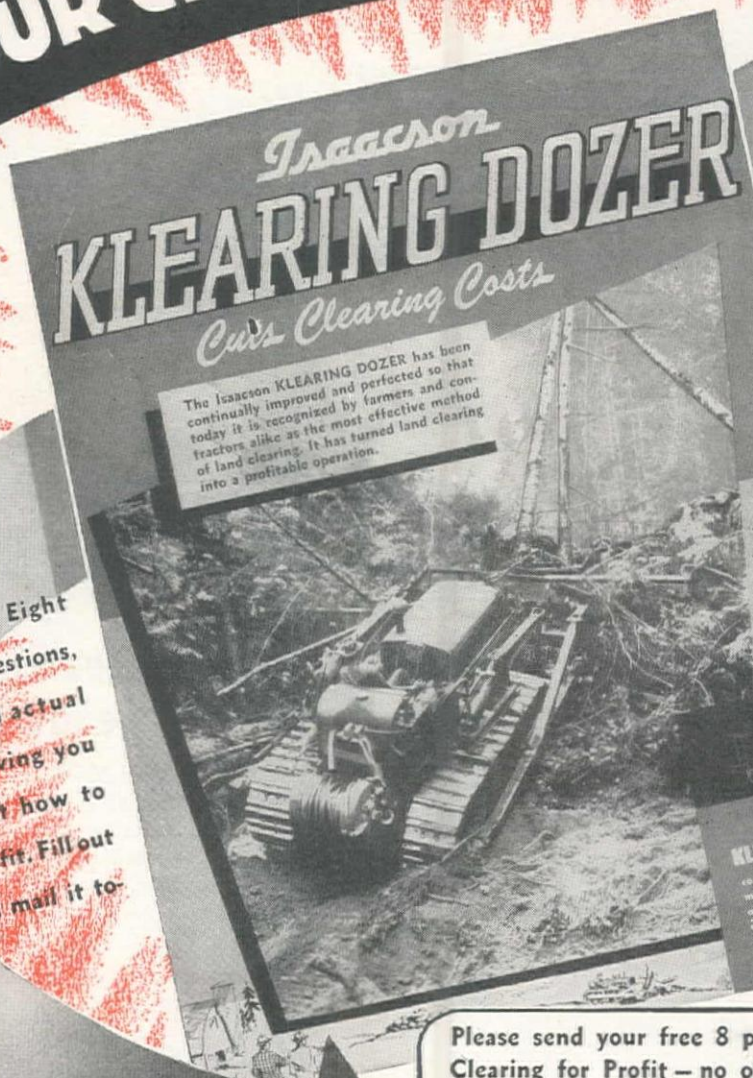
CONTRACTORS Reduce YOUR CLEARING COSTS 50%



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The SPOTLIGHT is still Focused on SMITH-MOBILE!

Check these PLUS VALUES:

Dual water system, heated for winter operation . . . Improved, easy-to-operate chute lifter . . . Rubber mounting for bearings and gear case . . . Quickly accessible clutches . . . Improved sealing door . . . Accurate syphon-type tank . . . complete, streamlined enclosure for greater safety.

Improved, Streamlined Models Now About Ready for Delivery

12 years ago, SMITH-MOBILE made its initial appearance as the industry's first HIGH DISCHARGE truck mixer and agitator. It displaced the old style, horizontal drum "hatch-loaders" and rendered them thoroughly obsolete.

Now — SMITH-MOBILE again increases its acknowledged leadership in the field with a record of achievement unparalleled in the industry. To its many time-tested features: HIGH DISCHARGE . . . CONTROLLED DISCHARGE . . . VISIBLE MIXING . . . FEED CHUTE CHARGING . . . etc., are now added many other important refinements that make for even greater speed, efficiency and safety in operation.

Built and guaranteed by SMITH . . . mixer manufacturers for more than forty-five years . . . SMITH-MOBILE is a thoroughly tried and proven product. At present, of course, the demand for this ultra-modern truck mixer greatly exceeds the supply. Deliveries, however, are being pushed ahead as rapidly as conditions permit. In the meantime, we suggest you write for new SMITH-MOBILE bulletin.

THE T. L. SMITH COMPANY

2871 N. 32nd Street — Milwaukee 10, Wis., U. S. A.

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

THE *Original* HIGH DISCHARGE TRUCK MIXER AND AGITATOR

Here's Inexpensive

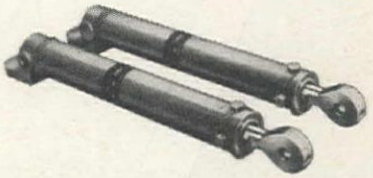
POWER

TO RAISE...LOWER...MOVE HEAVY LOADS ON YOUR EQUIPMENT

This is hydraulic power in its simplest terms, ready to work for you instantly.

The Bendix-Pacific Power Dome is an inexpensive hydraulic power package—pump, reservoir, integral relief valve and release valve housed in a dirt-proof body—which you connect *with a single pipe* to one or more rams. This combination can supply tremendous force to lift . . . lower . . . or move things. For example, a few strokes of the Power Dome handle can produce a working force of 20,000 pounds in the rams shown at right. Other applications can produce even greater force as required.

Power Dome on your equipment or machinery can do a job easier—and give your product a forceful new sales appeal. Early deliveries of Power Dome can be made. Bendix-Pacific engineers are available to advise with you on any application. Your inquiry is invited.



NEW TYPE STREAMLINED RAMS ARE MORE EFFICIENT, CHEAPER

Bendix-Pacific has developed these new type rams and cylinders to make them more compact, highly efficient and easily serviced. They are designed to fit your specific requirements. You get a better product, eliminate conversion expense and pay less than so-called "shelf merchandise." Write for details.

HYDRODYNE* POWER DOME Can Do These Jobs Easier

ACTUATE:

- ★ Farm Implements
- ★ Earth Moving Equipment
- ★ Snow Plows
- ★ Material Handling Equipment
- ★ Presses and Bending Machines
- ★ Hydraulic Test Equipment

*Registered U. S. Pat. Off.

PRODUCT OF Bendix AVIATION CORPORATION

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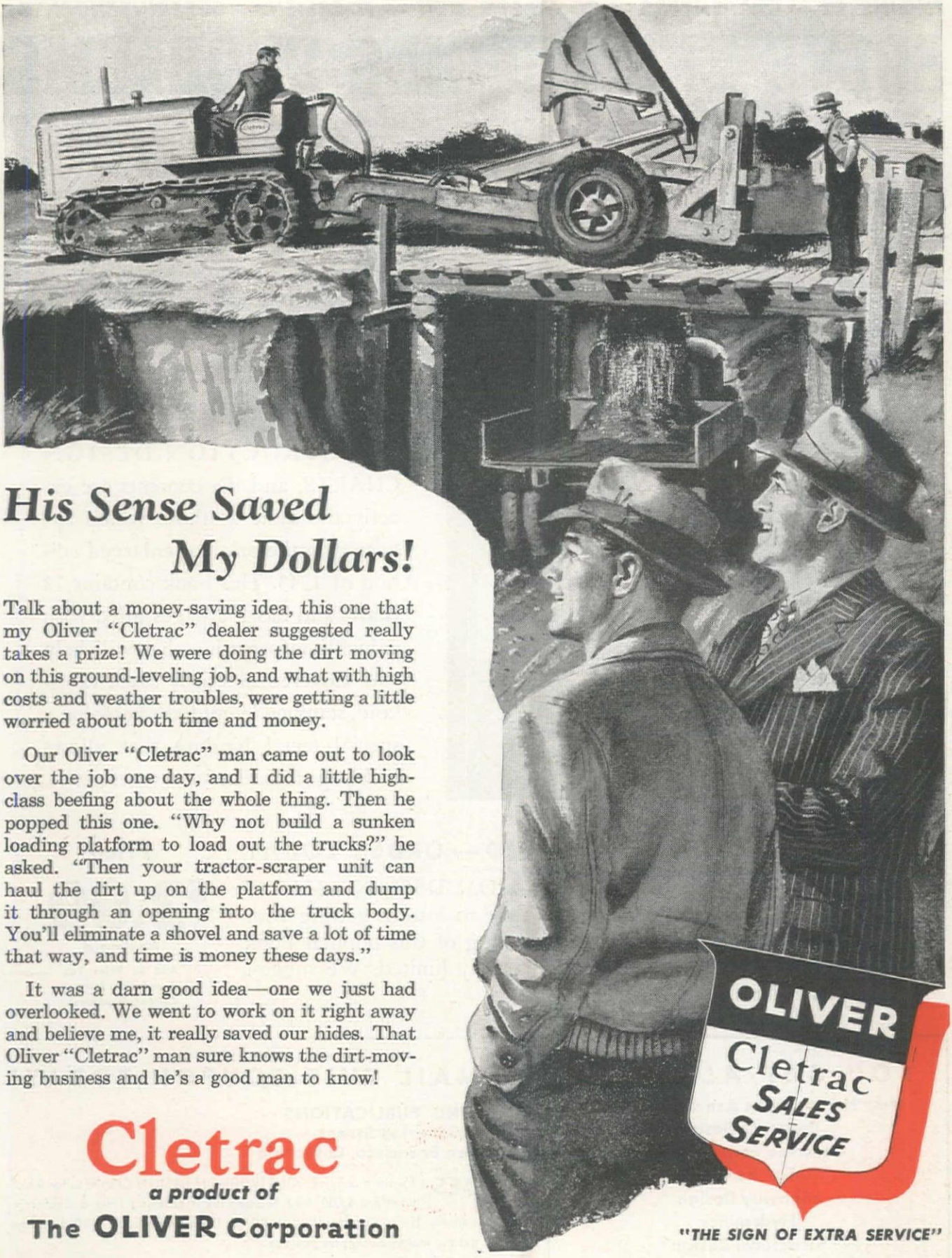
Bendix Aviation Corporation
NORTH HOLLYWOOD, CALIF.



His Sense Saved My Dollars!

Talk about a money-saving idea, this one that my Oliver "Cletrac" dealer suggested really takes a prize! We were doing the dirt moving on this ground-leveling job, and what with high costs and weather troubles, were getting a little worried about both time and money.

Our Oliver "Cletrac" man came out to look over the job one day, and I did a little high-class beefing about the whole thing. Then he popped this one. "Why not build a sunken loading platform to load out the trucks?" he asked. "Then your tractor-scraper unit can haul the dirt up on the platform and dump it through an opening into the truck body. You'll eliminate a shovel and save a lot of time that way, and time is money these days."

It was a darn good idea—one we just had overlooked. We went to work on it right away and believe me, it really saved our hides. That Oliver "Cletrac" man sure knows the dirt-moving business and he's a good man to know!

Cletrac

a product of

The OLIVER Corporation

OLIVER Cletrac SALES SERVICE

"THE SIGN OF EXTRA SERVICE"

State of Arizona: Choguill Tractor Co., Phoenix. *State of California:* Gustafson Tractor Co., Eureka; Mechanical Farm Equipment Dist., Inc., San Jose; Comber & Mindach, Modesto; Tractor Service Company, Inc., 820 Broadway, Chico; Tractor & Equipment Co., San Leandro; Flood Equipment Co., Sacramento; W. J. Yandle, Santa Rosa; Hamsher Tractor Co., Stockton. *State of Washington:* Inland Truck & Diesel Company, Spokane; Pacific Hoist & Derrick Co., Seattle; Melcher-Ray Machinery Co., 202 East Alder Street, Walla Walla; Coleman-Jones Equipment Co., Chehalis; Central Tractor and Equipment Co., Wenatchee. *State of Oregon:* Loggers & Contractors Machinery Co., Portland and Eugene. *State of Idaho:* Idaho Cletrac Sales Co., Lewiston; The Sawtooth Company, Boise. *Western Montana:* Western Construction Equipment Company, Billings and Missoula. *State of Nevada:* B & M Tractor & Equipment Corp., 1420 S. Virginia St., Reno. *British Columbia:* Pacific Tractor & Equipment, Ltd., 505 Railway Street, Vancouver.

EXECUTIVES:

How Good a Salesman are YOU?

TEST YOURSELF WITH THIS PRODUCT—

Guaranteed to Please Every Customer

CHECK HERE how many of your employees are buying U.S. Savings Bonds regularly

HERE'S HOW YOU RATE according to national averages

- ☐ **90%** or more ➡ No one needs to tell you anything about selling.
- ☐ **80%** or more ➡ Excellent.
- ☐ **70%** or more ➡ Not bad. Just apply a little more effort.
- ☐ **60%** or less ➡ This wasn't a high mark in school, either.

The "PRODUCT"—U. S. Savings Bonds—is easy to sell, because it offers every prospect a guaranteed means of making money. Each unit can produce $4 for every $3 of purchase price.

The MARKET consists of all your employees. It is an eager market, as shown by surveys—which indicate that 85% of all participants in the Payroll Savings Plan want the plan continued.

The REWARD is twofold: By helping your employees build personal security, you help assure that they will be happier, more stable—more productive on the job. And you help *all* of us, including yourself, because every Bond you sell helps to check inflationary tendencies.

Are You Using These Booklets?

If not, or if you wish additional copies, just ask your State Director of the Treasury Department Savings Bonds Division.

THE PEACETIME PAYROLL SAVINGS PLAN—A booklet, published for key executives by the Treasury Department, containing helpful suggestions on the conduct of your payroll savings plan for U.S. Savings Bonds.

THIS TIME IT'S FOR *YOU*—A booklet for employees . . . explaining graphically how the payroll savings plan works . . . goals to save for, and how to reach them with Savings Bonds.

The Treasury Department acknowledges with appreciation the publication of this message by

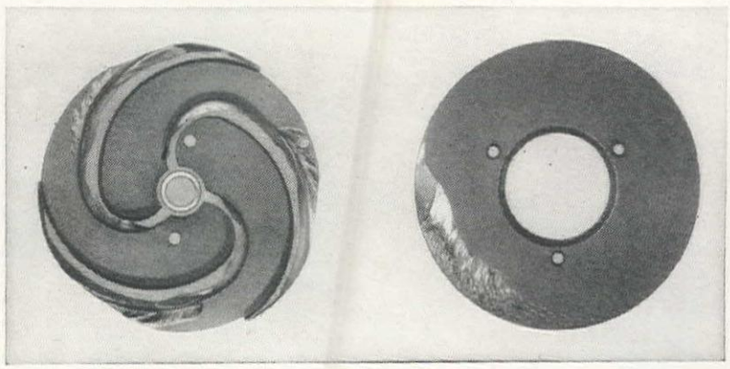
WESTERN CONSTRUCTION NEWS

503 Market Street, San Francisco 5, California

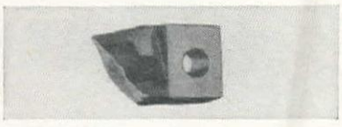
This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council

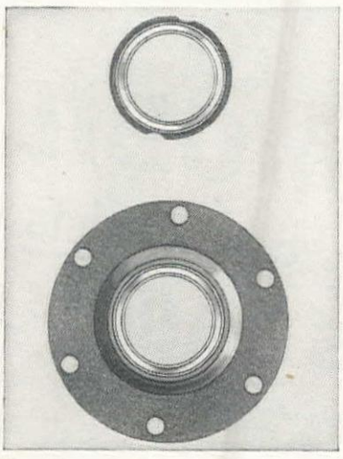
NOVO NEWS

FEBRUARY, 1947



Some idea of the quantity of grit handled by the "Pronto-Prime" during its 2000-hour torture test can be obtained from the photographs of the impeller and wear plate shown above and the replaceable cut-off shown below. The pictures clearly show that these cast-iron pieces were actually damaged by the foreign material in the water.





The Novo "stout-hearted" seal not only withstood the grit but kept on pulling 16 inches of vacuum for 2000 hours. And, as indicated by the photographs above, it was still in good condition ready for more work!

Novo "Stout-Hearted" Seal Lives Up To Its Name—Withstands 2000-Hour Torture Test

Novo engineers weren't content with subjecting the new "Pronto-Prime" pump to ordinary endurance trials. With an apparent desire to put it through an extreme torture test, they filled water with grit, fly ash, lake sand, gravel—even sandblast sand. Setting the pump on a 60-second cycle (20 pumping and 40 recirculating) with a ten-foot suction lift and 25-foot discharge head, they ran it continuously hour after hour—150 hours . . . 350 (when other pumps failed) . . . 500 . . . 1000 . . . 2000 hours! Then they stopped the pump and disassembled it. So terrific was the amount of grit handled by the pump that the cast-iron impeller and replaceable cut-off were actually worn and chewed as shown by the accompanying photographs. **But the seal—the heart of any self-priming centrifugal pump—was still pulling 16 inches of vacuum perfectly!**

Obviously, this is a much tougher test than any pump is likely to face in the field, but it proves beyond the shadow of a doubt how well the Novo stout-hearted seal can "take it."

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ARKANSAS
North Little Rock—STANDARD EQUIP. and SUPPLY CO.
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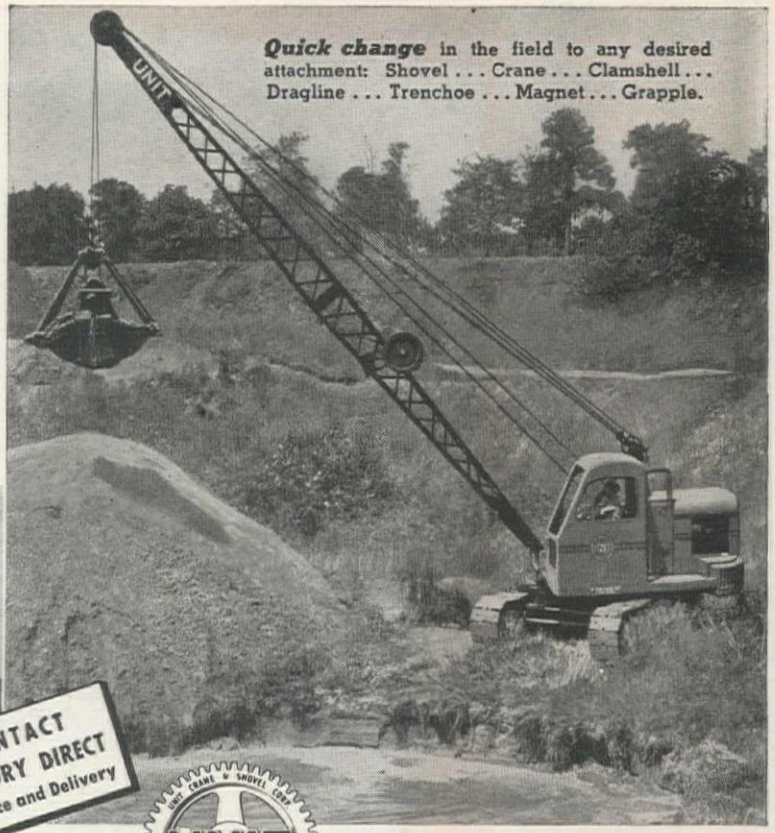
Faster Digging with UNIT 1020

UNIT takes a deep bite . . . swings fast and easy . . . moves dirt in a hurry. That's why it is the preferred excavator . . . used extensively all over the nation. Engineered for the really tough jobs with drop forged alloy steel gears and shafts completely enclosed and oil-sealed in UNIT's exclusive One-Piece Gear Case. Straight line engine mounting . . . Automatic traction brakes . . . Disc type clutches. UNIT's modern Full Vision cab promotes SAFETY, speeds up job. Investigate today!



Quick change in the field to any desired attachment: Shovel . . . Crane . . . Clamshell . . . Dragline . . . Trenchoe . . . Magnet . . . Grapple.

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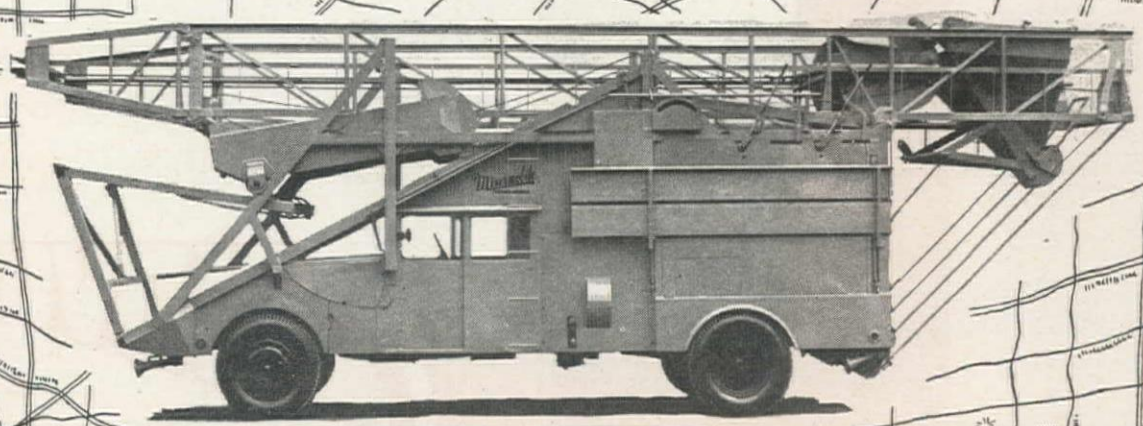
Mixes and Hoists Concrete

MOVES EASILY from job to job



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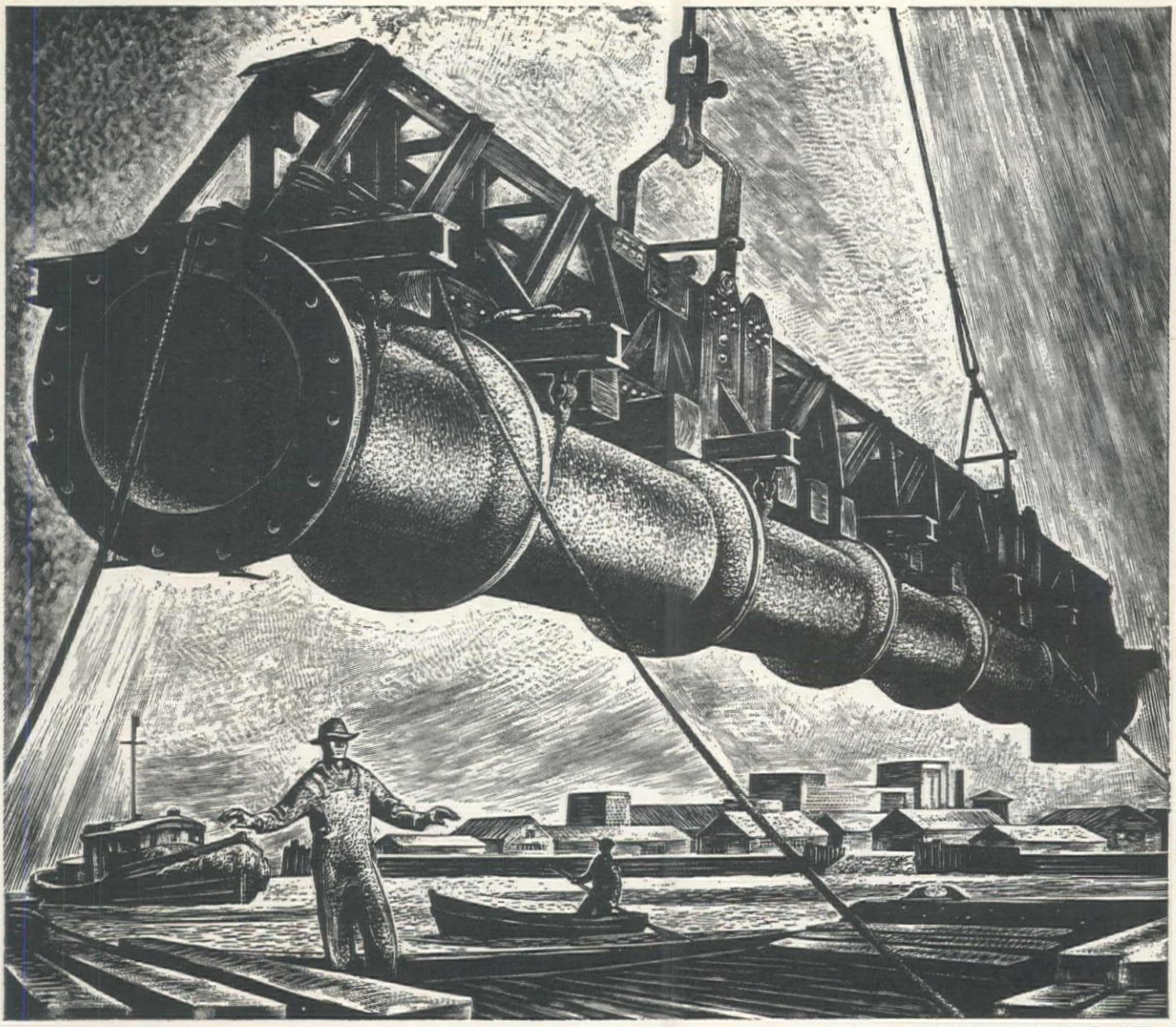

Original Woodcut by Lynd Ward

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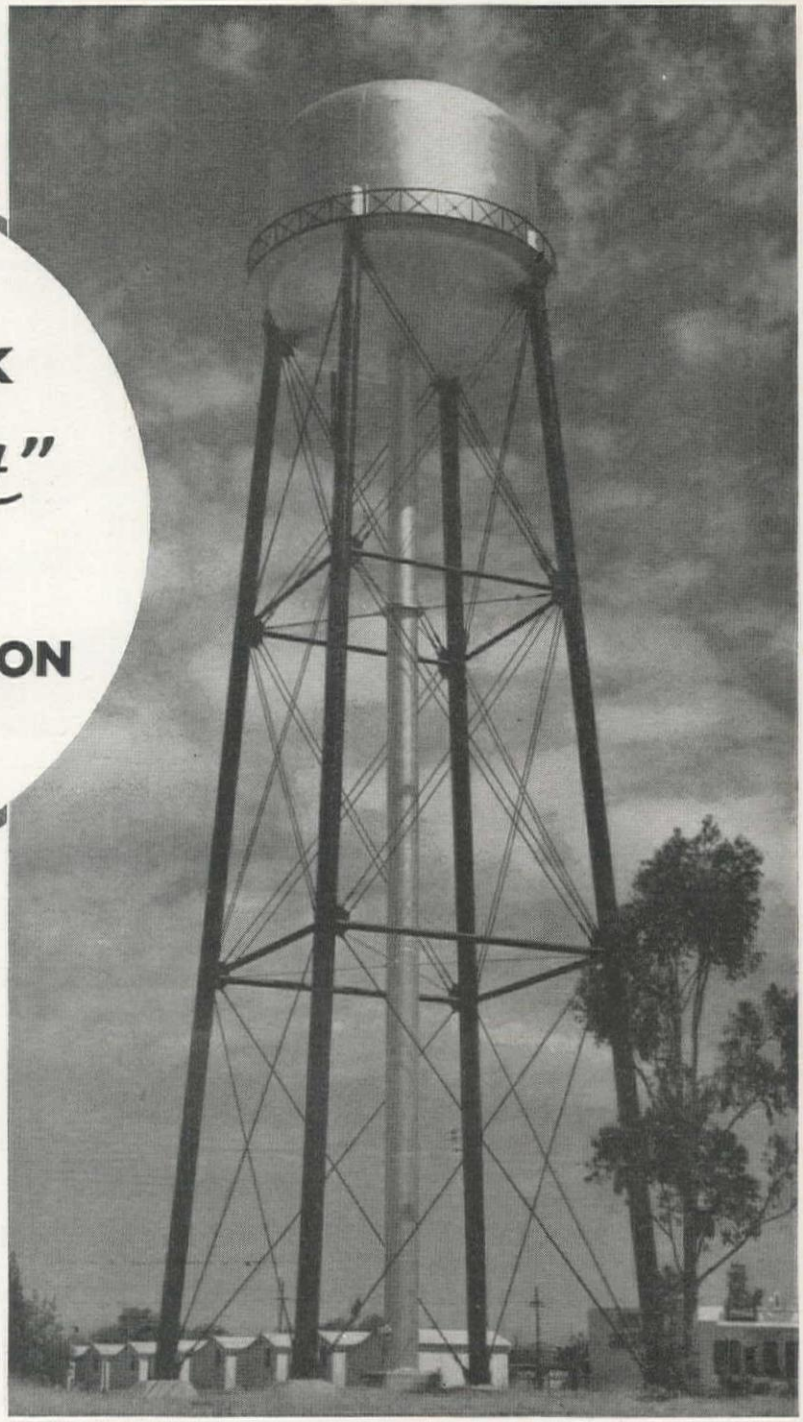

YEARS AGO Soledad, California, depended upon one of its public-spirited residents for its water supply. The water distribution system was built by this local citizen who extended pipe lines from a well on his property to the homes in the community. The time came, however when these lines became inadequate in size to furnish sufficient water for daily domestic use and were of practically no value for fire protection. Storage facilities then consisted of a 20,000-gal. tank on a 30-ft. tower.

In rebuilding and modernizing the Soledad water distribution system the original "lines" were replaced with cast iron pipe, a 100,000-gal. reservoir was constructed and a service pump installed to supply the tank from the ground reservoir. An 1100 gpm-capacity gasoline-driven fire pump was installed to boost the pressure in the mains to 55 lbs. per sq. in. for fire protection. The final step in "rounding-out" the modernization program in the water distribution system at Soledad was the erection of the 100,000-gal. Horton elevated steel tank shown above to replace the old tank.

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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
February, 1947 Vol. 22, No. 2

Ostrich, Washington Style

AS FAR AS the State of Washington is concerned there is no such thing as the Columbia River Basin Inter-Agency Committee. In the reputed manner of the ostrich the State has its head buried in the sand so that it may not see the existence of the Committee, although to be accurate it should be said that the State's head is being held in the sand by Gov. Mon Wallgren.

Despite the fact that the Committee chose to hold its recent meeting in Seattle, despite pleas by various civic organizations that the State be represented at meetings of the Committee, despite the fact that Washington has more at stake in the Columbia River than any of the other five states which have land within the basin, and despite the personal invitation of the Committee's chairman, Col. Theron Weaver, Gov. Wallgren has consistently refused to permit the State to enter in any way into the activities of the Committee.

At first the Governor stated that Washington would not be dictated to on Columbia River matters by other states which have relatively smaller interests in the basin. In this argument the Governor overlooks, among other things, the fact of water rights. When pinned down again the Governor said the Committee had no authority, contradicting his first argument and ignoring the purposes of the Committee. Finally, the Governor admitted that he would be satisfied with nothing less than a Columbia Valley Authority, patterned after the Tennessee Valley Authority.

Although he may not have stated it in so many words, it is quite apparent that Gov. Wallgren fully intends that the Committee shall fail in its effort to unify the development of the basin without resort to establishment of an Authority, if it is within his power to make it fail by withholding cooperation completely. We can't help wondering how the Governor is able to justify his position of wanting the State to have the power of decision in development of the basin and, in the same breath, holding out for a valley authority which would immediately REMOVE ALL POWER FROM THE STATE.

All in all, the situation reminds us of a very naughty child refusing to behave because it has not been given something it thinks it wants very badly. That's probably closer to the point than the ostrich idea anyhow.

Krug Still At It

JULIUS A. (CAP) KRUG, Secretary of the Interior, is at least a persistent fellow!

Although the Nation on Nov. 5 of last year vehemently indicated that it does not favor socialism or paternalistic control, he nevertheless persistently and consistently plugs along toward that goal. Even in the State of Washington, generally rather New Dealish in its voting tendencies, after he had gone far out of his way to vigorously support a Columbia Valley Authority, his program and his candidate for the Senate were crushed. But either Cap doesn't admit defeat or he didn't read the election returns, for a few days ago he called a meeting of power users and agencies interested in power generation at Hoover Dam to propose that contracts negotiated when the dam was built, which provide that generation of electricity be under the direction of the Los Angeles Department of Water and Power and the Southern California Edison Co., be voided and this function be taken over by the Bureau of Reclamation, thus setting up a framework which could be expanded into another Tennessee Valley Authority or Bonneville Power Administration.

The fact that under the present system of operation, the power plant is a model of efficiency and production, that construction costs are being honestly repaid, and that everyone seems completely satisfied with the arrangement, doesn't seem to matter. Everyone is satisfied, that is, but Cap and his associates, who consider this foreign ideology of federal control of all the functions of life, the most important objective of their service in government.

We don't know whether or not he has the power to cancel the contracts which govern this satisfactorily-working arrangement. We just wish it were possible to put the issue on the Colorado squarely up to the voters, as was the case on the Columbia. But probably he still wouldn't be able to understand the desire of the American people to be their own bosses.

Routine—50% Loss

ANOTHER ENTRY in the record of government failures in the housing field was chalked up last week when the books of the United States Housing Corporation were closed. The record of the USHC: the government's original investment, $66,500,000; the government's loss, $33,911,000. Even more striking than the loss incurred by the government were the complications which kept the USHC in existence a quarter of a century after any need for it had evaporated. More than a generation has been spent in untying the legal tangles. The Corporation could not market the remaining houses; in most cases it was out of possession. The accrued tax claims—which the government denied—were in excess of the value of the houses. Thus the federal government has demonstrated once more that it cannot build, own or operate housing efficiently or satisfactorily.

—National Association of Home Builders.

Engineers' Wages Must Go Up

THE STATE Road Commission of Utah, through its chairman Ray H. Leavitt, and its chief engineer, Roy McLeese, is battling in the State Legislature to get permission to raise salaries of its engineering personnel to a level with those offered in private industry, so that it will be able to employ capable men. We don't know if the tactics being employed by Messrs. Leavitt and McLeese are the wisest which might have been used to secure their ends, but we certainly sympathize with their objectives.

Salaries in the Utah and other highway departments are lamentably low, and it is no wonder qualified young engineers are not attracted to them. The majority of the men now working in many of these departments are old-timers, loyally carrying on at wages below what they might command elsewhere, in the interests of improving the highways. Through years of service they have become intimately acquainted with each mile of highway and would feel they were being disloyal to a friend were they to desert the roads for the attraction of more money.

But young men seeking a start in life have built up no such feeling, and turn to fields offering greater return, and who can blame them?

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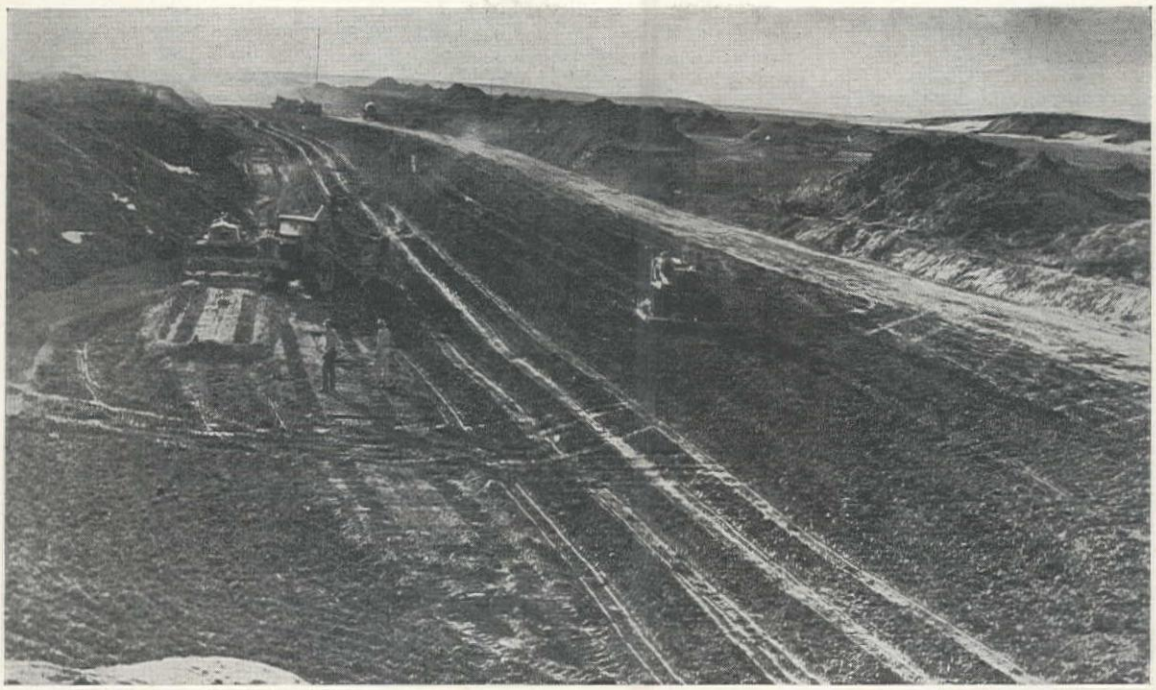


BACKFILL of the cutoff trench for Cherry Creek Dam by Gordon-Bressi-Bevanda Constructors, Inc., contractors. Selected material is spread by carrier scraper and rolled with sheepsfoot roller to secure required compaction. Maximum depth is 50 ft.

Cutoff for Cherry Creek Dam

First contract on flood control structure to harness Cherry Creek above Denver includes excavation of pervious material and replacement with impervious rolled earth to form cutoff wall for dam foundation — Dewatering of excavation is most serious problem encountered.

EARLY SETTLERS who founded the City of Denver, Colorado, at the confluence of Cherry Creek and the South Platte River were warned by Indians not to build close to the banks of the sandy-bottomed trickling creek. That was good advice, for since 1864, Denver has suffered 9 major floods from the basin of Cherry Creek and is now considered as the second most vulnerable city in this country to flood damage. No storm of record has fallen over all of the 414 sq. mi. of the Cherry Creek valley above Denver, but the possibility of such an occurrence has been established by the Weather Bureau and the resulting flood would be a major disaster for the city.

In 1890 the Denver Water Storage Co. built Castlewood Dam, an irrigation structure of little flood control value, 33 mi. upstream from the site of the new Cherry Creek Dam. On Aug. 3, 1933, a cloudburst overtopped the Castlewood Dam resulting in Denver's worst flood —with an estimated peak flow of 34,000 sec. ft. compared to a normal discharge of 26 sec. ft. To provide flood protection, an earth-fill flood retention structure known as the Kenwood Dam was built in 1935-36, approximately 11 mi. above the juncture of Cherry Creek and the South Platte River. Planning for the new Cherry Creek Dam and Reservoir was undertaken when later studies showed that the Kiowa Creek center of the 1935 storm over eastern Colorado, a portion of which fell over Cherry Creek, might easily have centered over the Cherry Creek basin. The resulting flood would overtax the capacity of Kenwood Dam and inundate downtown Denver.

Project authorized

In Aug., 1937, Congress largely as the result of the efforts of the late Congressman Lawrence Lewis who characterized Cherry Creek as "sleeping tiger of the plains," authorized a survey by the Corps of Engineers to determine the need for additional flood protection on Cherry Creek. The subsequent survey report recommended additional flood control measures on Cherry Creek; construction was authorized in Aug., 1941, and the 79th Congress appropriated the necessary funds. The primary purpose of the project is the complete protection of the city of Denver against floods on Cherry Creek. In its initial phase, the project will be operated for flood control only with no permanent storage; however, when plans now in progress are realized, waters of the Blue River on the Western Slope will be diverted and stored in the Cherry Creek reservoir below the spillway crest (elev. 5598) for release during the irrigation season. Storage capacity below the spillway crest includes 10,000 ac. ft. for silting and fish and wildlife purposes, and 85,000 ac. ft. for irrigation and other water uses. Surcharge capacity of 90,000 ac. ft. to elev. 5625 provides for storage of the project design flood with a maximum discharge through the spillway structure of 12,000 sec. ft.

Accordingly, in July of 1946, a contract was entered into between the Corps of Engineers and Gordon-Bressi & Bevanda Constructors of Los Angeles, Calif., for the construction of a rolled earth cutoff about 2,000 ft. upstream from the Kenwood Dam, and the diversion and care of water during construction. This first phase of construction on the multiple-purpose reservoir

was started in July, 1946, with appropriate ground breaking ceremonies at the dam site.

Principal speaker for the occasion was Brig. Gen. Lewis A. Pick, Missouri River Division Engineer for the U. S. Army Engineers, builder of the famed Ledo or Stilwell Road and co-author of the Pick-Sloan Plan which Congress approved for the control and development of streams in the Missouri River Valley. The construction of the Cherry Creek Dam and Reservoir is under the supervision of the Denver District, commanded by Col. Craig Smyser. Col. Smyser served during the war in Alaska and the China-Burma-India Theatre of Operations under Lt. Gen. Raymond A. Wheeler, now Chief of Engineers. Paul F. Jensen is field Resident Engineer on the project responsible for surveys and inspection required during the construction period, while the contractor's superintendent is Roscoe Downs of Los Angeles.

General specifications call for a rolled earth fill dam rising to a maximum height of 140 ft. above the stream bed (crest elev. 5645) with an overall length of 14,300 ft., an average base width of 1200 ft., in the valley section and a top width of 30 ft. The uncontrolled spillway will be an unlined channel discharging through the right abutment into the adjacent drainage basin of Tollgate Creek and thence into the South Platte River below the city of Denver. The concrete outlet works will be located at the base of the right abutment.

Present operations

The cutoff, now under construction, was designed to extend the impervious rolled earth core of the dam into the Denver formation, typical bedrock for the region which consists of alternating horizontal thinly bedded clay, silt and sandstone; neither hard or granularly cemented, as in rock, but compact and relatively impervious. The formation rises in the abutments and, with the inclusion of a positive cutoff under the dam, will form a tight reservoir. An open cut trench with 20-ft. bottom and 1½:1 side slopes is being excavated to a maximum depth of about 50 ft. to elev. 5456.

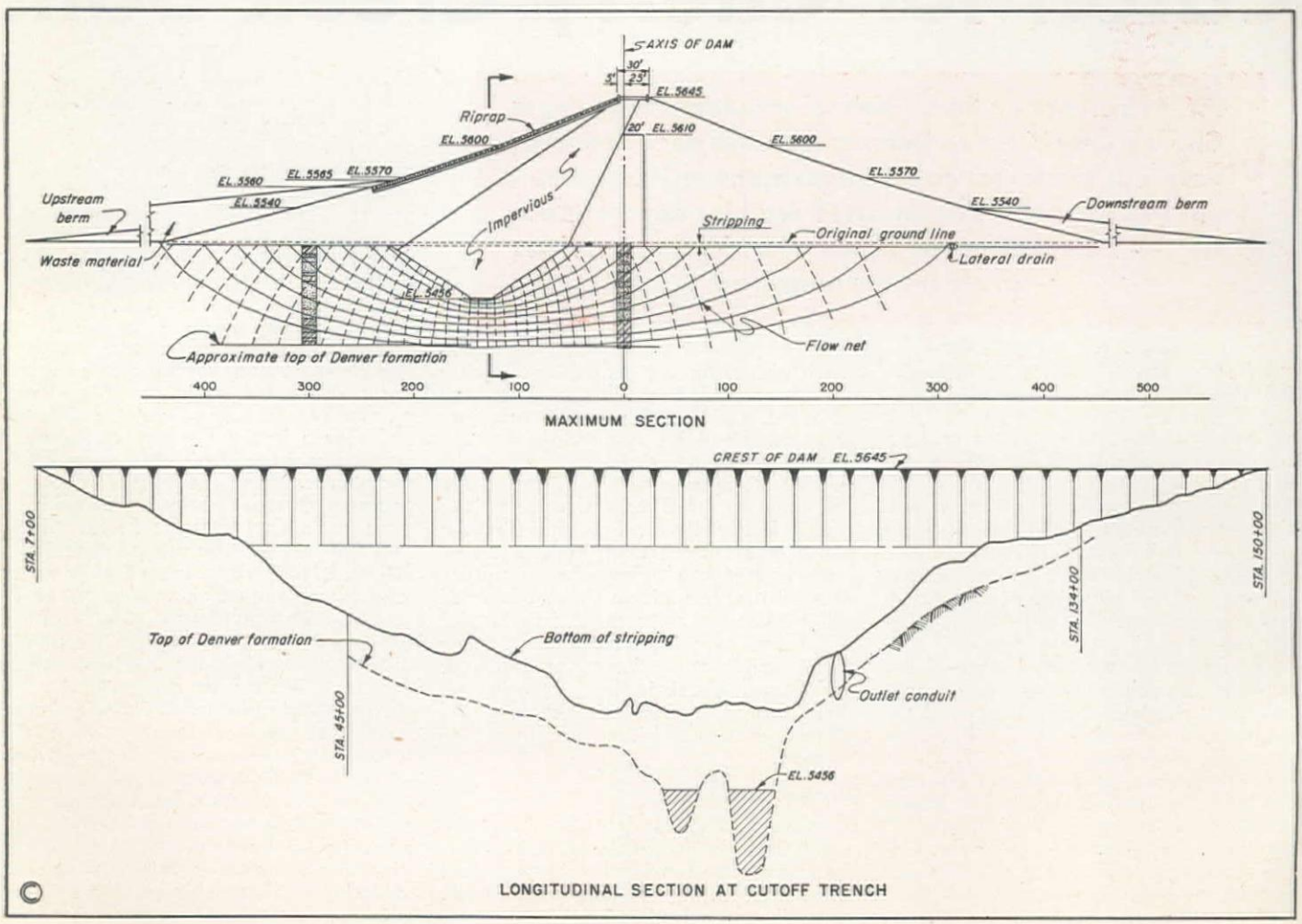
An 8-ft. core wall of compacted impervious backfill material was designed to extend the cutoff through the deeper portions of the overburden. This the contractor planned to accomplish by driving a double row of steel sheet piling, excavating between the rows, and then backfilling with selected materials. A 5-cu. yd. Page walking dragline is in use on the project and is maintaining rapid progress in the excavation of the cutoff trench. This huge diesel powered dragline, first used for coal stripping operations in Pennsylvania, has a 125-ft. boom and excavates approximately 2,500 cu. yd. in an 8-hour shift. Since the 3rd of October, this 325-hp. dragline, working 24 hours a day, has excavated over 200,000 cu. yd. of material.

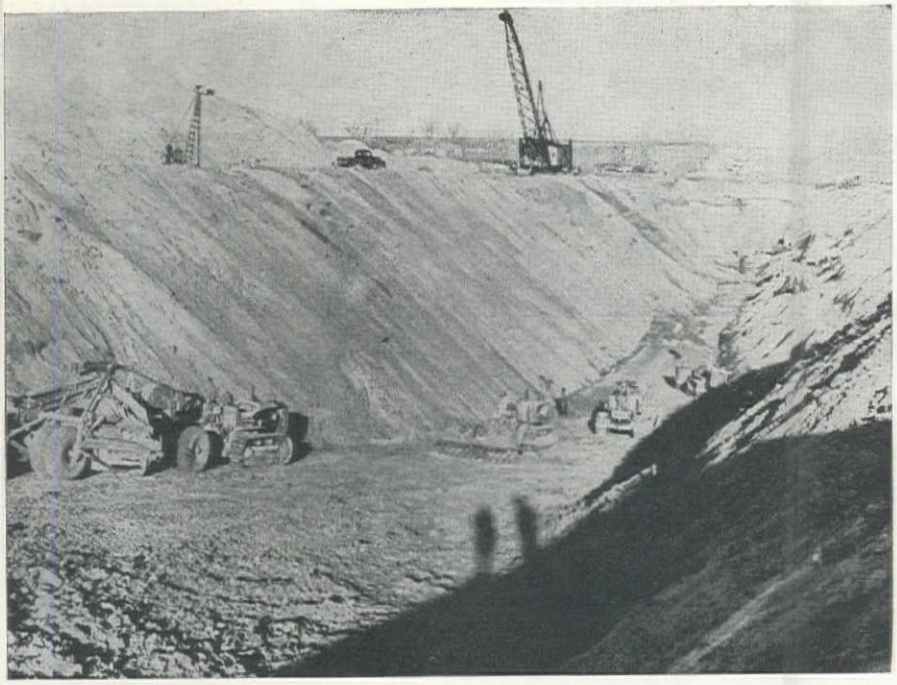
CROSS-SECTIONS of the final dam and the stream bed. The cutoff, under construction at present, has a maximum depth of 50 ft., except for an 8-ft. core wall extended to bottom of overburden (shaded area).

Present operations above elev. 5456 consist of the excavation of unsuitable materials from the trench and the placement of 915,000 cu. yd. of impervious backfill. The excavation in the deeper portion of the trench is being done by shovels and draglines of varying capacity up to that of the 5-cu. yd. dragline. Excavated materials, now being stockpiled for future use in the dam itself, have been recast as many as three times to clear the future dam foundation area. A fleet of Tournapulls is presently engaged in backfilling the shallower portions of the trench from the borrow and stockpile areas making round trips of from 3,000 to 7,000 ft. The selected material is spread in 6-in. layers, after which it is scarified, sprinkled and compacted by sheepsfoot rollers under control of the field laboratory.

Materials testing

Laboratory controls involve determinations of permeability, moisture content, mechanical analyses, compaction curves, densities and plastic and liquid limits. The overburden materials and the Denver formation materials show no uniformity of composition but, in general, the materials in the left or west abutment areas contain the larger percentage of clay. A representative soil sample taken from a borrow area near the left abutment was analyzed as follows: 2% gravel, 37% silt, 23% fine sand, 11% coarse sand, and 27% clay. Plastic in-





BEGINNING BACKFILL in one of the deepest excavations for Cherry Creek Dam foundation. On the bank in the background is the 5-cu. yd. walking dragline which has materially speeded earth removal. It was brought from Pennsylvania coalfields.

dices range from 12 to 25, liquid limits from 30 to 35, and modified compaction ranges from 93% to 99% and averages 94%. A minimum of 10 passes of the sheepsfoot roller are made on each layer to attain the required density. Densities range from 107 to 123 lb. dry weight per cu. ft., or, in terms of specific gravity, from 2.62 to 2.70.

Materials from stripping operations, waste materials and other excavation materials, are used in construction of upstream and downstream cofferdams. The downstream cofferdam will provide protection from water which may be impounded by the existing Kenwood Dam. Minimum crest elevation of the cofferdam is 5520, and the top width is 20 ft. with 3:1 side slopes. Any excess waste or stripping material may be placed on the upstream side of the upstream cofferdam or on the downstream side of the downstream cofferdam on a 10:1 slope. The two cofferdams will remain in place and ultimately become an integral part of the embankment.

Field permeability tests made during the project planning stage indicated that considerable seepage loss with full conservation pool could be expected through the pervious overburden materials of the dam foundation. However, actual conditions during the early stages of construction showed that the early estimates of seepage loss were too high.

Unwatering foundation

The contractor elected to unwater the work area by means of a series of deep wells varying in depth to 105 ft. and penetrating five feet into the Denver formation along the upstream edge of the cutoff trench in the deeper sections. The 32-in. wells were drilled (without casing) very economically by the Canfield Drilling Co. of Fort Morgan, Colo., by maintaining a hydraulic head of 5 ft. above the ground water level. Because of the sandy nature of the overburden materials, it was necessary to use very muddy water, which after recirculating from a slush pool, was pumped out together with the drillings through the drill shaft and led back to the slush pool where the larger particles settled out. An 18-in. steel casing, the lower 20 ft. perforated, was lowered into each well and backfilled with well graded gravel. A motor driven, deep well impeller type pump was lowered to the bottom of each well and the outflow collected in a header pipe discharging into the diversion channel.

Forty-two observation wells were drilled so that the success of the unwatering might be observed. It became apparent at an early stage that full capacity operation of the pumps (the largest rated at 2,500 g.p.m.) would not be feasible as the pumps emptied the casings almost immediately. The maximum discharge, obtained from simultaneous pumping of 13 wells, was about 10,000 g.p.m. Inspection of the plotted observation well readings showed that the water table was being lowered generally only about two feet per week and that the ground water reservoir was being fed not only from upstream but apparently from the abutments as well. The failure of the deep wells to lower the water table over the entire area resulted in extensive seepage into the left abutment cut.

The cut was therefore shelved to accommodate well points at several levels, in an effort to dry up the bottom portion of the trench but, as there was still considerable seepage into the trench, French drains were installed in the Denver formation along both edges of the trench bottom. These drained to sumps and the water was pumped out on either side. Gravel was then placed in the drain and around the sumps, thus making it possible to place the backfill in the dry.

Proposed alternate cut-off

The difficulties encountered in unwatering and the apparent infeasibility of completely drying the overburden, led to an investigation of alternate methods of constructing the cutoff below the 50-ft. level or elev. 5456. As an alternate to the original design discussed above, the driving of sheet piling to form a wall of alternating cells and double thickness steel was proposed. Steel piling sections similar to U. S. Steel Section M 116, would have been driven in the cutoff trench so as to form hexagonal shaped cells having a maximum width of 20 in. and a length of about 28 in., alternating with steel walls having a thickness of

FIRST EFFORTS to dry up the excessively wet excavation was by wells along upstream edge of the cutoff, but these were only partially successful. Wellpoints, shown here, were installed later to assist in drying out the bottom of the trench.

INSPECTING the cutoff site are, left to right: R. W. STUCK, civilian engineer with the Corps of Engineers; COL. JAMES G. TRUITT, special assistant to Brig. Gen. Lewis A. Pick; COL. CRAIG SMYSER, Denver District Engineer; T. A. MIDDLEBROOKS, Chief of Soils, Geology and Geophysics; and F. B. SLICHTER of the Missouri River Division Engineer Office.

¾ in. and width of 4½ in., formed by riveting and end welding the webs of two piles back-to-back. This wall was to be driven 5 ft. into the Denver formation, the cells cleaned of all stream bed materials and backfilled with concrete.

A conference in November in which R. W. Stuck, T. A. Middlebrooks, Chief of Soils, Geology and Geophysics Branch of the Office of the Chief of Engineers, Col. James G. Truitt, Special Assistant to Brig. Gen. Lewis A. Pick, and F. B. Slichter of the Missouri River Division Engineer office conferred with Col. Smyser and members of the Denver District engineering staff regarding the problem of constructing the impervious cutoff wall below the 50-ft. level, brought out that all of the data gathered in the unwatering operations indicated a much lower rate of subsurface blow than previously anticipated. Accordingly, this data was used in a new determination of the seepage loss to be expected with the omission of the cutoff below elev. 5456.

As shown in the accompanying sketch, two pervious membranes of 7,000 sq. ft. and 20,000 sq. ft, respectively, are to be considered. The subterranean flow was computed with a full conservation pool using a graphical method for two-dimensional flow. The use of theoretical formulae to determine the permeability coefficient for each of the membranes gave results which compared favorably with those obtained with the use of an empirical method of interpreting the results from the contractor's day to day pumping operations and the plotted observations from the 42 wells, and resulted in a computed maximum seepage loss of six second feet. This computed rate of seepage is well within the allowable loss of irrigation water to be stored. For this and the further reason that complete cutoff of seepage might reduce the supply to downstream users of underground water, the deletion of the cutoff below elev. 5456 from the contract has been recommended.

The record 33-in. snow fall in November stopped backfill operations for 7 days. Mild temperatures since that time have made it possible to resume backfill on a 3-shift basis which will continue so long as weather permits, although the contract allows for a 3-month shutdown period during December, January and February. Work on the first phase of Cherry Creek Dam construction is approximately 40 per cent complete with final completion scheduled for June, 1947.

Expenditures Mount for L. A. Flood Control

THE STAGGERING SUM of $172,814,348 has been spent thus far in an effort to control floodwaters in Los Angeles County. County records are now being examined by William A. Smith, chairman of the Board of Supervisors and its flood control committee. Smith stated that in spite of this vast expenditure much remains to be done before the program can be considered complete. Future flood control works, authorized or planned, are expected to cost $243,074,800.

The Los Angeles County Flood Control District has contributed $75,355,533 of the total thus far expended. This amount was financed through flood control district taxes or through sale of bonds. A sum of $5,158,546 has been expended by the State of California on the county's flood-control program; and Federal expenditures have totaled $92,300,304.

The Federal government has approved further projects estimated to cost $94,660,450, for which funds have not been authorized. However, the government has authorized a $86,007,700 expenditure, which has not yet been made. In addition to that amount Los Angeles County proposes to spend $62,406,650, making the total cost of future planned expenditures $243,074,800.

Civilian War Prisoners Sue Former Employers

SUIT FOR more than $600,000 in back pay and damages was instigated recently by eight civilian workmen who claimed they spent over three and one-half years in Japanese prison camps after capture on Pacific islands. Simultaneously, the widow of a ninth man sued his former employers for $50,000 damages and $8,910 in back pay in a Federal Court suit. Her husband died in prison.

Hawaiian Dredging Company, Ltd., of Honolulu; Raymond Concrete Pile Co., New York City; Turner Construction Company of New York City; Morrison-Knudsen Company, Inc., Boise, Idaho, and J. H. Pomeroy & Co., Inc., San Francisco, were all named in the suit.

The men charged their former employers with failing to provide a safe place to work, although aware of the imminence of war. They were employed on Wake, Guam and at Manila in the Philippines.

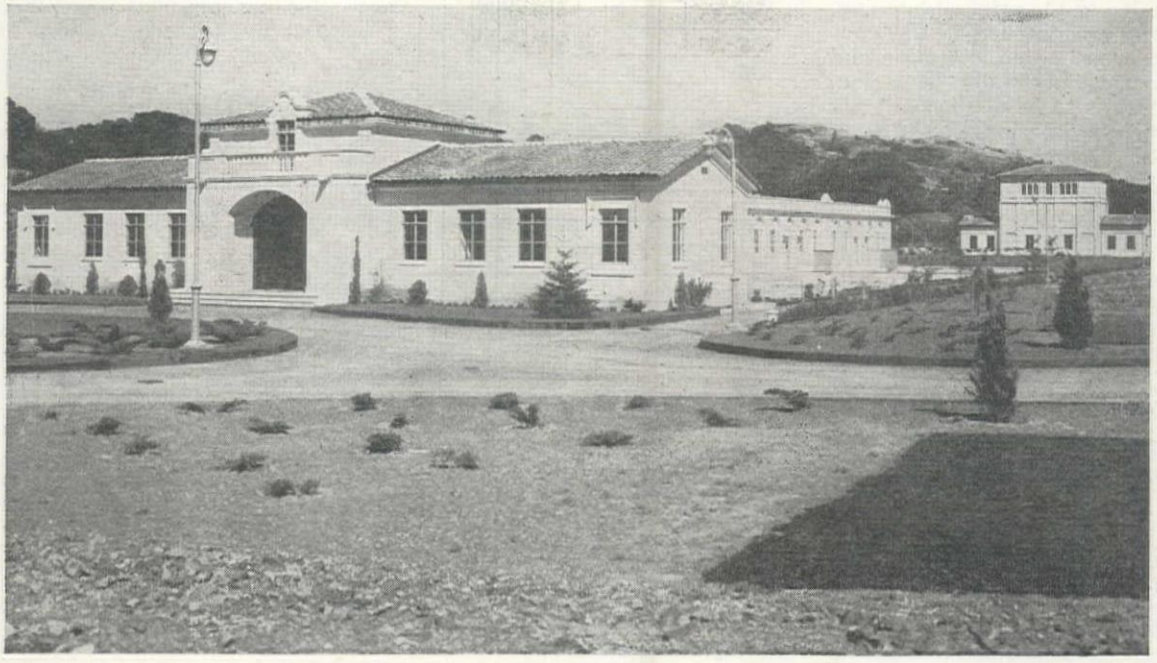
Sewage Disposal Plant Considered at Cheyenne

THE CONSTRUCTION of a sewage disposal plant costing over $800,000, was under consideration by the Cheyenne, Wyoming, city council recently. The report of Black and Veatch, Kansas City consulting engineers, suggested four possible sites on Crow creek, at varying distances from the city.

According to Mayor John J. McInerney, Cheyenne sewage receives no treatment of any sort at present. The sewers empty into three outlets on Crow creek. The mayor stated that with the growth of Cheyenne, sewage disposal had become an increasingly serious problem. Funds for the proposed project would be raised through a bond issue.

Another problem under consideration is flood conditions in the east and northern portions of Cheyenne. City Engineer H. G. Watson is preparing a complete report concerning a storm sewer project to alleviate the water runoff in that part of the city.

Safe Water in East Bay Area



Orinda and San Pablo Filter Plants are being enlarged to their ultimate capacity — Because of foresighted planning on the part of the designers, the extensions can be completed with only a few short shutdowns

By G. L. HARRISON
Senior Civil Engineer,
East Bay Municipal Utility District,
Oakland, Calif.

TO MEET the increased water consumption in the cities along the eastern rim of San Francisco Bay, two of the East Bay Municipal Utility District's largest filter plants are being enlarged. The District serves water to a population of approximately 835,000, located in the cities of Oakland, Berkeley, Richmond, Alameda, Piedmont, San Leandro, El Cerrito, Albany, Emeryville, and adjacent unincorporated territory in Alameda and Contra Costa Counties.

There are two sources of supply—local watershed runoff and snow water from the high Sierras that is impounded in the Pardee Reservoir on the Mokelumne River some 90 mi. east of Oakland. The Mokelumne water is brought to the East Bay area through a system of steel pipes and concrete-lined tunnels that is known as the Mokelumne Aqueduct. The local watershed runoff is impounded in the San Pablo, Upper San Leandro and Chabot reservoirs, and each serves as a source of supply for its respective filter plant. Two filter plants—Orinda and Grant Miller, take water directly from the aqueduct, and the excess flows by gravity into San Pablo Reservoir where it becomes available to the San Pablo Filter Plant.

It is the desire of the District to filter all water before it reaches the distribution system. Chlorination, or course, is mandatory. The existing filtration system consists of five filter plants, and their capacities are shown in Table I. The Chabot and Grant Miller plants are pressure filters, and the others are rapid-sand filters. The accompanying chart shows the trend in water consumption during the last 12 years in the area served by the District. It becomes apparent, after a comparison of the chart with Table I, that additional filter capacity is needed, and it was decided to enlarge the San Pablo and Orinda plants to their ultimate capacities of 55 and 105 mgd., respectively.

Orinda Filter Plant

The Orinda Filter Plant was designed and constructed by District forces, and placed in operation in May, 1935. It has been described in detail in an article by J. D. DeCosta in the October 1936 issue of the Journal of the American Water Works Association.

Although constructed for a flow of 42 mgd., it was planned for an ultimate capacity of 105 mgd. In the original design, a great deal of thought was given to facilitating the future enlargement. All major features such as influent channels, chlorination and chemical facilities, washwater pipe and effluent pipe were planned for the ultimate flow of 105 mgd.

With all of this preliminary planning in the background, the design for the present enlargement has been a comparatively simple matter, and essentially consists of duplicating the existing filters and piping. Twelve years' operating experience, however, has brought out a few weaknesses in the original design that are now being corrected.

GENERAL VIEW of the Orinda Filter Plant with the chemical building in the background. The Spanish architecture of the plant is well suited to its surroundings.

The major change is in the design of the main filter collectors. The collectors in the original plant follow the conventional design and consist of a special cast iron 20-in. I.D. pipe and adapter for bolting the manifold assembly. With an inlet velocity of 14.04 cu. ft. per sec., conforming to a 36-in. rate of wash, it has been found that unequal washing velocities occur across the length of the filter, the lower velocities being at the inlet end.

In order to correct this inequality, the present collectors taper from 28-in. diameter at the inlet to 18¾ in. diameter at the far end. Instead of being of cast iron, the collectors are cast in concrete. Cast integrally with the collector is a cast iron adapter, the top being flush with the filter floor. The top portion or turret of the adapter is bolted to the lower portion, forming the manifold system into which are screwed 3-in. I.D. brass pipe laterals. The laterals, placed 7½ in. on centers and provided with ⅜-in. holes drilled on the underside at 5.08-in. centers, are identical with the original installation.

Although an attempt is being made to secure a uniform rate of wash throughout the filter bed, no serious difficulty has been encountered in the existing filters due to the inequality in velocities. The gravel is prevented from being displaced laterally by means of a cellular construction in each filter. Before placing the gravel in the filters, the entire area is divided into cells by means of one-inch redwood boards. The cells are 2 ft., 6 in. x 2 ft., 6 in. in plan and

22 in. deep, and for lack of a more technical name, are called "egg crates."

Some difficulty has been experienced with condensation in the building housing the operating gallery during the winter months. In the original building, a plaster coat was applied to the concrete walls, but some discoloration and spalling occurred. In the new extension, a stucco wash is to be applied directly to the concrete interior. Because of architectural reasons, a combination of wood and steel doors were provided in the original plant, but they have been found to be unsatisfactory because of the humid atmosphere inside the building, and steel doors are specified for the extension.

For ease of repairing the hydraulically-operated valves, an eye bolt is to be imbedded in the concrete directly over each valve in the pipe gallery. This will eliminate the necessity of constructing temporary framing whenever overhauling becomes necessary.

In order to facilitate hydraulic studies through the plant, and to easily detect excessive head losses through the rate controllers, suitable hose taps have been provided at each filter unit for manometer attachments. One tap is provided in the filter effluent line downstream from each rate controller and another to the raw water channel in the wall immediately above. The loss between these two taps represents the total loss through the complete filter unit. The loss of head through the filter sand and underdrains is measured by the usual diaphragm unit, and the amount appears on the loss-of-head dial on the operating table.

In the original plant, all washwater facilities were designed to accommodate a wash rate of 42 in. rise per minute, although a rate of 36 in. is being used. The total length of the washwater pipe in the pipe gallery is approximately 480 ft., so in order to insure the design rate of wash to the last filters, the washwater line is being fed at both ends of the pipe gallery. This requires a 24-in. line to be laid parallel to and outside the building.

Because of foresighted planning by the original designers, it will be possible to complete the extension and put the entire plant into operation with only two short shutdowns of the plants.

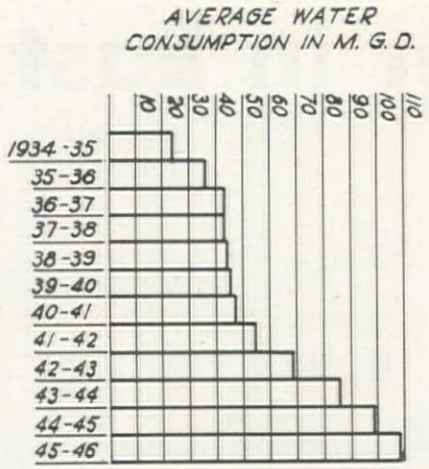


CHART SHOWING trend of water consumption in m.g.d. during the past 12 years in the East Bay Municipal Utility District area.

The Spanish architecture of the plant is well suited to the rolling wooded hills that surround it, and the grounds are attractively landscaped.

One attractive feature is the treatment of the outlet structure where the filtered water rises around a circular weir and drops down into the inlet of the Claremont Tunnel. The flow over the 10-ft. diameter weir, which is 16 ft. below the ground level, is quite impressive and can be seen through a glass enclosure over the top of the structure.

San Pablo Filter Plant

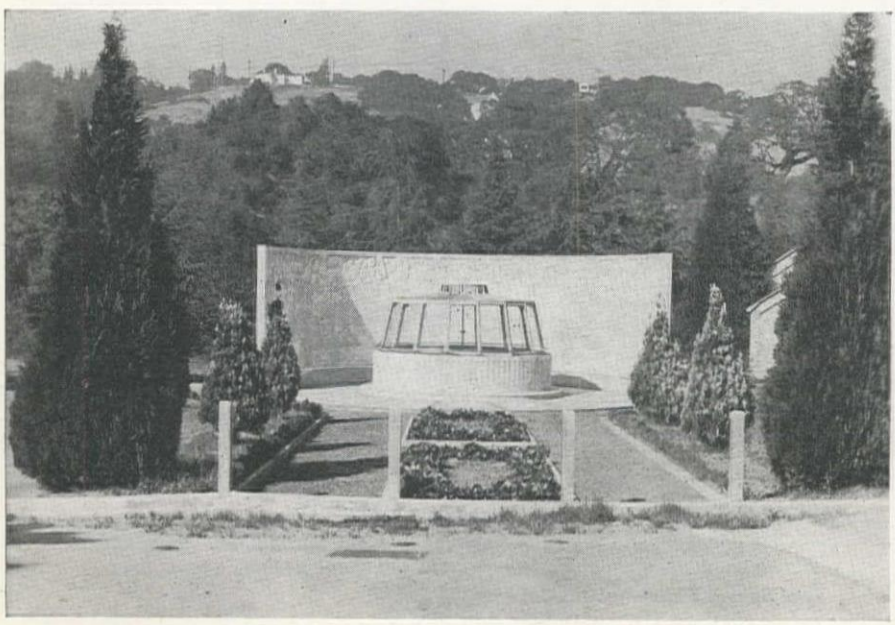
The San Pablo Plant is located in El Cerrito and receives its raw water from the San Pablo Reservoir by means of a two and one-half mile tunnel through the Berkeley hills. It is now going through its third construction stage. Originally designed by Allen Hazen, it was put into operation in July, 1920. Essentially, the plant consisted of a booster pumping station, an aeration basin, an over- and under-baffled channel for flocculation, two sedimentation basins operating in parallel, eight filter beds 18 x 30 ft. in size, a clearwater reservoir, and a washwater tank. Facilities were provided for the storing and feeding of chemicals for coagulation, but not for chlorination. The ultimate capacity of the plant originally was 18 mgd.

In 1930, the capacity of the plant was doubled by the addition of eight filter beds 20 ft., 4 in. x 30 ft. in size. In this new addition, the filter piping system was simplified by constructing bifurcated filter units. These units were designed and built as monoliths, each being 32 ft., 8 in. x 48 ft. overall, and providing a sand area of 1,220 sq. ft., divided into two equal areas by a center channel which serves both as influent and drain for the two halves of the filter unit. Five reinforced concrete wash troughs in each filter bed were placed at right angles to and opened into the center channel. Other improvements consisted of providing chlorination facilities, enlarging the main effluent pipe and locating it under the floor of the pipe gallery, raising the weir of the existing washwater troughs to permit a higher rate of wash, and increasing the height of the existing filters and sedimentation basin. Improved flow was obtained by installing a diffuser wall across the inlet end of each sedimentation basin. The design and construction work was performed by District forces.

The designers of the original plant undoubtedly planned for future enlargement, but to what extent is difficult to determine because the hydraulic characteristics were altered considerably in the 1930 construction. The plant is located on a side hill, and in order to fit the contour of the hillside, the axis of the clearwater reservoir is at an angle with the axis of the filter and pretreatment plants, which has complicated the planning of the present enlargement.

Because of the location and angular position of the clearwater reservoir, it is possible to add two filter units on the west side and only one on the east side of the pipe gallery. This unsymmetrical arrangement provided space for chlorine rooms and gave ample room in the pipe gallery for the washwater pumps.

A study of the plant hydraulics indicated there would be an appreciable loss of head between the sedimentation basin and the last filter. This loss is largely due to the tortuous route around sharp angle turns and through restricted openings. Although the present plans call for a capacity of over three times that of the original plant, the present conditions would have been improved by providing a more direct flow and larger openings. This could have been done at little or no extra cost in the original construction. The hydraulic study, based largely on field measurements brought to light excessive loss of head in the rate controllers. To readily detect such losses, manometer taps are being installed for



THE ATTRACTIVELY designed outlet structure through which the filtered water may be seen flowing over the 10-ft. diameter weir to the inlet of the Claremont Tunnel.

PHOTOGRAPH taken from the existing pipe gallery of the Orinda Plant showing new construction under way between the plant and chemical building in background.

each filter unit as previously described for the Orinda plant.

In order to keep the head loss at a minimum, a 54-in. main effluent pipe was installed with an improved alignment, and the outlet structure in the clearwater reservoir altered to give improved hydraulics and better control.

The space provided in 1930 for the chlorine equipment proved to be inadequate, and it was removed during the early stages of present construction. Although the available area is decidedly limited, it is believed that satisfactory chlorination facilities have been planned. Two rooms, 8 ft., 6 in. x 6 ft., 3 in., and 8 ft., 6 in. x 16 ft., 3 in., will house two chlorinators and two one-ton chlorine tanks, respectively. Between the two rooms is a large window so that the operator can see the dials and automatic recorders on the scales in the storage rooms from the chlorinator room. The latter room opens off the filter gallery.

Plant operation will be made easier by the installation of a 52½ x 34-in. venturi meter in the main effluent line; providing the larger and more modern chlorination facilities; installing all water and control piping two inches and under of copper; and providing more room in the pipe gallery by a neater arrangement of filter piping.

Because the existing filtration capacities in the entire system are limited, it has been necessary to schedule the work in such a manner as to allow the existing plant to operate throughout the construction. A total of four shutdowns will be sufficient to complete the work and put the entire plant in operation.

The design of the filter units and piping is practically identical with the Orinda plant, the only difference being a slight variation in overall dimensions.

In order to take advantage of the increased filter area, it will be necessary to make extensive alterations in the pretreatment end of the plant. Tentative plans call for an enlarged booster pumping plant, larger aeration facilities, the elimination of the baffled mixing channel, and extensive alterations in the sedimentation basins. A "flash" type chemical mixer, and flocculation tanks providing a minimum of 20-min. detention, will take the place of the existing baffled channel. Additional chemical facilities are contemplated to feed chlorine and activated carbon, or copper sulfate, as pretreatment chemicals whenever the condition of the water requires such treatment. When these improvements have been completed, it is believed that an efficient and modern plant will be available to provide safe water to the East Bay area.

The plans for both filter enlargements were prepared by the engineering staff of the East Bay Municipal Utility District. The construction work on the San Pablo Filter Plant is being done by Fred J. Early, Jr. Company, and that at the Orinda Filter Plant by DeLuca and Son, both of San Francisco.

TABLE I

Filter Plant	Nominal Capacity mgd	Nominal Capacity Plus 50% Overload mgd
Orinda	28	42
San Pablo	24	36
Upper San Leandro	18	27
Chabot	4.5	6.75
Grant Miller	2.0	3.00
Total	76.5	114.75

TABLE II

PERTINENT DESIGN DATA ON PRESENT EXTENSIONS

Design Data	San Pablo	Orinda
Ultimate design rate of filtration, in MG per acre per day	187.5	187.5
Number of filter beds in existing plant	16	16
Number of filter beds being added	6	24
Total area of filter beds, in square feet	12860	24400
Ultimate plant capacity, in MGD	55	105
Depth of filter sand, in inches	34	34
Depth of gravel, in inches	18	18
Effective size of filter sand	0.54	0.54
Uniformity coefficient of filter sand	1.58	1.58
Rate of wash of rise per minute, in inches	36	36*
Clear distance between wash-water troughs, in inches	46	46
Distance from top of sand to trough weir, in inches	35	35
Overall depth of wash-water troughs, in inches	28	28
Velocity of flow at ultimate plant capacity, in feet per sec.:		
Raw water channel	2.3	1.28
Influent sluice gates	2.03	2.03
Velocity of flow in filter under drains at 36" wash, in feet per second:		
Entrance to collector pipe	7.14	7.14
Entrance to laterals	6.57	6.57
Through pipe perforations	18.25	18.25
Ratio of area of perforations to area of lateral	0.36	0.36
Ratio of area of perforations to area of main collector	0.396	0.396
Ratio of area of laterals to area of collector	1.11	1.11
Ratio of area of total perforations to total filter area	0.0029	0.0029
Total head available for operating filters, in feet	15.5	14.3
Elevations		
Flow line in filters	246.00	373.30
Maximum elevation in sedimentation basin	247.00	—
Floor of filters	236.00	363.00
Weir of wash-water trough	243.25	370.25
Top of filters	248.00	374.00
Floor of pipe gallery	229.57	356.58
Floor of waste-water channel	230.33	356.25
Floor of raw-water channel	239.17	364.00
Operating floor in filter gallery	244.00	374.00
Center line of main effluent pipe	225.00	352.50
Center line of rate controller	231.35	358.35
Center line of wash water pumps	230.16	359.43
Center line of wash water line	238.86	365.86
Effluent weir control in clear water reservoir	231.50	359.00

*Wash water facilities designed to accommodate 42" wash rate.

Tacoma Doubles City Water Supply By Second Puyallup River Crossing

EXCAVATING THE TRENCH on 50 per cent slopes was accomplished by a bulldozer attached to a tractor anchored at the top of the slope. After making each downhill pass, the bulldozer was pulled up by the cable winch on the anchored tractor. The new line parallels the existing pipe crossing the Puyallup Valley, with similar diameter.

Support of 39-in. all-welded steel pipe across 7,000-ft. siphon, 1,400 ft. of which is marshy bottom, and 440 ft. of which is on a bridge, tests the engineering and ingenuity of municipal waterworks engineers in Washington city

GRADUAL RECONSTRUCTION of the main domestic water transmission line into Tacoma, Wash., by late last summer had so increased pressures in the lower portions of the line that it became necessary to enlarge the capacity of the 7,000-ft. siphon which crosses the lower Puyallup Valley just east of the city. Aside from the problem of constructing an adjacent line without disturbing the existing line, which provides the only source of water supply to the city and had to be maintained in service, construction problems included establishment of a firm foundation across 1,400 ft. of marsh, as well as lowering the ground water level during construction, and providing for movement of the pipe on a 440-ft. bridge across the Puyallup River without resorting to the use of expansion joints.

The original Green River gravity system, through which the city is supplied with water, was completed in 1913. For the most part the line was constructed of wood stave pipe, and for the past 23 years replacement of the line has been in progress as short sections of the wood pipe deteriorated. In the replacement program the pipe size has been increased in most instances, hydraulic gradient has been improved, and length decreased, with the result that the capacity of much of the line has been greatly increased.

First Puyallup Valley crossing

By the summer of 1946 line improvements above the Puyallup Valley crossing had increased the pressure in the original pipe line to a point where it was felt that additional capacity must be provided to reduce the pressure or a serious break might occur in the line. The original line across the valley is a 39-in. diameter, ½-in. steel riveted pipe, operating under a head of more than 500 ft.

About 1,400 ft. of the 5,700-ft. valley width consists of marsh, across which the original line is supported on a pile trestle. The water table is at, or nearly at, ground level across the entire valley.

Near the eastern side of the valley the line crosses the Puyallup River on a through steel truss bridge consisting of one 200-ft. and two 120-ft. spans. The existing line occupies about a half of the

12-ft. bridge width, leaving room for the new line beside it. On each side the valley is bounded by hills about 400 ft. high, rising on slopes of about 58 to 72 per cent.

Duplicate crossing

In planning the second valley crossing it was decided to use all-welded steel pipe of the same diameter as the first crossing. Specifications for two types of field joints were provided as alternates, but the final decision was in favor of the butt strap, as opposed to the die-formed bell and spigot type. The butt strap adopted is ⅜ by 4 in., shop welded to one end of each pipe section before delivery of the pipe.

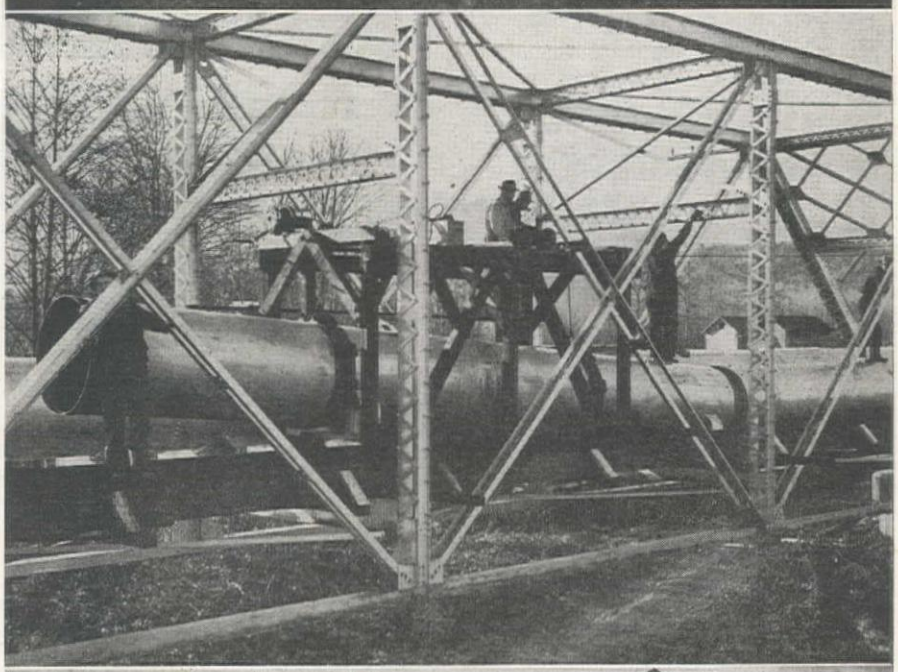
Two field welds are required for each joint, one inside and one outside the pipe, plus plug welding of the joint test holes drilled through the strap. Provisions for individual testing of each joint require the drilling of a ¼-in. hole tapped with ¼-in. standard thread on each side of the butt strap 1 in. from centerline. Each joint is tested with 40 lb. per sq. in. air pressure prior to backfill of the pipe.

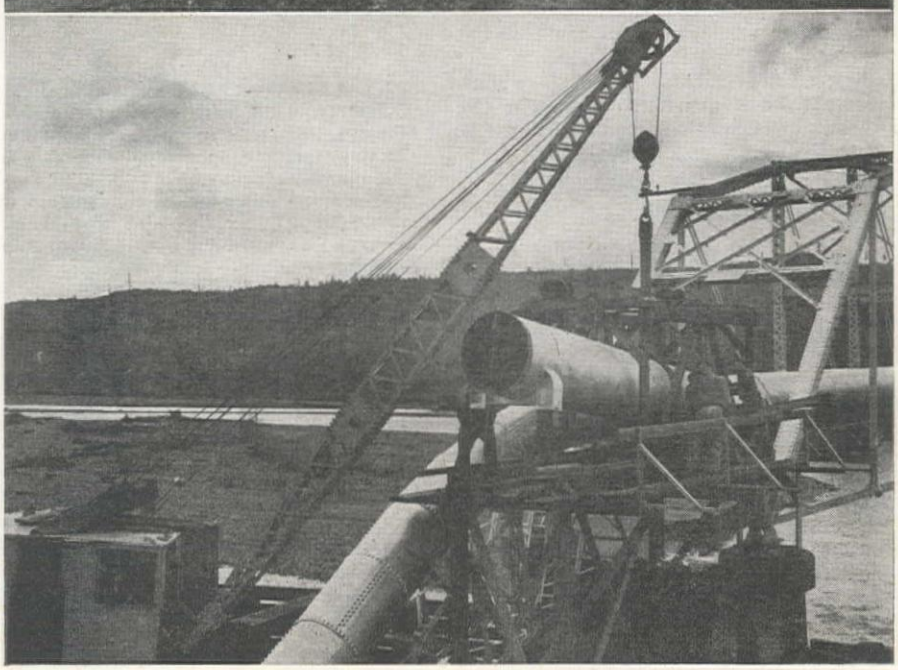
About every 1,000 ft. a special slip joint is provided to eliminate stresses which may build up during construction of the line. These joints, consisting of a ½ by 10-in. butt strap, are left unwelded until the line is placed, welded, and backfilled to the next slip joint. During this period the pipe attained ground temperature which averaged about 52 deg. during the construction period. With a 2-in. overlap on the shop welded end of the butt strap, about 8 in. of the free end remains available to movement until construction of the line has reached the next succeeding slip joint by which time the pipe has reached ground temperature, and movement is presumed to have ceased.

Pipe is delivered to the job in 32-ft. lengths, and welded at a field assembly yard to 64-ft. lengths which are placed in the trench. All underground sections are coated with coal tar enamel inside and out, and double wrapped outside. Above ground sections are aluminum painted outside and coal tar enameled inside.

Unwatering trench line

The first major problem in construction of the line in the valley was to provide a sufficiently stable foundation to carry the pipe across the 1,400-ft. marsh section. The existing crossing is carried above ground on concrete saddles cast on timber pile trestle. In designing the new line it was decided to place the second line below ground. To accomplish this without damage to the adjacent existing line required extreme care during all phases of construction,





WELDED PIPE sections, 64 ft. in length, were drawn to the trench on padded timber sled to prevent damage to coated and wrapped pipe, top; dolly for placing pipe on bridge operates on steel rails on temporary timber girders, while it is pulled by one winch and maneuvered vertically by two others, one at each end, center; pipe saddles with roller nests were constructed on the pipe before assembly on the bridge.

but particularly during excavation of the trench.

Unwatering of the trench area was undertaken first. Sumps were excavated on 400-ft. centers along the line, and to about 14-ft. depths, which would be about 7 or 8 ft. below the future pipe invert. Pumps were then placed at the sumps and operated over periods of two to four days before the water table was lowered sufficiently to permit excavation of the trench to begin.

Besides the marsh section, this dewatering treatment was required across about half of the entire valley floor. In all eight pumps were used with a total capacity of 220,000 gal. per hr. Getting the water far enough downstream to prevent its re-entrance to the trench area proved to be something of a problem also. Using surplus army pipe with a quick-fastening coupling, it was necessary to use discharge lines extending as much as 600 ft. downstream from the pumps in some instances.

Stabilization in marsh

Excavation of the trench was done largely by dragline, but a considerable amount of hand labor was required when the machine encountered driftwood buried in the alluvial material comprising the valley floor. A number of large logs had to be chopped out with hand axes in order to complete the excavation.

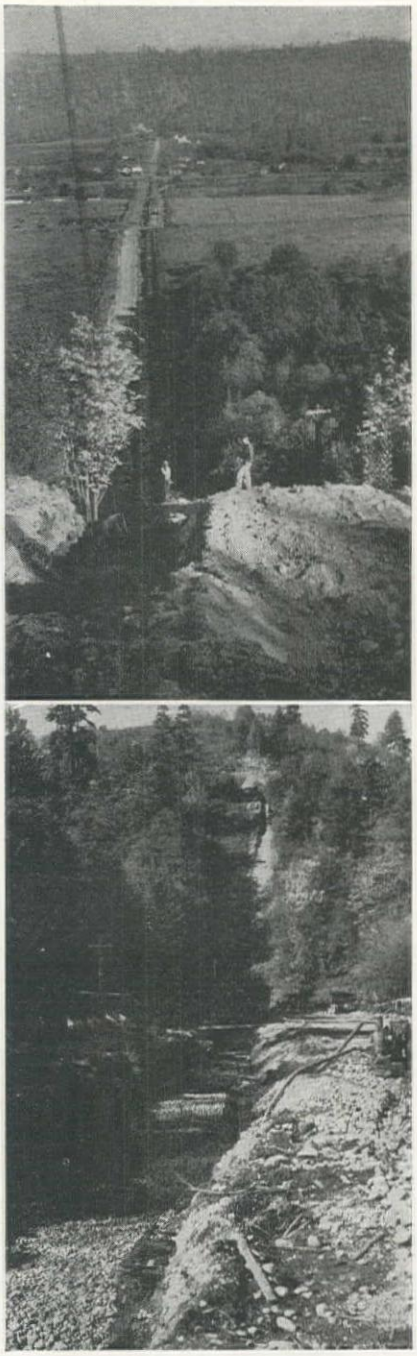
Upon completion of the excavation in the marsh 2 to 4 ft. of bank run gravel was placed in the bottom of the trench to form a supporting bed for the pipe. Although the water table elevation rose above the pipe as soon as pumping had been discontinued at the sumps, it is believed that the gravel envelope surrounding the pipe (backfill of the trench was also made with bank run gravel) will provide sufficient support for the line.

Excavation of the trench on the 58 to 72 per cent slopes on both sides of the valley also proved to be something of a problem. The first, and unsuccessful, solution was the use of a dragline bucket operated at the end of a cable powered by a tractor winch anchored at the top of the slope. However, the bucket alone did not have sufficient weight to dig into firm spots in the ground or maintain proper alignment. The excavation was completed by the use of two tractors.

An RD-7 with winch was anchored to deadmen at the top of the slope. A D-4 equipped with a hydraulic bulldozer was fastened to the free end of the cable, and after having made a pass down the slope in the trench was pulled backward to the top of the slope by the winch on the anchored tractor.

River span

It was felt that it would be desirable to eliminate if possible the use of any expansion joints in the pipe itself. The maintenance of expansion joints is considered impractical and the use of joints generally unsatisfactory. As an alternate, a system of rollers has been devised to permit differential movement between the bridge and the pipe without setting up stresses either in the pipe or in the truss members.



PUYALLUP VALLEY, at crossing site, is 5,700 ft. wide, with river at far side. First 1,400 ft. is marsh, which had to be dewatered, top; sumps were dug in the marsh section every 400 ft. to draw the ground water below the bottom of the trench, lower. Existing pipe (background) is supported on timber mud sills here.

The support of the pipe on the bridge consists essentially of a series of roller bearing steel saddles at all points of support, plus a hinged strut at one end of the bridge and a roller bearing steel saddle on a concrete support at the other. The steel saddles are made of ⅜-in. plate 10 in. wide extending around a little more than half of the pipe circumference.

A ⅜-in. plate, cut to fit the saddle plate, is welded to it, perpendicular to the axis of the pipe. The width is about 49 in. at the bottom, narrowing 15 in. below the horizontal centerline of the pipe on a 10-in. radius to its junction with the pipe saddle.

The roller bearings are placed in nests, one on each side and immediately below this web plate. They are boxed by ⅜-in. lateral plates, or flanges, running down the exterior edges of the web plate from the pipe, and a second set of plates welded to each side of the web 9 in. inside the exterior edges. The roller nest consists of two 2-in. diameter by 8-in. long rollers mounted 2¼ in. center to center, on a ⅜-in. by 1½-in. plate, and reinforced fore and aft of the rollers by ½-in. round rods.

Beam treatment

The pipe saddle is completed by a horizontal ⅜-in. plate welded to the bottom of the web plate between the roller nests. Over the roller nests ¾-in. plates are used. One of the accompanying drawings illustrates most of the details described briefly in the foregoing paragraphs.

Existing beams of the truss are 15-in. by 42-lb. I-beams. Roller bearing plates on the top flanges are 15 x 7½ in. plates varying in thickness from ½-in. to 2-9/16-in. depending on the grade of the beam on which it is to be placed. Plates are welded on four sides to the top of the upper flange. On these bearing plates guides for the rollers are provided by welding 7½-in. sections of 1½ x 2 x ⅜-in. angles longitudinally on each side of the roller positions. At intervals across the span these roller guides are reinforced by using ⅜-in. plates 10 in. high, reinforced by ⅜-in. gusset plates.

Since the roller bearing plates extend over both sides of the beam flanges, and as a means of increasing the strength of the beams, web stiffeners were added to the I-beams under each roller nest. Centered under each roller nest, the stiffeners are ⅜-in. plates 15 in. long, welded to each side of the I-beam web from top of top flange to top of bottom flange, and with a maximum width equal to the length of the roller bearing plate extension over the beam flange.

A special strengthening was applied to floor beam No. 1 at the east end of the bridge. Here a 6 x 5-in. tee, cut from a 12-in. by 31.8-lb. I-beam, was placed underneath to provide added support for the existing beam. At this point, too, a steel saddle and sets of rollers have been installed on the existing riveted line to replace the wooden saddle at this point. Over the remainder of the river crossing the wooden saddles were left in place on the existing line.

Hinged strut

To provide for the transition section of the pipe line from bridge to underground, a special hinged strut was designed and constructed at the east end of the bridge. At this point the existing pipe line is carried on a light truss to relieve the stress on the first floor beam of the bridge. The use of the rollers combined with the hinged strut on the new pipe line will eliminate the creation of any new stresses at this point.

The strut is supported on a reinforced concrete pier 6 ft. wide by 2 ft. long by

7 ft. high on a 7 x 7 x 2-ft. footing. Reinforcing is uniform on both sides of the pier, and top and bottom of the footing. Two pin connections are anchored in the top of the pier to carry the strut.

Two wide-flange columns, 6 x 6-in. by 20-lb. sections, comprise the strut. The columns are spaced about 43½ in. between flanges, and connected by a full ⅜-in. plate. The lower ends of the columns are furnished with connections to 3-in. diameter by 12-in. pins, and the upper ends are slightly rounded and covered with a ¾-in. plate 6 x 50 in., rounded over the shorted dimension on an 11-ft. radius. The top plate edges are rounded off so that the strut ends in a rocker form.

The pipe saddle is supplied with a sleeve which slips over the strut and extends down the strut for a distance of 16 in. The sleeve is slightly belled, being 8 in. wide at the point of contact with the strut and 10 in. wide at the bottom. The sleeve is formed from two ½-in. plates 52 x 16 in. and two 16 in. long with width varying from 8 in. at one end to 10 in. at the other. The pipe saddle is similar to those used at the roller supports, but uses two webs instead of one, and does not have the intermediate stiffeners.

CONCRETE PIER at east end of the Puyallup River bridge will eventually support a hinged strut and permit deflection in the line between the bridge abutment and the sub-surface section. Strut and rollers will eliminate stress on bridge floor beams.

Placing pipe on bridge

At the other end of the bridge the pipe is carried off to a concrete pier on which the pipe is set on rollers in the same manner as on the bridge. The pier is 6 x 2½ ft. by 10 ft. high on a 10 x 10-ft. by 20-in. footing. The pipe rollers rest on the top of the 10-ft. height, but above this the pier continues to rise in a 12-in. section width to form a U section with the pipe passing through the bottom of the U.

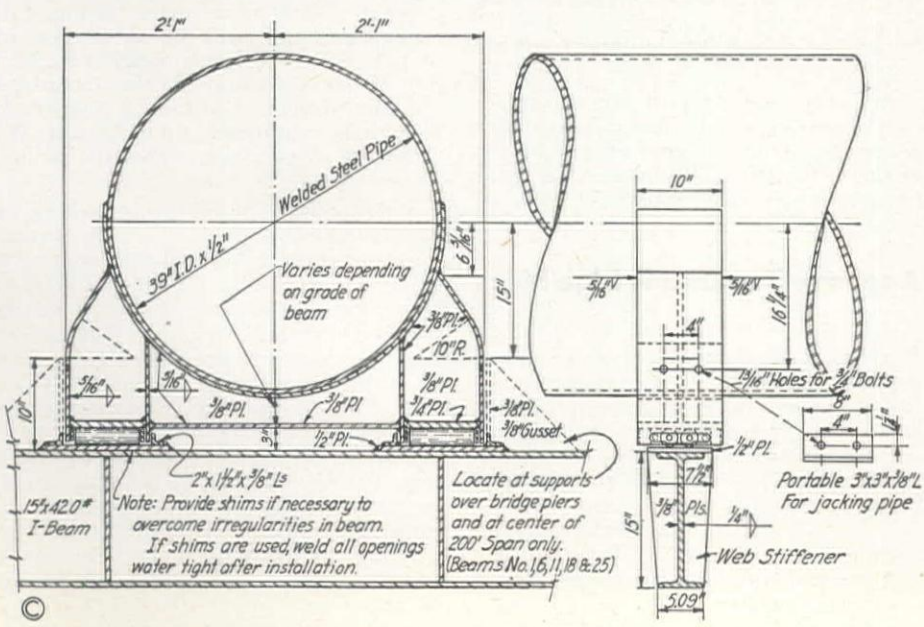
In placing the pipe in position on the bridge a special dolly was used. The dolly was developed originally by the water division some years ago for construction of other sections of the line. It consists of a timber frame mounted on flanged wheels. Both ends of the dolly are essentially A-frames, and are connected by bracing at the top and both sides, the bottom being left open for lowering pipe sections. Hand winches are mounted atop the A-frames at both ends.

Steel rails were laid the length of the bridge on temporary timber girders placed on each side of the pipe center line. An extension of the temporary trackage past the east bridge abutment provided space for loading the dolly with the aid of a crane working on the ground. A 32-ft. pipe section was swung under the dolly by the crane where special slings suspended from the dolly's hand winches took over the load.

The dolly with the pipe slung underneath was pulled by attaching a line to a 1½-ton truck at the other end of the bridge, to the approximate placing position. By maneuvering the two winches on the dolly to raise or lower each end of the pipe and moving the dolly and pipe forward by hand into the pipe section previously placed, the pipe was worked into exact position, and held while the butt strap was tack welded.

To permit final adjustment of the pipe grade on the bridge, the pipe could be jacked above its final position. Provisions for this movement were made by drilling holes in the outer flanges of the pipe saddles, and bolting an 8-in. section of 3 x 3 x ⅜-in. angle horizontally to the flanges on each side of the roller assembly. Jacks placed on the floor beams under the angles would then be used to raise the pipe while the roller bearing plates, shimmed up if necessary for correct grade, were placed and welded into their final position.

PIPE SADDLES with roller nests are used over every floor beam of the bridge with two exceptions, and on the pier at the west end of the bridge, making 24 such installations. Welded steel pipe was used throughout, and the saddle units were also welded.



Cutting into service

Construction of the duplicate Puyallup Valley crossing was begun about Sept. 1, 1946, and will be finished early in the spring of this year. All of the work on the valley floor, except a few finishing touches on the river crossing, was completed just before the high water on December 11th which flooded the valley. Installation of the pipe on the slopes has been in progress since then.

Final testing calls for the line to be subjected to a pressure 50 per cent greater than the computed operating pressure at the highest point of the installation.

In cutting the new line into the existing line a 1½ x 8-in. steel plate will be welded to the exterior surface of the 52⅝-in. o. d. main line to form a ring into which the 40-in. o. d. line will fit. After the new line has been welded outside, the resulting vee junction will be encased in a concrete anchor.

With both junctions complete, service in the line will be shut off for a few hours, probably not to exceed 12 hr. Then the openings into the main line

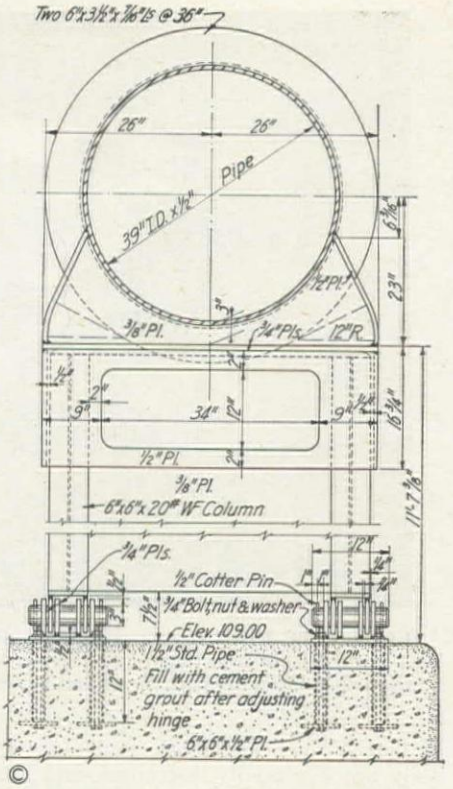
can be cut from inside the new line, and the duplicate crossing will be ready for service.

Organization

The duplicate Puyallup Valley crossing was designed and is being constructed under the direction of the personnel of the Water Division, Department of Public Utilities of the City of Tacoma. C. A. Erdahl is commissioner of the department of Public Utilities.

W. A. Kunigk is superintendent and chief engineer of the water division. Lathrop Crosby, as chief assistant superintendent, was primarily responsible for the design of the duplicate Puyallup Valley crossing, and J. A. Kuehl, resident engineer, is directly in charge of all phases of construction.

Due to the danger of disturbing the existing line while working in the soft ground of the valley, most of the excavation and line construction has been performed by workmen of the water division. Field welding has been carried out by the Bond Welding Co. of Tacoma, under an $8,202 contract. Hauling and placing of 14,400 cu. yd. of bank run gravel in the trench, including backfill, was performed under a $12,250 contract by the Rainier Construction Co. of Tacoma. Pipe was supplied by the Steel Tank & Pipe Co. division of the American Pipe & Construction Co., Portland, under a $133,199 contract. The total estimated cost of this improvement is $275,000.



HINGED STRUT at the east end of the river crossing acts as a rocker, supporting the pipe, yet permitting deflection of the line as temperature changes occur. Fixed hinge supports can be seen cast in place in the concrete pier in picture on preceding page.

Department of Commerce Sets 1947 Construction Goal at 15 Billions

NEW CONSTRUCTION during December amounted to $909,000,000 and for the year totaled $10,131,000,000, the Construction Division, Department of Commerce, said in its final report on 1946 building activity.

The December 1946 total was more than double that for December 1945, and the 1946 yearly total was two-and-one-fifth times greater than 1945.

Total private construction for Dec. 1946 was $691,000,000 and public construction amounted to $218,000,000. Private residential construction, excluding farm, totaled $300,000,000 for the month and private nonresidential construction totaled $299,000,000. In the public category, residential construction during December was valued at $57,000,000 and nonresidential at $23,000,000. Military and naval construction was valued at $14,000,000 and highway construction at $75,000,000.

For the entire year, $7,868,000,000 was spent in private construction and $2,263,000,000 in public construction, the Department said. A total of $3,303,000,000 was spent on private residential construction. Private industrial construction amounted to $1,699,000,000 and $851,000,000 was spent by privately-owned public utilities.

In the public category, $379,000,000 was spent on residential and $317,000,000 on nonresidential construction during the year. Military and Naval construction amounted to $185,000,000; highways, $829,000,000; conservation and development, $242,000,000; and construction of sewer and water systems $194,000,000.

In comparing 1946 construction with 1945, the Department of Commerce said that the greatest percentage increase was in the private construction of warehouses, office and loft buildings, up 500 per cent over 1945.

In a subsequent report, the Construction Division stated that it anticipates a new construction goal at $15 billion during 1947, with $7 billion to be spent on maintenance and repair.

Approve Tacoma Bridge Piers

ORIGINAL PIERS of the Tacoma Narrows bridge in Puget Sound have received the approval of engineers making an examination for insurance underwriters preparatory to setting an insurance rate for the structure which the Washingon State Toll Bridge Authority hopes to rebuild. When insurance underwriters have determined the rate, the authority expects to call for financing and construction bids for the $8,500,000 suspension bridge.

Outlook Good for Seattle Building

BUILDING CONSTRUCTION in Seattle will take an upswing this year, if all plans announced during the past month are brought to the construction stage during the year. Plans for major structures amounting to nearly $25,000,000 have been publicly announced, and the greater proportion of these appear to be quite definitely scheduled. A number of additional projects have been announced, but appear to be more or less uncertain.

Largest group of projects is one of ten buildings for the University of Washington to cost an estimated $9,207,000. All of these have been approved by the Civilian Production Administration for immediate construction, and plans are being rapidly completed by various Seattle architects under the direction of John Paul Jones, supervising architect. Largest single project in the group of ten is a $3,000,000 first unit for a health science center. Two others, an administration building, and additional wings to two buildings are in the $1,000,000 class.

Final plans are being prepared for the city's public safety building and are expected to be complete by late summer. Whether or not the city will proceed with the construction of the $5,500,000 structure this year has not been announced.

Gibbs & Hudson, Inc., have announced a $2,500,000 business district development to include a 4-story garage, a business building, a clinic building, and an apartment hotel to be 12 stories high and cost $1,800,000. Of the four structures only the garage and the business building will be undertaken this year, and then only if CPA grants approval.

For the Lake Burien Heights Holding Corp., Nettleton & Baldwin, Seattle contractors, have begun construction of a 44-building apartment group between SW 136th and 140th Streets. All buildings will be of frame construction with concrete foundations, cedar siding, full basements, and will be 2 stories in height. Total cost is estimated at $4,500,000. Miller & Ahlson are the architects on the project, Gardner, Gardner & Hitchings, engineers, and Edwin W. Grohs & Associates, landscape architects.

Metropolitan Building Co., lessee of the University of Washington downtown property, announced tentative plans for replacement of the White-Henry-Stuart building with a modern skyscraper type of business block, as well as replacement of several other major structures on the property. However, Metropolitan and the regents of the University are not in complete agreement as to whether the former's lease is to be extended over a sufficient length of time to permit depreciation of such a building program cost, or whether the lease is to be terminated and the property managed by the board of regents.

TWA Builds New L. A. Nose Hangar

Combination office-hangar avoids waste space and construction cost but protects personnel working on motors and fuselage

AMONG THE FIRST peacetime structures embodying the economical approach to the maintenance problems of commercial airlines is a combination office, shop building, and nose hangar. Such a building is now under construction at the Los Angeles Municipal Airport by the Transcontinental and Western Air, Inc. The general arrangement was planned by the owner, "T.W.A.," and the Donald R. Warren Co. designed and prepared the working drawings and made the foundation investigation. The A. S. Vinnell Co., Inc., (Building Division) is the general contractor.

It is recognized that since aircraft are subject to the severest of weathering while in flight, they do not require enclosure while grounded. The nose hangar avoids the expense of the waste floor space and huge doors characteristic of full hangars, while protecting service personnel working on motors and fuselage. The moderate year-round temperatures of Southern California impose no hardship on service personnel, making the nose-type hangar particularly applicable to this area.

Office and shop facilities are provided in a two-story concrete building, 35 ft. wide and 425 ft. long. The hangar portion consists of a canopy, of steel truss and fluted sheet-metal panel construction, which cantilevers from the concrete building for its entire length. The canopy is 50 ft. in width, and affords a headroom of 27 ft.

To permit full flexibility for modification to departmental functions, both floors of the office and shop building are clear-span for their full width of 35 ft. All partitions are non-bearing and removable. Among the numerous operations housed in this structure are: communications, ready rooms, pilot rest rooms, hostess rest rooms, training area, repair storage, shop, garage, kitchen, and commissary.

Canopy installed later

Due to headroom requirements and depth of truss, the roof of the canopied area is eleven feet higher than that of the concrete building. Lines of sash are installed above bottom chord level to admit additional light to the work area. During the design period, structural steel was critically scarce. For this and other economic reasons, the design permitted full initial completion and occupancy of the office building, the canopy steel to be set at any time it was available. Each canopy truss contacts the concrete building at but two points; a bearing corbel on the supporting concrete columns, and a tie-back anchorage at the opposite side of the office building roof. Should future major operational changes require, dismantling and salvage will be thereby greatly facilitated.

Architectural treatment is simple, but attractively modern. Certain general characteristics of line and color were adopted to blend with those of other privately and publicly owned buildings at the airport. Ample scope, however, was permitted the owner's individual preference, resulting in the development of an interesting as well as functional structure.

The planning by the "T.W.A." was under the direction of J. S. Bartles, regional manager, and Charles L. Lundblad, senior engineer. The design of the project was handled by staff engineer James M. Fox and the architectural treatment by Milton Melzian, of the Donald R. Warren Co. Herbert Promfret is general superintendent and Bliss Oliver is engineer for the A. S. Vinnell Co., Inc. The complete project was designed to meet the requirements of the Los Angeles City Building Code.

Washington Orders Dust Collectors on Drilling

DUST COLLECTORS must be used on all dry rock drilling operations in the state of Washington in the future according to a special safety order issued last month by Dan Adair, supervisor of the safety division of the state department of labor and industries. Since 1938 a ruling of the department has required that all rock drilling in the state be done with wet heads. However, this has not been enforced on construction projects up to the present time. The beginning of large scale operations on the irrigation features of the Columbia Basin project provided the impetus for the division to study the problem further and issue the amendment, which will be strictly enforced, according to Adair. The special safety order reads in part, 'All dry rock drilling shall be performed with a dust collector of suction type capable of collecting dusts from the entrance of the drill hole and either discharging them at a point where they cannot enter the breathing zone of any workman . . . or separate and confine them within a closed receptacle so they cannot be discharged with the exhaust air into the breathing zone . . . Dust counts shall not exceed ten million particles per cu. ft. . . . within 6 in. of the collar of the drill hole and outside the suction hood . . . " Prior to issuance of the order tests were conducted by engineers of the safety division on the canal excavation job of Morrison-Knudsen Co. near Ephrata.

Six Mile Highway Impasse Requires 200-Mile Detour

A DETOUR more than 200 mi. long will be in use this winter on U. S. highway No. 2 in northwestern Montana. Union Construction Co. is rebuilding a 6-mi. section of the highway in Middle Fork Canyon just east of Belton and along the west boundary of Glacier National Park. In this area only two roads cross the Continental Divide, U. S. 2 and the "Going to the Sun" highway which crosses the park, but is not kept open during the winter season. Topography of Middle Fork Canyon will not permit maintenance of a detour around the construction work so the road will be closed to traffic for about three months this winter. During this period traffic between the Kalispell-Whitefish area and the Cut Bank-Shelby area will have to detour by way of Missoula, some 100 mi. to the south.

CAA Grants Funds for Small Airports

Loc. & Name of Airport	Class Pres.	Class Prop.	Sponsor	Funds Federal	Total	Proposed Work
ARIZONA						
Showlow Mun.	0	2	$ 5,220	$ 8,006	$ 13,226	Grading, paving
Tombstone Mun.	0	3	14,681	21,776	36,457	Land, grading, Adm. bldg.
Clifton-Morenci Mun.	2	3	121,173	185,827	307,000	Grading, paving, lighting, Adm. bldg.
Clemenceau-Cottonwood Mun.	1	3	45,390	69,610	115,000	Grading, lighting
Williams Mun.	1	3	15,788	24,212	40,000	Grading
Holbrook Mun.	2	2	9,078	13,922	23,000	Paving
Mesa, Falcon Field	1	3	28,150	43,170	71,320	Paving, lighting
Bisbee Mun.	2	2	1,500	2,300	3,800	Adm. bldg.
Chandler Mun.	0	2	15,197	16,103	31,300	Land, grading, lighting, Adm. bldg.
CALIFORNIA						
San Jose Mun.	1	3	115,187	107,313	222,500	Drainage, runway paving & apron
Santa Ynez Mun.	0	2	62,613	57,990	120,603	Land, runway paving, & Adm. bldg.
Santa Cruz Mun.	0	1	45,205	29,795	75,000	Grading, land, fencing & marking
Del Mar Mun.	1	2	12,233	14,367	26,600	Grading, paving, lighting, land, Adm. bldg.
Calexico Mun.	1	3	148,768	141,212	289,980	Adm. bldg., land, grading, paving, lighting
Merced Mun.	3	3	10,063	11,870	21,933	Paving apron & taxiway, landscape
San Luis Obispo Co.	3	3	12,846	15,154	28,000	Grading
Avenal	2	2	23,629	27,871	51,500	Paving runway, lighting, Adm. bldg.
Los Banos Mun.	2	2	11,470	13,530	25,000	Grading & paving runway
Three Rivers	0	1	1,875	625	2,500	Land
Quincy-Gansner	0	2	22,940	27,060	50,000	Grading
Big Pine	0	1	2,667	3,146	5,813	Grading
Sonora-Columbia	1	2	14,739	17,386	32,125	Grading, lighting
Wasco	1	1	23,346	18,654	42,000	Land, grading, paving, Adm. bldg.
Pixley	0	1	6,000	2,000	8,000	Land
Orange Cove	0	1	15,698	5,232	20,930	Land
Amador Co.	0	1	20,967	24,733	45,700	Grading, paving, lighting, util.
San Rafael, Greenbrae	0	1	60,000	20,000	80,000	Land
Brawlay Mun.	2	2	88,575	88,925	177,500	Land, grading, paving
Calipatria Mun.	2	2	21,380	25,220	46,600	Grading, paving
Tulare Airpark	1	2	11,250	3,750	15,000	Land
Borego Valley	0	2	23,368	12,332	35,700	Land, paving
Fullerton Mun.	1	1	15,154	12,846	28,000	Land, paving, lighting, Adm. bldg.
Kern Co.-Shafter	0	1	45,698	27,249	72,947	Land, grading, paving, Adm. bldg.
Modesto Mun.	3	3	57,011	38,689	95,700	Land, grading, paving, Adm. bldg., lighting
Cedarville Mun.	0	1	1,800	600	2,400	Land
Adin Municipal	0	1	562	188	750	Land
Dunsmuir Mun.	1	2	9,176	10,824	20,000	Grading
Hanford, Kings Co. No. 1	0	2	76,034	50,656	126,690	Land, grading, paving, Adm. bldg.
Tehachapi	3	3	28,053	33,197	61,250	Paving, grading, lighting, Adm. bldg.
Los Alamos	0	1	5,388	3,078	8,466	Land, grading
Carpinteria	0	1	47,521	50,979	98,500	Land, grading, Adm. bldg.
Lone Pine	0	2	5,505	6,495	12,000	Grading
COLORADO						
Canon City, Fremont Co.	2	3	19,973	20,827	40,800	Land, develop landing area
Craig Mun.	1	3	59,913	62,112	122,025	Land, Adm. bldg.,
Durango, La Plata Co.	3	3	60,427	61,298	121,725	Land, Adm. bldg.
Montrose	3	3	23,404	20,866	44,270	Land, office bldg.
Grand Junction Mun.	3	3	38,700	44,300	83,000	Develop landing area
Grand Junction Mun.	3	3	81,500	92,500	174,000	Adm. bldg., apron paving
Pueblo Mun.	3	3	38,635	44,165	82,800	Apron, develop landing area
Longmont Mun.	2	1	41,858	47,851	89,709	Apron, develop landing area
Julesburg Mun.	1	1	16,248	16,752	33,000	Land, develop landing area
IDAHO						
Twin Falls	2	3	305,203	387,905	693,108	Land, grading, drainage, paving, lighting, Adm. bldg., & access road
Burley Mun.	2	3	64,410	79,590	144,000	Land, taxiway & apron paving, Adm. bldg.
Cascade Mun.	0	2	8,079	6,841	14,920	Land, grading, markers & entrance road
Bonners Ferry, Boundary Co.	0	1	11,250	3,750	15,000	Land
Craigmont Airport	0	1	13,647	10,376	24,023	Land, grading, seeding, markers and drainage
St. Maries' Memorial	1	2	9,609	11,691	21,300	Land, grade, drain & turf landing strip, fencing, apron paving, access road
Driggs, Teton Peak's	0	1	7,070	8,739	15,809	Land, grading, drainage, lighting, fencing, Adm. bldg., and utilities
Riggins, State Emergency	0	1	5,318	5,432	10,750	Land, clearing, grading, drainage, fencing, marking, access road
Rexburg Mun.	1	2	10,000	10,000	20,000	Land, clear, grade, drain, fence, lighting, apron paving, Adm. bldg., utilities, access road
Ashton	0	1	9,472	7,921	17,393	Land, landing strip, access road
New Meadows	0	1	7,172	8,453	15,625	Land, land. strip, fencing & marking
Blackfoot Is.	0	2	44,168	52,372	96,540	Land, landing strip, paving, lighting, Adm. bldg., access road, utilities
Albion Mun.	0	1	5,264	5,936	11,200	Land, landing strip, Adm. bldg., access road

"Sliding Scale" modified—Federal share of costs to be fifty per cent to 5 million—twenty per cent guaranteed regardless of port size—Projects for western states in seven year program named

REGULATIONS for administering the Federal Airport Act have been approved in final form, according to T. P. Wright, Administrator of Civil Aeronautics.

"The public hearings on the regulations, held late in October, produced scores of valuable suggestions," Mr. Wright said. "Every criticism and suggestion made at the hearings was carefully considered . . . "

The hearings revealed widely-divergent viewpoints between large and small cities over a proposed "sliding scale formula." Under this formula, as originally proposed, the Federal share of airport costs would have been 50 per cent on project costs up to $2,000,000, and would then have decreased progressively.

Some large municipalities asked that the formula be eliminated entirely, and that the Federal government pay a flat 50 per cent of project costs regardless of the size of the project. Representatives of smaller towns, on the other hand, pointed out that available funds are limited and expressed fear that with the formula eliminated, one or two large projects would use up all the funds available in a particular state.

To protect both large and small-town interests, it was decided to keep the sliding-scale formula, but to permit the Federal government to pay 50 per cent on all project costs up to $5,000,000 instead of $2,000,000. The Federal share on project costs of more than $5,000,000 will decrease by 5 per cent with each additional $1,000,000 of cost up to $11,000,000. The minimum Federal contribution, regardless of airport size, will be 20 per cent.

It was decided that municipalities accepting Federal aid under the act may not make exclusive contracts on the sale of gasoline, repair services, and charter operations. Although landing fees for private aircraft are frowned upon by the CAA, such fees are not prohibited in the final draft of the regulations, because the CAA regards operation of airports built with Federal assistance to be the exclusive responsibility of the sponsors.

The Federal Airport Act, passed by Congress in May, 1946, authorizes a seven-year airport building and improvement program. The act authorizes Federal expenditures totaling $500,000,000 during the seven years. Of that amount, $45,000,000 has been appropriated for the fiscal year ending June 30, 1947.

Eight Hundred Airports Financed for 1947 Work

T. P. WRIGHT, Administrator of the Civil Aeronautics Administration, has just announced the first year's Federal Aid Airport Program. It calls for construction or improvement of 800 airports, at an estimated cost to the Federal Government of $33,899,265, with local or state government sponsors providing an additional $37,692,600.

The proposed Federal expenditures include $26,676,466 from amounts apportioned among the states on the basis of their area and population as provided in the Federal Airport Act, plus $6,690,-849 assigned to 30 states from a discretionary fund, and $531,950 from funds apportioned to Alaska, Hawaii and Puerto Rico.

The program as announced covers only smaller airports, those designated by CAA as Class 1, 2 and 3, since the Act requires the CAA to submit to Congress a list of proposed larger airports at least two months in advance of the fiscal year in which they are to receive funds. It was impossible to comply with this requirement for the current fiscal year, since the Act had not become law two months before July 1, 1946. In view of these legislative provisions, it is planned that a proportionately larger part of the funds that will be made available by Congress for use in 1948 will be spent on Class 4 and larger airports to bring the program into balance.

The 1947 program for the entire country calls for construction of 232 new Class 1 airports, the type suitable for pesonal flying; 109 new Class 2 airports, suitable for personal flying and local commercial service; 44 new Class 3 fields, suitable for use of smaller transport planes; and three new seaplane bases. Projects for improvement of certain existing airports call for 82 Class 1 fields, 177 Class 2 and 153 Class 3.

Total airport costs for both Federal Government and sponsors are broken down as follows, according to preliminary estimates: $55,965,448 for the landing area program; $5,087,800 for buildings other than hangars; and $10,538,617 for land.

"Every effort has been exerted by careful engineering and close scrutiny of project requests filed to make Federal money go as far as possible toward creating a truly comprehensive national network of airports," the Administrator said. "We, of course, are aware that many deficiencies exist in large terminal airports for air transportation, and we will assist local governments in remedying these just as soon at the law permits and funds are appropriated."

In the 11 Western states and Alaska and Hawaii, 230 projects are listed, involving a total expenditure of $13,568,-434, divided $7,063,071 from Federal funds and $6,505,363 from local sponsoring sources.

A detailed list of Western projects showing work to be performed and allocation of costs is given herewith.

Loc. & Name of Airport	Class Pres.	Class Prop.	Sponsor	Funds Federal	Total	Proposed Work
Grangeville	3	2	6,794	8,775	15,569	Improve land. strip, constr. add'l. land. strip, access rd.
Jerome	1	2	17,903	19,807	37,710	Land, improve landing strip, constr. add'l. land. strip, apron paving, lighting
Cottonwood	0	1	5,780	4,302	10,082	Land, constr. land. strip
Council Mun.	0	2	9,795	11,932	21,727	Land, constr. land. strip
Whitebird, State Emergency	0	1	5,318	5,432	10,750	Land, constr. land. strip
Priest River Mun.	1	1	1,419	1,832	3,251	Reconstr. land. strip
Shelley Mun.	0	1	2,287	1,338	3,625	Land, grading, draining, bldg.
Downey	0	1	1,440	1,500	2,940	Land, constr. land. strip
Emmett Mun.	1	2	500	645	1,145	Land & extension of land. strips
Aberdeen Mun.	1	1	774	1,000	1,774	Improve land. strips
Kamiah Mun.	2	2	4,994	2,856	7,850	Land, improve land. strip, access road
Payette Mun.	2	2	774	1,000	1,774	Improve land. strip, approach clearance
Parma	1	1	1,190	1,538	2,728	Improve land. & taxiway strips, surf. apron
Wilder	0	1	7,702	4,198	11,900	Land, constr. land. strip
Kooskia Mun.	0	1	3,000	1,000	4,000	Land
Homedale Riverside	0	1	3,654	4,000	7,654	Land, constr. land. strip
Nampa, Ritchey Field	1	2	31,739	30,211	61,950	Land, realignment & ext. of land. strips, rny. & apron paving, lighting, fencing
Caldwell Mun.	2	2	23,396	30,216	53,612	Improve land. strips, pave rnys., taxi. & apron, lighting, utilities, access road
Challis Mun.	1	2	5,676	6,324	12,000	Land, constr. land. strip, fencing, Adm. bldg., util.
Moscow Mun.	0	2	111,008	128,992	240,000	Land, constr. land. strip, lighting, fencing, Adm. bldg., access road, grading, draining, paving of rny., taxiway & apron
Payette Lake Mun.	S-1	2	3,731	3,381	7,112	Land, improve & extend land. strip
Orofino Mun.	1	1	2,749	3,551	6,300	Improve land. strip & pave apron & taxiway
Nez Perce Mun.	0	1	3,267	3,500	6,767	Land, constr. land. strip
Mackay	1	1	2,121	2,379	4,500	Land, improve land. strip, fencing, marking, Adm. bldg., & apron paving
Hazelton	0	1	4,647	5,283	9,930	Land, land. strip & bldg. construction
Wendell Mun.	0	1	20,000	25,829	45,829	Land, constr. land. strips, surf. apron, taxi. & rny., Adm. bldg., access road, utilities
Dubois	2	2	3,243	3,507	6,750	Land, improve land. strips, fencing, Adm. bldg., util.
Kellogg, Shoshone Co.	2	2	4,582	5,918	10,500	Reconstr. of land. strip, taxi. constr. surf. rny., apron & taxiway
New Plymouth	0	1	5,354	6,196	11,550	Land, constr. land. strip
Preston Mun.	1	2	9,946	12,054	22,000	Land, improve land. strip, pave apron & taxiway, fencing, access road
Roberts	0	1	1,586	914	2,500	Land, grading land. strip
MONTANA						
Bozeman, Gallatin Field	3	3	103,075	118,925	222,000	Grading, drainage, fence, taxiway, apron, lighting, Adm. bldg.
Kalispell, Flathead Co.	3	3	23,215	26,785	50,000	Drainage, pave apron, Adm. bldg., roads, utilities
Shelby	0	2	79,074	90,978	170,052	Grading, drainage, land. strips, runway, taxiway, apron, office bldg., lighting
Sunburst	0	1	20,497	21,803	42,300	Grading, drain & turf landing strips, apron, office bldg. fencing, utilities
Ronan	0	1	16,365	9,035	25,400	Land, grading, drainage, fencing
Fairfield Mun.	0	1	721	240	961	Land
Livingston Mun.	3	3	7,429	8,571	16,000	Marking, Adm. bldg., utilities
Plentywood	0	2	20,429	23,571	44,000	Landing strip, marking, apron, office bldg., utilities
Polson	S-1	1	23,908	17,492	41,400	Grading, drainage, land, fencing, apron, utilities
Roundup	2	2	4,340	4,477	8,817	Level land. strips, fencing, apron, utilities
Glendive Mun.	1	2	6,043	6,357	12,400	Land, grading, fencing, utilities
Hamilton	S-1	2	4,268	4,432	8,700	Fencing, roads, clearing, grading
Deer Lodge	0	2	3,255	3,745	7,000	Grading, rock excav., marking, utilities
NEVADA						
Overton Public	0	3	30,666	45,110	75,776	Grading, land
NEW MEXICO						
Gallup Mun.	1	3	149,458	197,072	346,530	Runway, taxiway, apron, fencing
Portales	2	1	20,633	27,207	47,840	4 strips, fencing, marking
Hobbs (Lea City)	3	3	55,428	73,085	128,513	Taxiway, apron, Adm. bldg.
Alamogordo Mun.	0	1	25,580	29,295	54,875	Land, 4 strips, fencing, marking
Clayton Mun.	3	3	68,255	90,000	158,255	3 strips, runway, taxiway, apron, fencing, marking
Clovis Mun.	2	2	39,350	35,630	74,980	Land, 3 strips, fencing, marking
Grants	0	1	37,279	42,504	79,783	Land, 2 strips, fencing, marking
OREGON						
Hood River Co.	1	1	11,500	7,000	18,500	Grade and drain
Wasco	1	1	12,900	15,500	28,400	Grading, marking, surfacing, lighting, Adm. bldg.
Lexington	2	2	5,500	7,000	12,500	Grading, fencing, lighting

(Table continued on page 98)

Tilt-up Building—
New Method of Erection at Vancouver

Vancouver builders demonstrate successful use of "tilt-up" principle for two story buildings—Wall panels poured on floor then lifted to permanent position after curing — Lifting rig used inside building to lift first floor panels — Second floor walls erected from outside

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THE CONSTRUCTION of a new building for Reid's Holiday Togs, Ltd., at 1255 West Pender St., Vancouver, B. C., by Alfred Horie Construction Co., Ltd., demonstrated that the principle of "Tilt-up" panel construction can be applied to a 2-story building as satisfactorily as to a single story edifice.

In May, 1946, a contract was awarded to the construction firm for erection of a 2-story reinforced concrete building 66 x 125 ft. in dimension. Acute shortages of many building materials, particularly lumber, nails and cement, made this appear to be a difficult task. However, during the early design stages the contractor's engineers met with Leslie Willoughby, district manager for the Portland Cement Association, who made a suggestion which eventually resulted in the type of construction which was adopted. He suggested the Tilt-up method and after a thorough investigation of this system of construction it was decided that not only could the ground floor wall panels be so erected, but also those for the second floor.

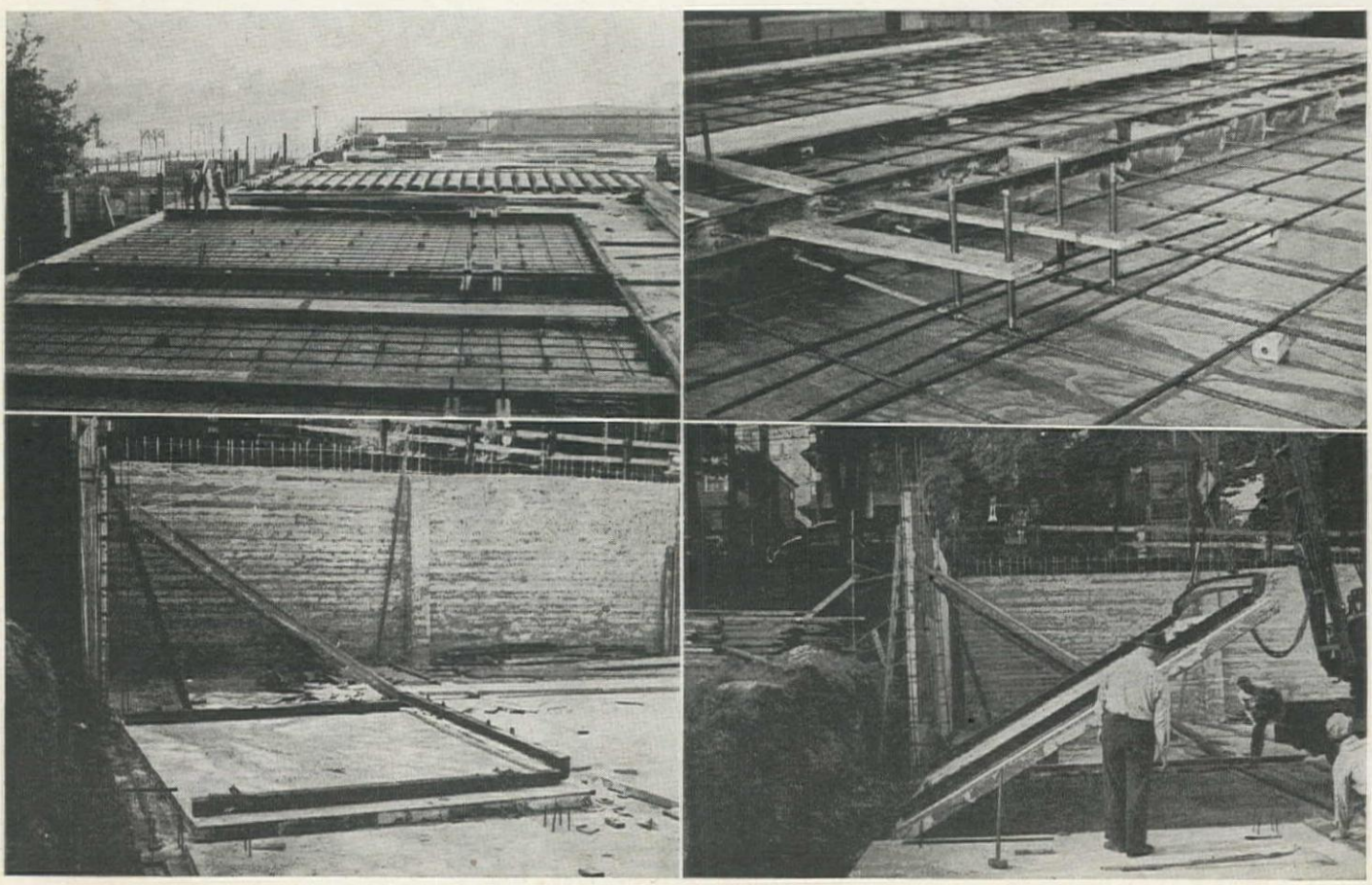
The foundation walls and footings for the building were first constructed by standard methods, next the ground floor slab was poured and the surface floated and trowelled to its final finish.

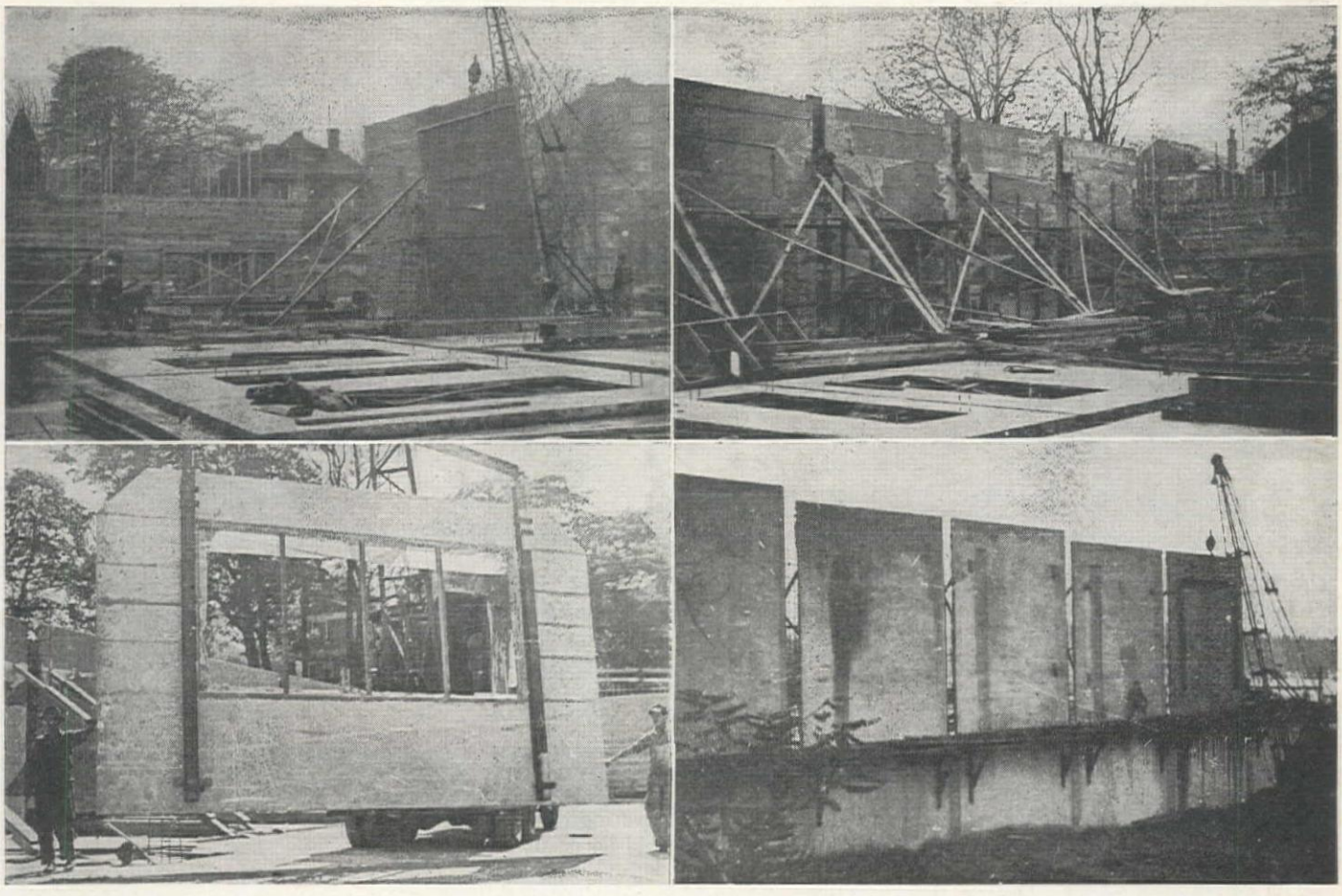
Casting wall panels

The next step was to lay out each of the wall panels on the floor surface immediately adjacent to their final position so that after casting they would need only to be tilted up into the vertical position. This was of course impossible for the corner panels. Waxed kraft paper sheathing, supplied by the Sidney Roofing & Paper Co., Ltd., was spread on the floor to prevent bonding of the two concrete surfaces.

The bulkheads were constructed of 2 x 6-in. lumber and were drilled to receive ½-in. round reinforcing steel, 13 in. on center each way (minimum required by City of Vancouver building laws). Horizontal steel projected 7 in. on each side to furnish bonding to the columns. The bolt templates were next placed, followed by a 2-in. length of No. 3 pipe hanger iron which was used for securing the top of the temporary wall braces. This iron was bent and wired

CASTING WALL PANELS: Panel forms are placed on floor, upper left, adjacent to their final position; Upper right, bolt templates in place, preparatory to pouring concrete; Wall panel with bulkheads loosened, lower left; Ground floor panels were erected from the inside, lower right. Steel lifting rig was attached by bolts previously placed in concrete for that purpose.





RAISING WALL panels for second floor. Rig was placed outside for second story work (upper left). A series of wall panels erected and braced (upper right). Ground floor corner panel, weighing approximately six tons, being picked up and carried to final position (lower left). Outside view of second story panels in place, (lower right). Below: Plumbing first floor panel against column form.

to a bar of reinforcing steel, tucked under the waxed kraft sheathing. Anchor bolts for securing the bottom of the temporary wall bracing system were cast in the floor slab in the area between wall panels.

When all these preparations were completed concrete was placed exactly as in pouring a floor slab, particular care being taken to see that the paper was not creased or pushed out of place, since this would result in an uneven bottom surface. The top surface, which becomes the outside of the building, was finished by floating and trowelling.

Tilting wall panels

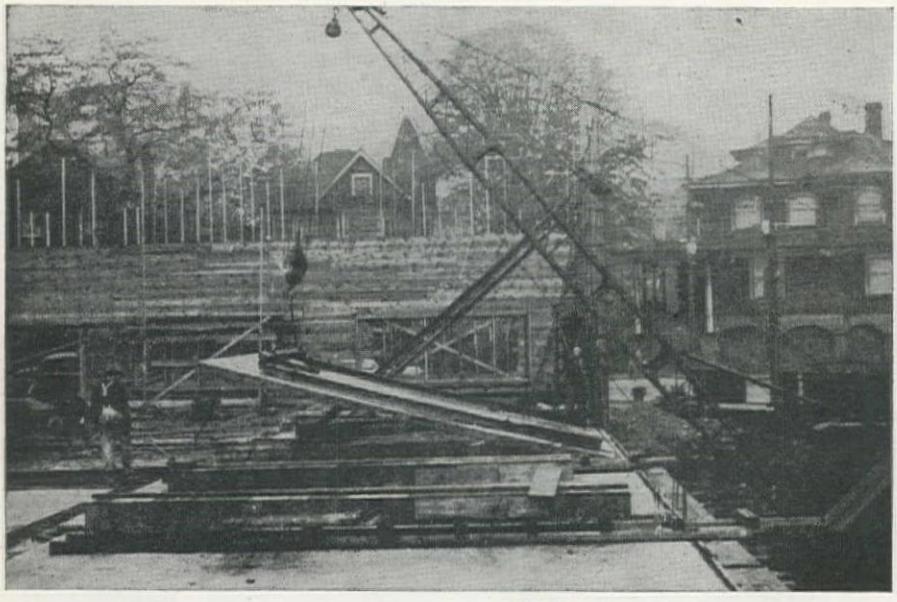
After curing the wall panels seven days for the ground floor (summer weather) and fourteen days for the second floor (autumn weather) erection began. The lifting rig was attached to the panels by the bolts which had been cast in the concrete for this purpose. These bolts were well greased to facilitate removal after the panels were in place as they were later to be used in making up the 10 x 18-in. laminated roof beams.

The lifting rig consisted of two 5-in. steel H-beams, slightly shorter than the height of the panels. These beams were fastened to the panel at two points in the upper half and one point in the lower section of the panel and were wedged tightly against the concrete. A 5-in. H-beam yoke reinforced with two plates of ½ x 5-in. steel was attached to the H-beams by means of a hinged connection so that the yoke could rotate freely as the panels assumed a vertical position when hoisted by a power crane. This member was 3/5 of the panel width. By this arrangement of the beams, the concrete was relieved of any lifting stresses other than that occasioned by its own weight.

On the ground floor the wall panels were erected by a crane located inside. It was found that no bumper was required. On the second floor the panels were erected from the outside since both adjacent properties were vacant and there was no objection to the crane operating there. The largest of these panels, 16 ft., 4 in. x 22 ft. x 0¾ in. x 6 in., contained 6 cu. yd. of concrete and weighed approximately 12 tons. Because of this weight it was found that a winch truck attached to the upper end of the crane boom was required to bolster the lifting capacity of the truck crane.

A set of blocks and tackle was used to prevent the top of the panels from going too far past the vertical and to make the final adjustments in plumbing the panels. As panels were erected they were braced against column forms already in place, and when concrete was poured the units became a monolithic mass.

Corner panels were cast in the center bay of the floor area, this being necessary because they overlapped each other. The ground floor corner panels each 20 ft., 2 in. x 11 ft., 11 in. and weighing approximately 6 tons each were picked up by the crane and carried to their final position. The second floor corner panels each 20 ft., 2 in. x 16 ft., 8 in., and weighing approximately 10 tons each, were first yarded forward, and then raised



A SET of blocks and tackle was used to prevent the top of the panels from going too far past the vertical and to make final adjustments in plumbing the panels. Two extra winches were used on the crane to lift heavy second floor panels.

to the vertical position in the same manner as the other wall panels.

Erection data

A truck crane of 8-ton capacity was supplied by the Merchants Cartage Co., Ltd., to erect the ground floor panels. A period of 17 hrs. was required to erect and brace 16 wall panels. During this operation the weather was warm and dry and the fast time of 25 min. per panel was established for four consecutive panels. Terminal Cartage Co., Ltd., supplied a 12-ton truck crane and winch truck for erection of the 14 second floor side wall panels and the three end wall panels. A time of 13 hr. was required for these end panels since they were erected under extremely adverse conditions with the weather near freezing.

On the basis of the crossed data compiled on this job and for similar jobs on which the walls have been poured in place, it appears that a saving equivalent to the total cost of erecting one face of the forms which would be required for the poured-in-place method.

Other firms which contributed to the erection of the building were: Diethers, Ltd., pre-mixed concrete; Dominion Bridge Co., Ltd., reinforcing and structural steel; Western Bridge & Steel Fabricators, Ltd., lifting rigs and anchor bolts; Fred Mitchell, placing reinforcing steel; Campbell & Grill, Ltd., roofing and sheet metal; Gordon & Belyea, Ltd., building hardware; and George Wilkie, Ltd., plumbing and heating.

Weight of Water at Boulder Dam Causes Over 4,000 Minor Earthquakes

MORE THAN 4,000 man-made earthquakes have been recorded in the last eight years at Lake Mead, the reservoir created by Boulder Dam on the Colorado River, but there is no cause for alarm. All it means is that the earth's surface is adjusting itself to the weight of 40 billion tons of water in the lake.

Only a few of the quakes were sufficiently strong to be felt by human beings, and the total force of all 4,000 is not more than 1 per cent of that exerted by a destructive natural earthquake. All quakes, as recorded by three seismographs placed strategically in the area by The Coast and Geodetic Survey at Reclamation Bureau request, are along natural faults of the geological formation, and none occurred within a mile of the dam itself. Measurement of the earth's settlement under the tremendous load imposed by the world's mightiest dam and reservoir was undertaken as a precaution. Most of the earth movements occurred in the first few years after the dam was completed in 1936. Since 1942 the number has been low.

It is estimated that the lake basin has settled several inches with respect to the neighboring mountains.

Seismographs also have been installed at Shasta and Grand Coulee dams. At Shasta, when the reservoir started to fill in 1944, a swarm of local shocks was felt, but since that year few shocks could be attributed to reservoir loading. At Grand Coulee, where no known faults in the earth's crust are near the dam, the reservoir load is expected to bend the crust downward a small amount rather than rupture it along faults. Therefore few, if any, local earthquakes are expected to occur.

Data collected so far indicate that the Lake Mead earthquakes are associated with definite geological faults, none of which threaten the dam or other important structures. A reservoir in process of filling can cause small quakes under certain conditions. That is, the load must be concentrated over a small area and underlying rock must already be fractured along definite fault lines. Loading alone will not produce earthquakes, for the extra load of the reservoir water is too small to cause new faults. Further, if the area is visited by a severe earthquake, the quake would have occurred regardless of reservoir loading because forces sufficient to produce a shock of this type are so much greater than the load of any reservoir which man can make.

Report on Cody Dam in Wyoming Is Unfavorable

A REPORT unfavorable to construction at this time of the Cody Dam and Power Plant on the Shoshone River in Wyoming, submitted by the Bureau of Reclamation after investigations of the proposal, has been approved by Secretary of the Interior J. A. Krug.

The Cody Dam and power site is downstream from the Buffalo Bill Dam and Reservoir and Shoshone Power Plant and adjacent to the city of Cody, Wyo. Development of the Shoshone irrigation project, including the Heart Mountain and Oregon Basin extensions, will reduce the water flow at the proposed Cody dam site, Reclamation engineers said, to a point where generation of any substantial amount of firm power will not be feasible. Power revenues over a fifty year period would equal less than 54 per cent of the costs of the development.

The investigations were financed in part with funds advanced by the city of Cody and the Wyoming State Highway Commission.

The report is now being transmitted to the State of Wyoming and to the War Department for comments in accordance with the provisions of the Flood Control Act of 1944.

Upon receipt of these comments, the report, together with the comments, will be transmitted to the President and to the Congress.

Bids Open Soon on Portland Sewage Disposal Project

CONSTRUCTION OF THE FIRST unit of the $14,388,000 sewage disposal project of the city of Portland was recommended to the city council by consulting engineers John W. Cunningham and John C. Stevens, and city engineer Ben S. Morrow in a report made recently to the commissioner of public works. In addition to urging that bids be called in the first three months of this year for construction of the Columbia Slough unit of the project, the report raised by several millions the original estimated cost of the project. It was also recommended that bids be called for construction of two pumping plants and for pumping equipment. Plans for the entire project are about 70 per cent complete.

Construction Design Chart

LXXX . . . Balanced Tensile Reinforcing

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THE ACCOMPANYING chart is the second of a related series, all being based on a maximum allowable steel stress of $f_s = 20{,}000$ p.s.i. The first one, for an ultimate strength of concrete of $f'_c = 2{,}000$ p.s.i., appeared in the Aug., 1946 issue.

Since rectangular beams with only tensile reinforcing are to be found in but a few isolated cases, a chart based on balanced tensile reinforcing would seem to have little application. However, the problem of greatest application for such a chart is for negative moments at supports of continuous beams. In the conventional design we usually have a slab which has been poured monolithically with the beams resulting in a T-beam to resist positive bending moments. At the support, where a negative bending moment occurs, the tensile reinforcing is at the top of the beam and the slab cannot be figured as any aid in resisting flexure. Result is a rectangular section usually with compression steel.

When computing a rectangular beam reinforced for compression, such a chart is a very distinct help. It will quickly indicate whether compression steel is necessary, and if so will assist in the computations. A straight line intersecting all scales is necessary for a solution. If the actual bending moment is in excess to that indicated on the chart moment scale for the section assumed, it will be necessary to include compression steel. I would refer those readers who have available a copy of the published book of previous articles in this series to the descriptive material on pages 27 and 29 for a more complete discussion of the problem than space will allow in this issue. Under the method to be discussed, the resisting moment of the section is broken down into two elements:

M_1 = resistance of the section under balanced tensile reinforcing,

M_2 = excess moment which must be cared for by additional tensile reinforcing and compressive reinforcing,

$M = M_1 + M_2$ = total moment the section must resist.

As an illustrative problem, let us assume that a rectangular beam is subjected to a negative moment as follows, in which $f'_c = 2{,}500$ and $f_s = 20{,}000$:

Beam section, $b' = 14$ in.
$d = 20$ in.
Total moment, $M = 130$ ft. kips.

Under conditions of balanced tensile reinforcing, the assumed section could resist a bending moment of

$$M_1 = K\ b\ d^2 = \frac{196 \times 14 \times 20^2}{12 \times 1{,}000} = 91.5 \text{ ft. kips,}$$

$$A_{s1} = p\ b\ d = 0.0113 \times 14 \times 20 = 3.17 \text{ sq. in.}$$

A solution line has been drawn on the accompanying chart for the same conditions, with results which agree with those found above by substitution in the equations.

The additional moment, to be carried by additional tensile steel and compression steel, will then be

$$M_2 = M - M_1 = 130 - 91.5 = 38.5 \text{ ft. kips.}$$

If the center of the compression steel is 2.5 in. from the outside of the beam, the area of additional tensile steel would then be

$$A_{s2} = \frac{M_2}{f_s(d - d')} = \frac{38.5 \times 12{,}000}{20{,}000 \times 17.5}$$

$$= 1.32 \text{ sq. in.}$$

Thus the total area of tensile reinforcing would be

$$A_s = A_{s1} + A_{s2} = 3.17 + 1.32 = 4.49 \text{ sq. in.}$$

The unit stress in the compressive reinforcing is figured on the straight line relation. For balanced reinforcing and the stress limits specified, we would then have

$$kd = 0.403 \times 20 = 8.06 \text{ in.}$$

then $$\frac{f'_s}{20{,}000} = \frac{kd - d'}{d - kd}$$

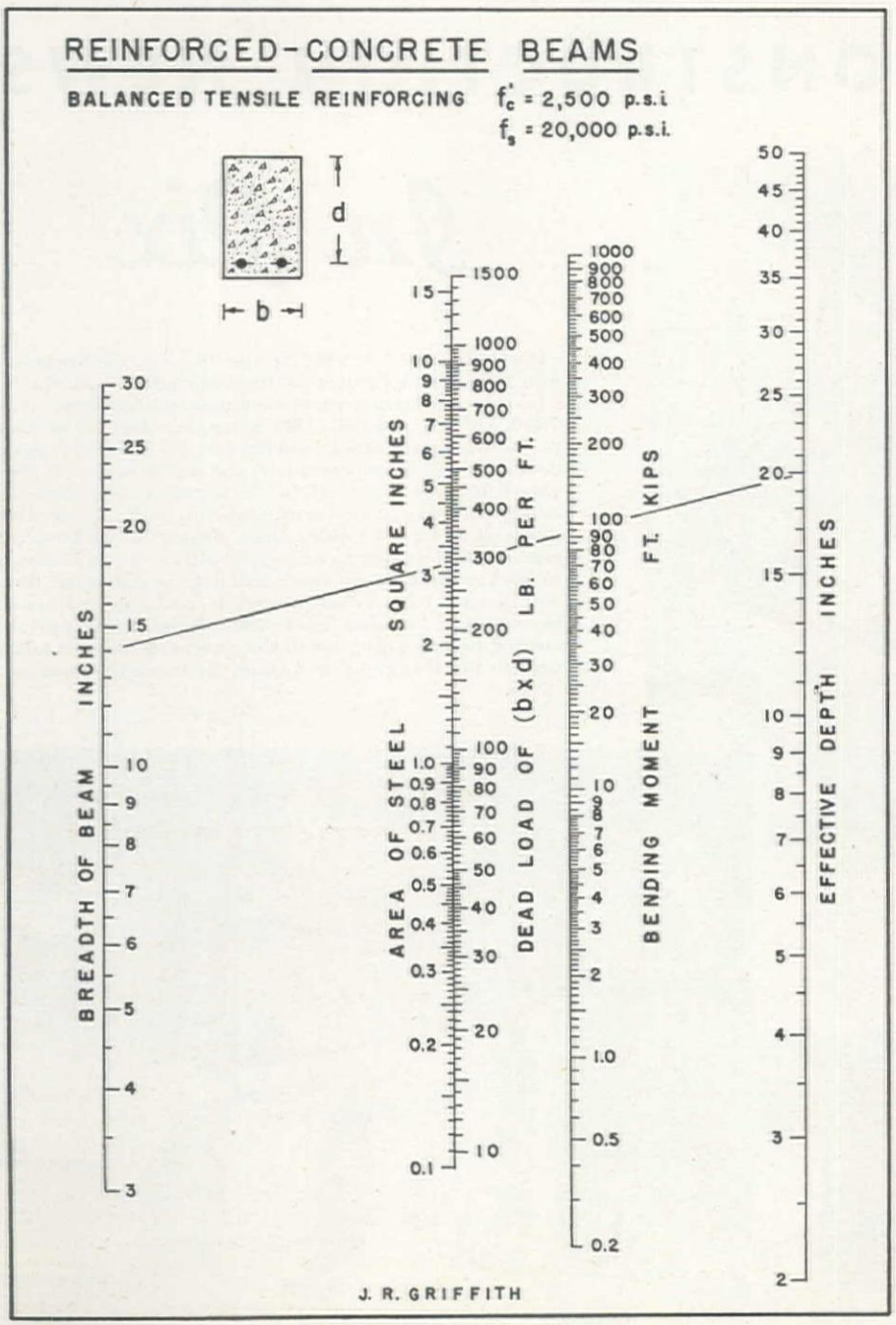
or $$f'_s = 20{,}000 \left(\frac{8.06 - 2.5}{20 - 8.06} \right)$$

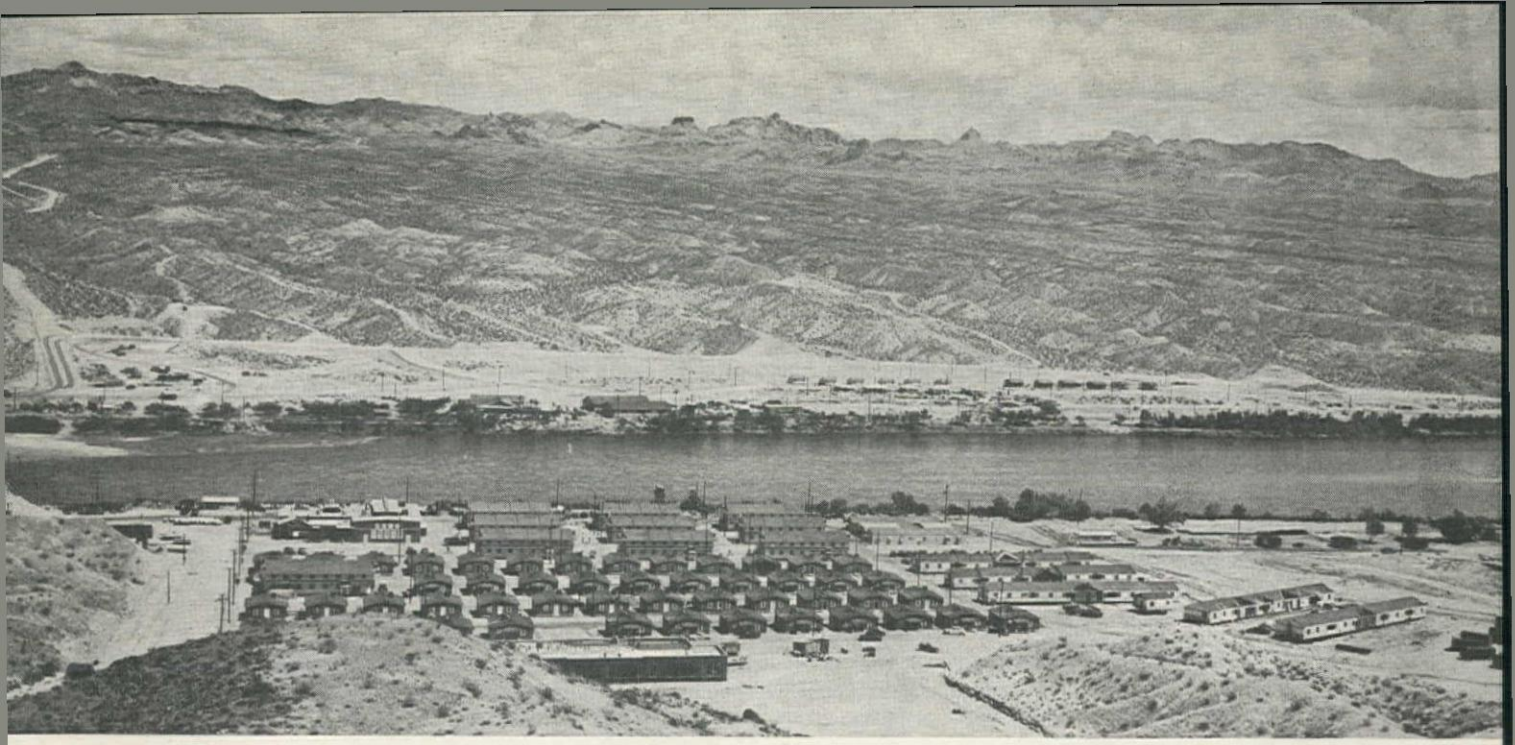
$$= 9{,}300 \text{ p.s.i.}$$

The total necessary area of compression steel would then be

$$A'_s = \frac{M_2}{f'_s\ (d - d')} = \frac{38.5 \times 12{,}000}{9{,}300 \times 17.5}$$

$$= 2.45 \text{ sq. in.}$$

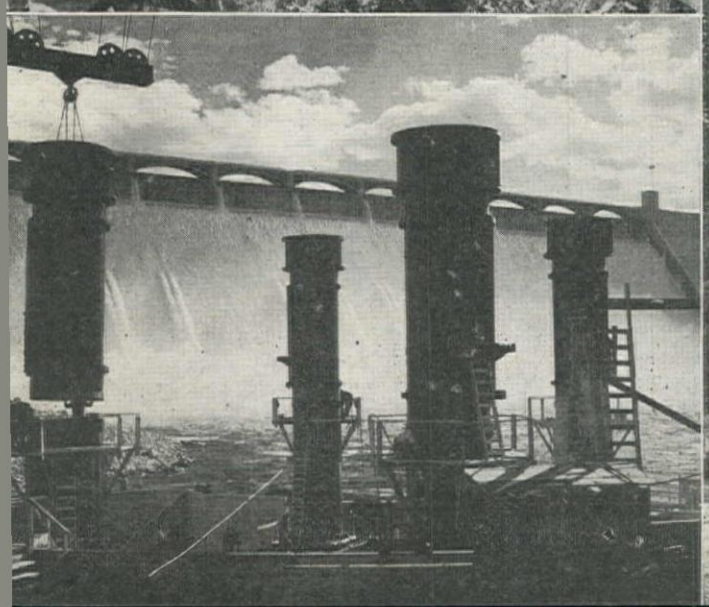




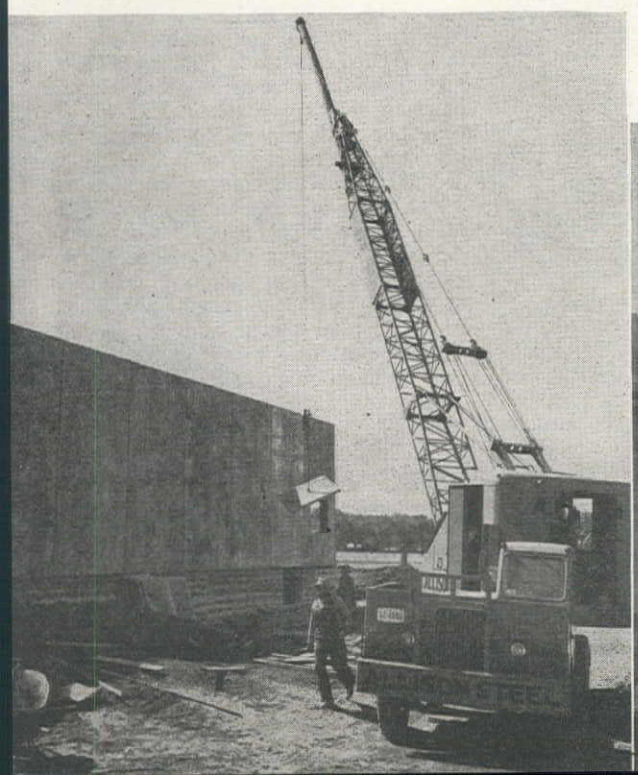
WESTERN CONSTRUCTION NEWS

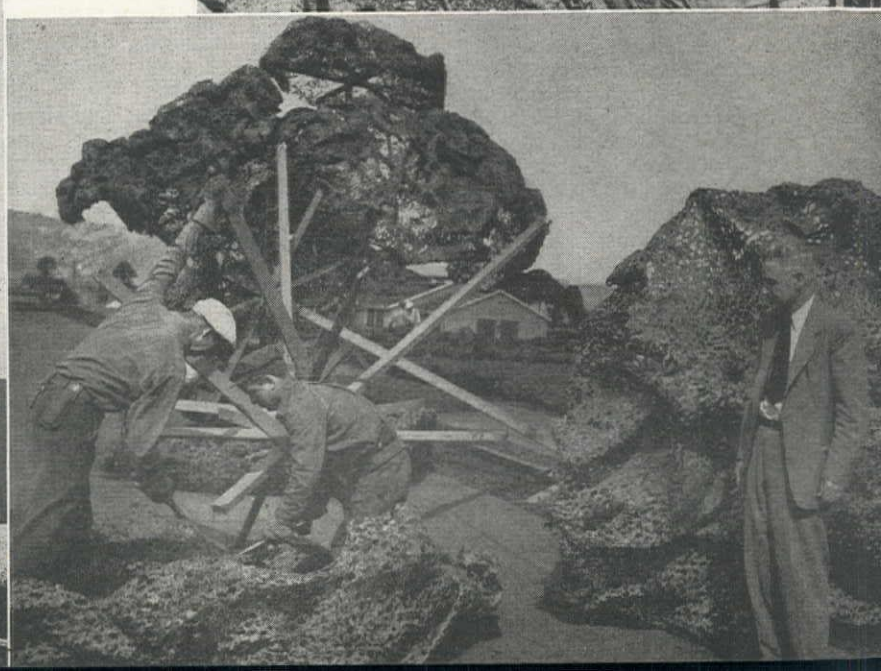
In Pix

CONTRACTOR'S CAMP at the Bureau of Reclamation Davis Dam Project on the Colorado River, above. Ultimate population for the community is estimated at 1500. Left, a Caterpillar D8 tractor clearing a 22-ac. plot to develop home sites in San Francisco's Lakeshore park development. When complete, the subdivision will provide 1,500 new homes. Below left, steel access tubes are being fitted to a huge floating caisson, built in a circular drydock at Grand Coulee Dam, Wash., so underwater repairs can be made to damaged spillway bucket, shown in background. Seven and a half feet in diameter, they will be used to carry air, materials, and service lines to the working chamber below water. Below right, prefabricated houses going up in the government town adjacent to the Hungry Horse Dam site in north Montana.



OLD SPANISH MILL, early water power plant and familiar landmark at Ruidoso, New Mexico. Above left: On a sagebrush-covered bench above the Columbia River, about 14 mi. northwest of Pasco, Wash., a dragline of J. A. Terteling & Sons, Inc., Boise, Ida., excavates a channel for the 9.4-mi. Main Lateral of the 5,397-ac. Pasco unit of the million-acre Columbia Basin Irrigation Project. This canal, which will probably be carrying water by 1947-48, will be 5 ft. wide at the bottom, 23 ft. at the top. It will receive Columbia River water from a large steel pipe which will carry nearly 500 gal. per sec. up the riverbank from a pumping plant being built by the James Construction Co. of Seattle. The $714,223 Terteling contract calls for construction of approximately 23 mi. of lateral and wasteways involving an estimated 114,000 cu. yd. of excavation, 163,000 sq. yd. of canal lining, and 30,000 ft. of concrete pipe. Right: forty thousand hectares of virtual desert will be turned into fertile farmland in Mexico's Valsequillo Valley, south of Mexico City, upon completion of a new irrigation project. The project includes an earth dam 85 meters high, canals, a tunnel 11 kilometers long through the hills, and a siphon to carry water over a gorge. Approximately 400,000,000 cubic meters of water will be stored. Shown here is excavation for main canal. Below right: GLENN A. BARCROFT, right, project engineer for Seattle Engineer District on the job of removing camouflage from Boeing Plant No. 2, inspects contractor operations as employees of L. B. Colton Co., Los Angeles, wield pliers and tin snips on dummy trees of chicken wire garnished with chicken feathers. Below left: Erection of pre-cast concrete panels on a building by the Allison Steel Co., Phoenix, Ariz.





FWA Approves Planning Fund Appropriations for the West

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.

Alaska

Ketchikan was advanced $7,500 for planning construction of new streets and improvement of existing streets, including crushed rock surfacing and sidewalks, estimated to cost $374,300; and the University of Alaska received $26,300 to prepare plans for new buildings at College, and for agricultural experiment stations to be located at Fairbanks, Matanuska and Petersburg, at an estimated total cost of $795,000.

Arizona

Arizona State Hospital at Phoenix was allotted four advances: $2,850 for a laundry building estimated to cost $77,250; $7,850 for a male ward building estimated to cost $209,085; $7,850 for a female ward building estimated to cost $209,085; and $3,050 for a nurses' dormitory estimated to cost $87,620; and Benson received $4,300 to plan a sanitary sewer system and treatment plant, to cost $97,600.

Arizona State School for the Deaf and Blind was advanced $9,600 to assist in planning new buildings at Tucson, estimated to cost $278,500; Arizona State Hospital received $10,200 to plan a new admission building at Phoenix, estimated at $270,300; Phoenix received a grant of $69,000 for planning water system additions and a booster station, which will probably cost $1,607,500; and Winslow High School District was loaned $9,000 to design additions to their plant, estimated to cost $254,000.

California

California projects allocated planning money appear below, listed in the following order: Recipient—planning funds—project—estimated cost.

Alturas, four advances totaling $7,100 for sewerage and water systems, $129,620; Campbell Union School District of Santa Clara County, two advances totaling $14,500 for elementary schools, $325,000; Fresno City High School District, seven advances totaling $95,950, high school additions, $57,900, $1,153,000; Fresno City School District of Fresno County, four advances totaling $38,050, three new elementary schools and additions to existing buildings of another, $732,000; Jefferson Union School District of Santa Clara County, three advances totaling $9,900, for elementary school additions at Santa Clara, $185,000; Benicia, $18,000, sewer system additions including treatment plant, $346,500; King City, two advances totaling $2,700 for sanitary sewer system additions and street grading and paving, including drainage structures, $99,900; Lawndale School District of Los Angeles County, $5,500, elementary school, $144,000; Merced Union High School District, two advances, $4,400 and $6,800, high school industrial arts building at Livingston, $120,000, and high school industrial arts building at Merced, $163,200; Mill Valley School District of Marin County, $6,800, elementary school at Strawberry Point, $125,848; San Bernardino, $2,900, sanitary sewer system additions, $156,220; San Diego County, $90,450, new Hall of Justice at San Diego, $3,671,000; San Jose Unified School District, $70,800, high school, $1,375,000; South San Francisco, $12,900, sewer system additions, $286,700; Tamalpais Union High School District, four advances totaling $22,750, for high school buildings at Mill Valley, $412,000.

Planning advances have also been made for the following projects: Alameda, 11 advances, totaling $69,700, units of new storm drain system, total cost $1,950,030; Armona, $4,800, sanitary sewer system, $110,800; Atascadero, $3,000, elementary school, $89,900; Calistoga, $11,650, additions to water system, including treatment plant and reservoir, $212,000; Centerville, $4,250, sewage treatment plant, $165,500; Coachella School District, $4,400, elementary school additions, $130,000; Colfax, $3,300, sewage plant improvements, $65,000; Dinuba, 3 advances totaling $18,350, elementary schools, total cost $344,980.

Fullerton, $15,750, junior college building, $342,500, also $11,440, high school building, $249,700, also $5,500, music building, $120,479; Goleta, $4,900, sewer system additions, $108,743; Homestead Valley Sanitary District, $3,900, sanitary sewer trunk at Mill Valley, $72,800; Kentfield, $4,650, school additions, $85,000; Lower Lake, $3,300, high school additions, $59,400; Red Bluff School District, $4,500, elementary school, $104,000; Redondo Beach, 7 advances totaling $45,250, various new school buildings, $1,139,000; San Bernardino School District, 5 advances aggregating $21,050, additions to 5 schools, $490,812; San Bernardino High School District, 3 advances totaling $21,800, additions and remodeling at 3 schools, $487,128.

San Francisco, $18,200, recreational facilities, $363,500, also $6,450, playground development, $270,500; San Pablo, $32,000, sewage treatment plant, $679,000; Santa Monica, $15,900, underground water storage reservoir, $341,850; Santa Rosa, $24,500, earthfill dam and water supply mains, $1,369,972; Shasta County, $3,350, sanitary sewer system at Anderson, $60,000; South San Francisco, $15,000, sewage treatment plant, $302,500; Strathmore, 3 advances, total of $10,800, school buildings, $199,170; Watsonville School District, $6,100, elementary school, $115,598; Watsonville High School District, $38,000, three school building projects, $708,145.

Berkeley School District received two advances: $15,800 to prepare plans for the Jefferson School, to cost $322,200, and $16,850 to plan the Washington School, which will cost $342,540; Bloomington School District received an advance of $3,800, to design elementary school additions, which will cost $97,500; Grass Valley was granted $18,000 to plan sanitary sewer system additions, estimated at $330,500; Lemon Grove School District was given $1,850 to design elementary school additions, to cost $41,082; Portola Sanitary District received $9,600 to design a sewage collection system and treatment plant, estimated to cost $175,000; Quincy Sanitary District received $4,300 to design a sewage collection system and plant, to cost $175,500; Redding was allowed $900 to design a sanitary sewer system, to cost $43,500; Ramona Sanitation District received a grant of $6,900 for designing sewer facilities, expected to cost $150,460; Salinas School District was advanced $19,200 to plan a new elementary school, which will cost $355,000; Santa Barbara was given two advances: $6,900 to design street work, estimated to cost $304,060, and $5,000 to lay out park developments, which will probably cost $117,500; and Santa Cruz County was allotted $42,000 for designing a new courthouse at Santa Cruz, estimated to cost $818,500.

Colorado

Minturn was advanced $3,100 to plan a sanitary sewer system and disposal plant, estimated to cost $45,000; and the joint high school district of Morgan and Weld counties received $7,100 to design a high school at Wiggins, to cost $184,000.

Hawaii

Kalapana, Puna, was granted a loan not to exceed $101,250, which will be used to defray the Federal Government's share of restoration of park facilities, estimated to cost $202,500; Hilo was granted $20,000 to meet half the cost of replacing 11,000 ft. of water mains and 64 water meters, estimated to cost $40,000; Hilo was also granted $7,500 to meet half the cost of inspection and repairs to sewer connections and outfall, together with repairs to sewage pumping stations at Hilo, estimated to cost $15,000; Hawaii County was allotted $35,000 for a new county building at Hilo, estimated to cost $750,000.

Hawaii County got two further advances: $25,000 to design an auditorium at Hilo, estimated cost $570,000, and $3,500 to plan garage and storage facilities for the county motor pool at Hilo, estimated to cost $78,500.

Idaho

St. Anthony was advanced $1,400 for a sewage treatment plant estimated to cost $49,300; and Preston was granted a $2,850 loan for planning sewerage system extensions, estimated to cost $76,245.

Montana

Boulder received an advance of $4,000 for preparing plans and specifications for

a water system, including supply wells, reservoir and distribution system, estimated to cost $92,200.

Nebraska

Axtell was advanced $2,400 to design a sanitary sewage collection system, to cost $65,955; Cotesville received $900 to plan a complete waterworks system, estimated at $25,303; Gothenburg was granted $2,850 to lay out a sewage treatment plant, to cost $78,100; Holdredge was allotted $1,450 to plan remodeling of an auditorium, cost estimated at $50,000; and Scotia received two advances: $700 to plan water system expansion which will cost $18,433, and $2,150 to design a sewage collection system, probably costing $59,761.

Phelps County School District was granted $3,450 to plan remodeling of present school facilities, estimated to cost $125,000.

Nevada

The State of Nevada has received two advances: $5,000 for laying out a new heating plant at Reno, estimated to cost $108,000, and $27,000 for designing additions and alterations to the State Capitol at Carson City, estimated at $627,000; and the Regents of the University of Nevada were given $20,000 to assist in planning a new agricultural administration building at Reno, to cost $414,000.

Elko County was advanced $30,000 to design a general hospital at Elko, estimated to cost $652,000; and Hawthorne received $1,250 for planning elementary school additions which will cost $24,360.

New Mexico

Artesia was awarded $8,000 to plan street improvements estimated to cost $248,942; Bayard received an allotment of $1,600 to assist in designing water supply improvements which will probably cost $50,000; Las Cruces was advanced $12,000 to plan street improvements to cost $318,000; and Mountainair received $7,000 for laying out street improvements which are estimated at $187,500, also $3,250 to design a sanitary sewer system to cost $126,900.

North Dakota

New England was advanced $1,700 for planning water and sewer extensions, estimated at $61,766; and Scranton received $1,100 to design a sewer system, which will probably cost $40,184.

Oregon

Multnomah County School District was granted $2,500 to plan additions to a grade school, estimated to cost $58,800.

Haskell County was advanced $4,200 to finance plan preparation of a hospital addition estimated to cost $125,000; Menard County received $600 for designing an airport access road to cost $13,033; Howe was given $1,750 for planning a sanitary sewer system which will cost $44,974; and Pleasanton was allotted $3,300 to plan a sewer system and disposal plant, estimated cost $81,830.

South Dakota

Lemmon was given a Federal advance of $6,800 to plan street paving and grading, estimated to cost $149,011.

Texas

Bells was allotted $1,750 to plan a sanitary sewer system and disposal plant, estimated to cost $42,176; Taylor received five advances: $1,550 for additions to the Twelfth Street School, to cost $45,229; $4,450, additions to the Blackshear School, cost $128,183; $1,550, a 4-room elementary school, cost $44,896; $1,850, athletic field and concrete stadium, cost $50,380; and $500, vocational shop addition to high school, cost $13,870.

Collinsville was advanced $2,150 for planning a sanitary sewer system, including treatment plant, also additional well water supply, estimated cost, $55,058; Richardson was granted three loans: $750 for a new city hall, estimated to cost $19,978; $2,800 for additional well water supply and extension to water and sewer systems, estimated to cost $71,698; and $1,250 for a sewage treatment plant, estimated to cost $29,707. West Texas State Teachers College at Canyon was allotted three advances: $13,150 for a girls' dormitory estimated to cost $412,000; $14,200 for a library estimated to cost $469,050; and $1,650 for a college president's residence and social center, estimated to cost $39,207.

Ellis County School District was granted $6,400 to plan remodeling of present school facilities, estimated cost $170,000.

Utah

Blanding was advanced $1,100 to prepare plans for a water reservoir and transmission line, estimated to cost $31,200; Coalville received $3,000 to design a sanitary sewer system, which will cost $91,000; Heber City was granted $4,000 for planning sanitary sewer extensions, estimated at $212,700; Manti was given an advance of $4,200 to lay out a sanitary system, including treatment plant, costing $120,000; Mt. Pleasant was awarded $6,000 to plan Unit 1 of a sanitary sewer system, to cost $150,000; Nephi received $1,050 for water supply system plans, the project to cost $30,000; Roosevelt was given $650 for designing a culinary water reservoir, estimated to cost $17,490; Salt Lake City was advanced $40,000 for planning a sewage treatment plant estimated to cost $2,772,000, and also $20,000 to design a refuse incinerator, to cost $667,125; Salt Lake County received an advance of $9,100 to plan a sewage treatment plant costing $254,900; and the joint boards of education of Duchesne and Uintah counties were allotted $11,000 to plan a high school near Roosevelt, which will probably cost $466,000.

Ephraim received $6,800 to plan Unit 1 of a new sanitary sewer system, which will probably cost $170,000; Gunnison received $3,800 for designing a sanitary sewer system, estimated at $107,000; and Pleasant Grove received $6,000, also to design a sanitary sewer system, including treatment plant, estimated to cost $150,000.

The government advanced to South Ogden a loan of $17,500 for designing street grading and paving, estimated to cost $590,000; West Jordan was allotted $4,750 to prepare specifications on a sanitary sewer system, which will cost $125,000; and the State of Utah received three advances: $3,500 for an isolation ward near Provo, to cost $109,650, $3,400 for a nurses' home near Provo, estimated at $99,870, and $9,100 for a center for adult blind at Salt Lake City, estimated to cost $256,800.

Washington

Adams County has been granted $15,000 to prepare plans for a senior high school at Lind, including auditorium, gymnasium and cafeteria, estimated to cost $629,532; Bellingham was allotted two advances: $5,250 for plans and specifications of a storm water sewerage system, estimated to cost $311,540; and $7,500 for a sewage treatment plant, estimated to cost $351,800. Clarkston was granted $5,000 for an estimated $95,750 sewage treatment plant; Fircrest was advanced $2,200 for a water storage tank, improvement to wells, replacement of mains and other water system betterments, estimated to cost $63,300; Island County has been granted an $8,500 loan for a new courthouse at Coupeville, estimated to cost $230,000; and Stevenson was allotted $1,750 for planning a new reservoir and replacement of the main water supply line, estimated to cost $50,000.

Des Moines Sewer District was awarded $8,500 to prepare plans for a complete sanitary sewerage system, estimated to cost $192,435; King County School District received $39,400 to assist in planning the first unit of a high school near Seattle, to cost $816,500; Kittitas County was advanced $26,000 for planning a new courthouse at Ellensburg, estimated at $626,800; Okanogan was allotted $5,550 to design a sanitary sewerage system, costing $161,320; Port Angeles School District got $13,200 for planning the first unit of a high school, estimated to cost $308,290; and Sequim School District received $15,000 to finance plans for a grade school to cost $420,000.

Wyoming

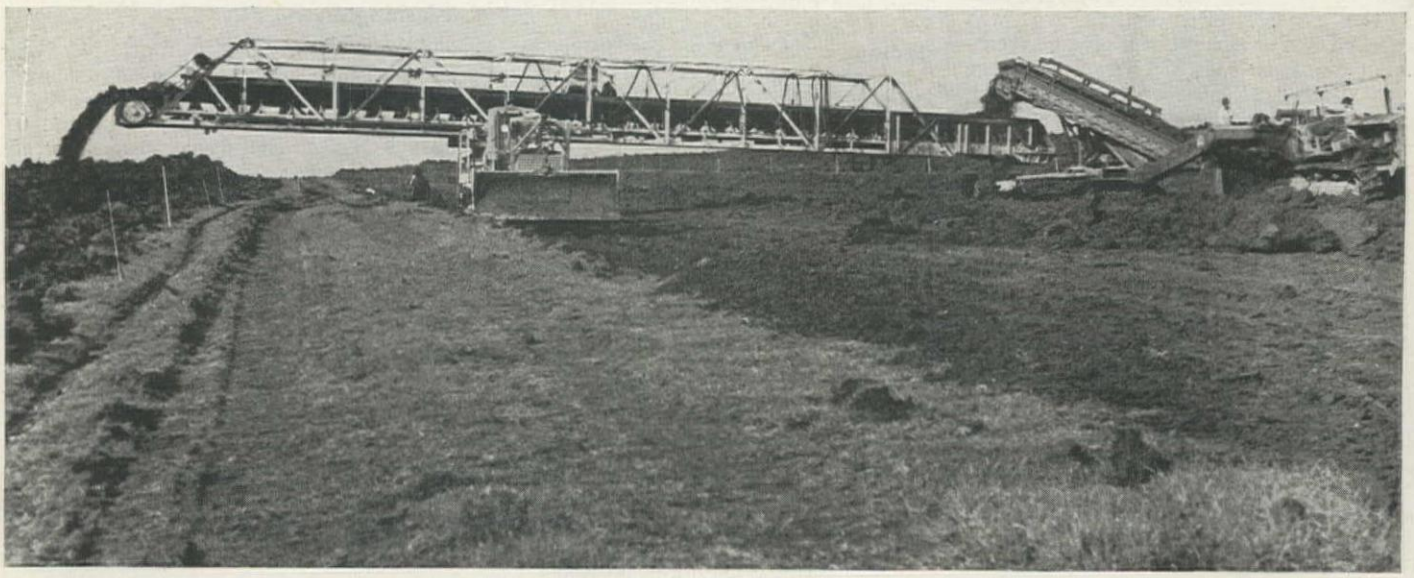
Crook County High School was advanced $2,700 to plan a new building at Sundance, estimated to cost $71,400; Laramie received a grant of $2,000 to lay out trunk sewer lines, to cost $54,960, and also $10,000 to plan a sewage treatment plant, which will cost $220,500; and Lincoln County School District was allotted $10,000 to design a gymnasium-auditorium at Kemmerer which will probably cost $265,000.

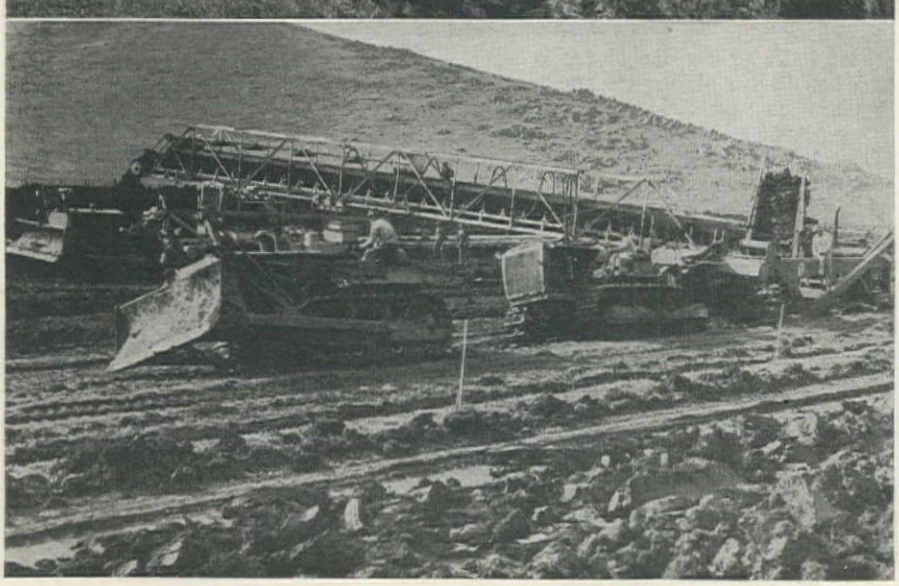
Complete Utah Mining Town Declared to Be War Surplus

A COMPLETE Utah mining town was offered for sale recently by the War Assets Administration. The community, 25 miles east of Price, center of Utah's coal producing region, is known as Dragertown. The August, 1943, issue of *Western Construction News* carried an article on the construction of the town, built during the war to house mineworkers.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD





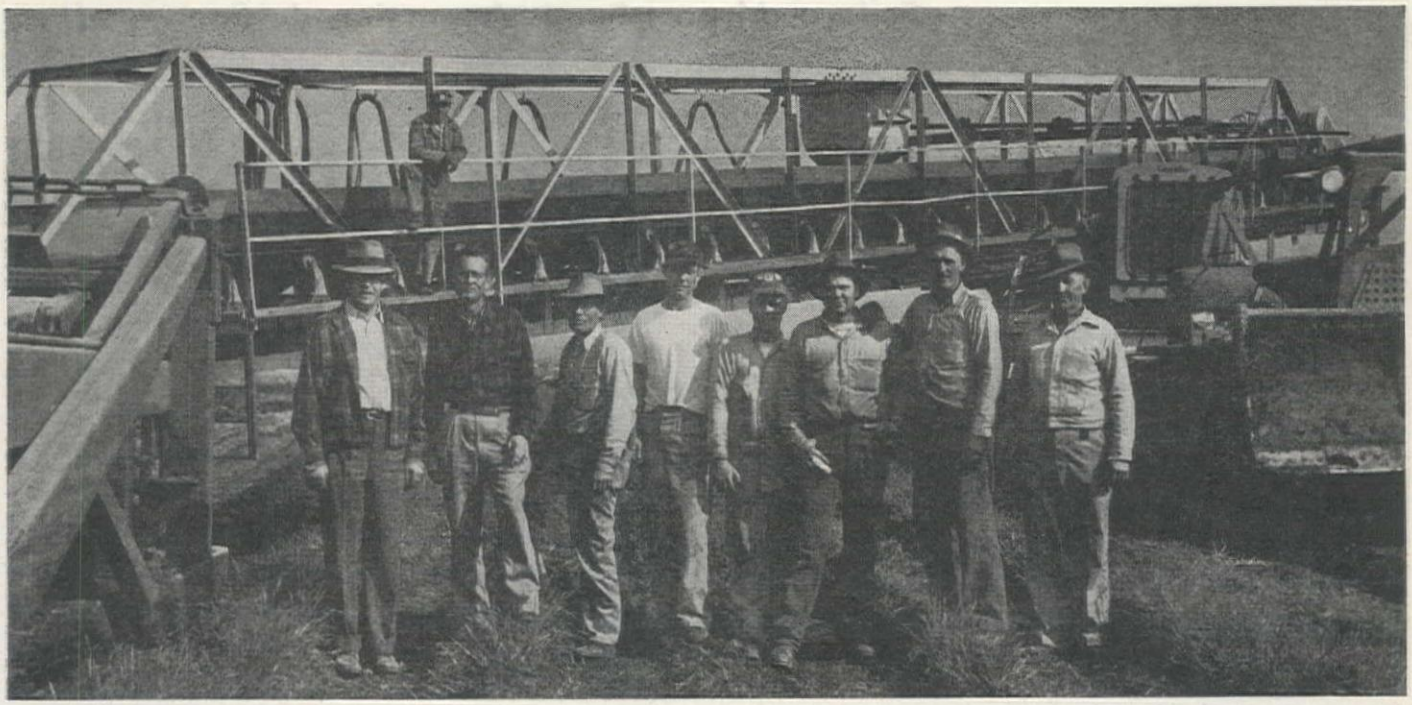
New Conveyor-Stacker Speeds Canal Digging

A HUGE STACKER capable of handling 1,500 cu. yd. of dirt per hour has been designed and built by Guntert & Zimmerman in their shops on Banner Island near Stockton, Calif., for use on the Friant-Kern Canal, one of the main units of the Bureau of Reclamation's Central Valley Project of California.

The first such unit was delivered in December, 1946, by rail to the Arizona-Nevada Constructors, Inc., who have a $5,000,000 contract for nearly 40 mi. of the main canal along the east side of the San Joaquin Valley south of Friant Dam. Approximately 2,000,000 cu. yd. of excavation are included in the Arizona-Nevada contract. A portion of the canal will be unlined, 60 ft. in bottom width and 18 ft. deep. The remainder of the canal will be lined with concrete, 36-ft. bottom width and also 18 ft. deep.

The stacker is essentially a portable conveyor belt mounted on a steel truss. The belt will convey the material 100 ft. on a 60-in. conveyor belt powered by an electric motor, the current for which is furnished by a Diesel electric generator set on the front support unit of the con-

THE CONVEYOR-STACKER in action on the Arizona-Nevada Constructors, Inc. contract for a section of the Friant-Kern Canal. Top, overall view of the machine stacking dirt 100 ft. away from the point of digging; Center, discharge end of the stacker when operating at about 1000 cu. yd. per hr., belt speed of 600 ft. per min. throwing dirt well away from the machine; bottom, motive power furnished by three crawler tractors.



OPERATING CREW for the Guntert & Zimmerman stacker on the Friant-Kern contract, l. to r.: L. G. LYNCH, project manager for Arizona-Nevada Constructors, Inc.; DON HUGHES, grading superintendent; JESSE SIMMONS, foreman; PERRY EDWARDS, loader operator; RALPH PUGH, tractor operator; J. E. CRISWELL, field mechanic; PERRY PRATT, lead tractor operator; "POP" FOSTER, general superintendent. On the stacker is A. A. MEEK. A crew of only four men is required for operation.

veyor. Forward motion of the stacker is furnished by three D-8 tractors.

As operated on the Friant-Kern contract, the material is dug by a Euclid loader which digs an 18 x 28-in. ditch as it is towed forward by a crawler tractor. The loader is fastened to the receiving end of the stacker by a steel tie arm. In front of the loader are two tractors. The nearest is hitched directly to the loader. When first put into operation the lead tractor was fastened to the front of the second tractor, thus making the latter a moving drawbar, but this was not found to be entirely satisfactory, so a tow cable from the lead tractor now passes completely under the body of the second machine and ties to the neck of the loader.

The third tractor is tied to the middle support of the stacker. This support is topped by a swivel joint, thus automatically adjusting the vertical position of the discharge end of the conveyor belt to the vertical position of the Euclid loader. As the loader digs deeper and deeper into the trench the discharge rises higher, as does the berm it is building.

The speed of the conveyor belt is 600 ft. per min., allowing an ultimate capacity of 1,500 cu. yd. of dirt per hr. in ideal digging material. In the first section of the canal on which the machine was operated, the material was heavy clay and top soil and with a crew just becoming acquainted with operation of the unit only about 1,000 cu. yd. per hr. were moved. However, this rate of operation has been increasing steadily. The operation can be carried on with a crew of but four men, consisting of three tractor operators and a belt man, and no other equipment except the three tractors and loader.

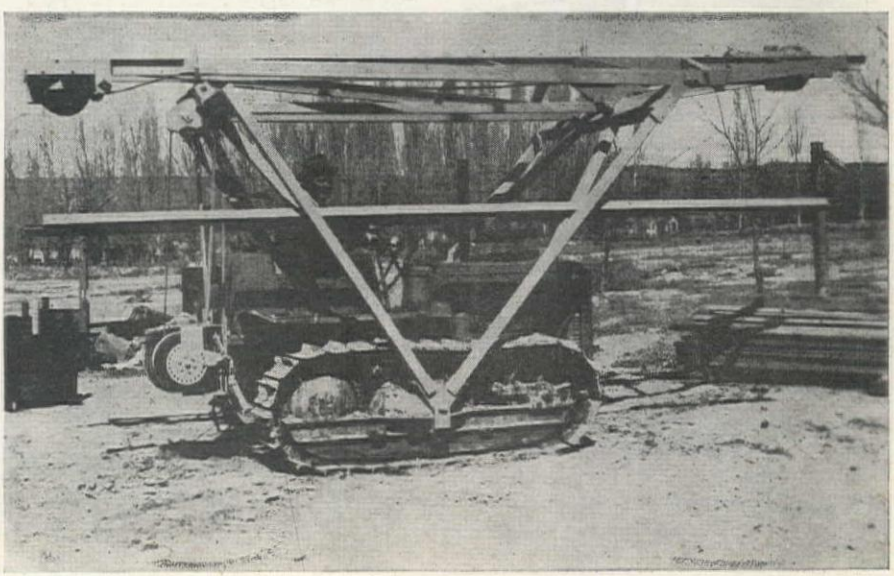
Carl A. Powell, consulting mechanical engineer of Stockton, assisted the Guntert-Zimmerman forces in the design of the 100-ft. conveyor-stacker. L. G. Lynch is project manager for the contractors.

The Friant-Kern Canal is the main canal from Friant Dam to the southern portion of the San Joaquin Valley. It originates at the dam and extends ultimately to the vicinity of Bakersfield. The present contract begins at the discharge end of the Kings River siphon and carries to the Kaweah River, a short distance south of Woodlake. The ultimate length of the canal is approximately 165 miles, but only the first 70 miles have yet been placed under contract. The construction is being performed by the Bureau of Reclamation.

Tractor Rigged as a Pile Driver

A CRAWLER TYPE tractor was converted into a pile driver by Ector G. Cave and Clarence Jensen of Price, Utah, as shown in the photographs on this and the next page. The machine is of course portable, either under its own power if the distance between points of operation is short, or on a trailer bed if there is a considerable move between jobs. It is easily collapsible, the driving leads laying back over the tractor, when it is desired to move, but when the leads are put in their vertical position, they are firmly held so that the hammer can deliver a sound, full stroke.

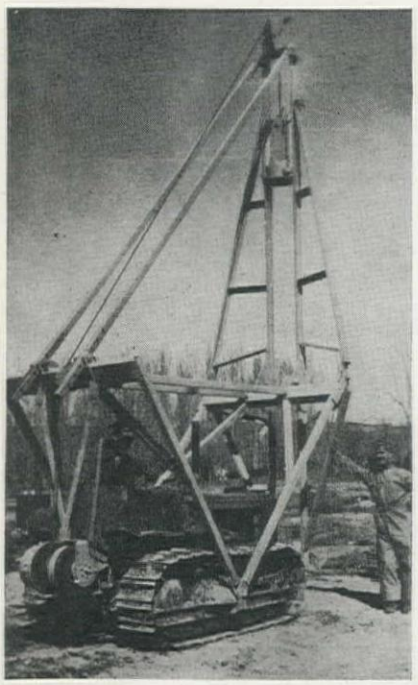
The pile driver attachment was built



by the two construction men of boxed 2½ x 2½-in. angle iron, 8-in. channel iron, and ¾-in. steel plate. By using this type of members, they consider that they have materially cut down on weight, without sacrificing any strength. All members were welded, with the exception of the hammer and driving cap. They use a 750-lb. hammer on the machine, and power is furnished through cables from the power control unit of the tractor.

The hammer guides are 20 ft. long, and are spaced 14 in. apart. This permits driving of piling having a maximum diameter of about 12 in. They have found that they can drive a 12-in. pile, 15 ft. long, in 25 min.

The device can be used for driving piles on a batter, as well as vertically, for the angle iron braces from the rear end of the tractor to the top of the hammer leads are drilled for seven different settings, thus permitting the leads to be tipped to six different positons beside the vertical. Incidentally, when collapsed for moving, the long braces are laid horizontally in the angles of the main frame, one on each side of the operator's seat, as seen in the photo on the preceding page.



UNQUESTIONABLY many regular readers of this magazine make daily use of time and labor saving devices which they themselves have invented. Other engineers and construction men in the West would be similarly helped if they knew how these "gadgets" worked. The "How It Was Done" section is always open to the presentation of pictures and description of such inventions, and the editors will be happy to receive the information from readers at any time.

Federal Airport Funds Apportioned (Continued)

(Continued from page 87)

Loc. & Name of Airport	Class Pres.	Class Prop.	Sponsor	Funds Federal	Total	Proposed Work
Joseph Mun.	1	2	800	300	1,100	Seed
Myssa Airpark	1	1	3,700	4,700	8,400	Grading and surfacing
Hillsboro Mun.	3	3	6,400	8,100	14,500	Utilities
Enterprise	1	1	4,400	5,600	10,000	Rock excav. and lighting
Prairie City	0	1	3,700	3,500	7,200	Clearing, drainage, fencing, lighting, roads, utilities
Florence	0	1	6,600	8,400	15,000	Clearing, grubbing, grading and turfing
John Day	1	1	3,000	1,000	4,000	Land
Burns Mun.	3	3	8,600	8,900	17,500	Paving, building, utilities
Bend Mun.	2	2	18,900	24,100	43,000	Landing strip, taxiways, fencing, access road
Baker Mun.	3	3	57,174	72,826	130,000	Taxiway, Adm. bldg., paving
La Grande Mun.	3	3	12,300	15,700	28,000	Well, taxiway, fencing, paving apron
Ontario Mun.	3	3	7,000	8,900	15,900	Taxiway, rock excav.
Coquille	0	1	20,800	16,000	36,800	Grading, draining, fencing, marking, access road
Albany	2	2	11,100	3,700	14,800	Land
Prineville, Crook Co.	2	2	500	700	1,200	Rock excav.
The Dalles Mun.	0	SPB	15,000	19,000	34,000	Seaplane mooring base, dock, dredging, piling, etc.
UTAH						
Price, Carbon Co.	2	3	69,215	112,805	182,020	Grading, paving, lighting, land
Nephi Mun.	2	2	32,750	53,430	86,180	Grading, paving, lighting
Vernal Mun.	1	3	74,730	120,060	194,790	Land, grading, paving, lighting
Spanish Fork-Springville	2	2	31,440	47,720	79,160	Land, grading, paving, lighting
Tremonton Mun.	1	2	24,670	35,570	60,240	Land, grading, paving, lighting
Kanab Mun.	0	3	23,980	29,790	53,770	Land, grading, apron paving, access road
Salina-Gunnison	0	2	18,410	24,200	42,610	Land, grading, apron paving
Green River Mun.	0	2	29,560	42,010	71,570	Land, grading, paving
Monument Valley	1	2	12,825	20,045	32,870	Land, grading, apron paving, access road
Panguitch	0	2	16,710	23,380	40,090	Grading, drainage, apron paving, access road
Beaver Mun.	3	2	41,100	67,510	108,610	Grading, clearing, draining, apron paving
St. George Mun.	2	2	11,190	18,250	29,440	Grading, clearing, draining, apron paving
Moab	2	2	13,530	22,090	35,620	Grading, draining, apron paving, access road
Myton	1	1	12,300	20,190	32,490	Grading, draining, fencing, access road
Roosevelt Mun.	3	2	35,630	51,900	87,530	Grading, draining, fencing, apron paving
Duchesne Mun.	3	2	24,200	35,980	60,180	Grading, draining, apron paving
Torrey	0	2	12,350	20,160	32,510	Grading, draining, apron paving, access road
WASHINGTON						
Kelso	2	3	62,500	39,500	102,000	Land, clear & grade for runway; drainage facilities
Lester	0	1	57,800	61,800	119,600	Land, land. strip
Willapa Harbor	0	2	43,900	47,300	91,200	Grading, pave runway, taxiway & apron, drainage, Adm. bldg., lighting
Port Townsend, County-City	0	3	78,900	82,200	161,100	Clear, grade, drain, fence, pave, Adm. bldg.
Chelan	2	2	27,100	29,100	56,200	Runway, access road, limited taxiway
Concrete	0	1	15,200	15,800	31,000	Land, clearing, grubbing, grading, fencing & marking, access road, utilities
Colfax, Whitman Co. Memorial	0	1	20,000	21,600	41,600	Grade land. strip, fence, mark, access road, utilities
Oroville, Dorothy Scott Mun.	3	3	9,600	10,400	20,000	Regrade present land. strip
Kirkland	0	1	34,600	30,700	65,300	Clearing, grading, draining, Adm. bldg.
Clarkston, Asotin Co.	2	2	35,400	36,500	71,900	Grading, paving rnys. & taxiway, lighting, Adm. bldg.
Wenatchee, Pangborn Field	3	3	28,900	31,100	60,000	Grade, drain & pave apron, landscape
Blaine Central	1	1	11,300	9,300	20,600	Land, clear, excavate & drain for extension to exist. land. strip, new cross-strip, Adm. bldg., utilities
Bandera	0	1	50,900	54,800	105,700	Land, land. strip
Long Beach	0	1	21,700	23,300	45,000	Grading, drainage, Adm. bldg.
Prosser	3	3	7,700	8,300	16,000	Clearing, regrading, drainage, graveling of rny. & taxiways, lighting
WYOMING						
Rawlins Mun.	2	3	66,044	84,356	150,400	Land, Adm. bldg., landing area
Greybull Mun.	2	3	38,915	52,585	91,500	Landing area
Mondell Mun.	1	1	30,111	40,689	70,800	Adm. bldg., landing area
ALASKA						
Seward	1	2	10,000	30,000	40,000	Grading, drainage
Dillingham	0	2	13,300	40,000	53,300	New airport. Clearing, grading, drainage and runway
Seldovia	0	1	17,300	48,700	66,000	Landing strip, grade, drain, surf., marking
HAWAII						
Hana	0	3	128,250	128,250	256,500	Grading, paving, fencing
Kailua	0	3	100,000	96,000	196,000	Grading, paving, fencing
Kalaupapa	1	2	50,000	50,000	100,000	Grading, paving, fencing
Lanai City	3	3	50,000	50,000	100,000	Paving, fencing
Lihue	0	3	149,000	89,000	238,000	Grading, paving, fencing

NEWS OF WESTERN CONSTRUCTION

FEBRUARY, 1947

Professional Engineer Group Urges Change in Wagner Act

FOLLOWING a prolonged period of study of the Wagner Act and its effect upon the professional engineers of the United States, the National Society of Professional Engineers has determined that corrective action through legislation should be adopted by the 80th Congress, it has been announced by the Society.

Other engineering societies have reached the same conclusion and a concerted effort will be made to have the Congress favorably consider amendments to the present law which are necessary to protect the professional engineer against the abuses that have appeared in recent years.

Since the adoption of the Wagner Act it has become increasingly clear, according to a statement from the society, that the rights of professional engineers, as well as those of other professional employees, have been considered in the same manner as that of the non-professional employee. In many cases the professional employee has been required to become a union member as a condition of employment, even though as a professional employee his interests, standards of work, and ethics of his profession would best be served through association among fellow professionals, rather than through unionization.

The Wagner Act did not recognize, as did the Fair Labor Standards Act, that professional employees have particular problems, aspirations, and relations with management, which are apart and distinct from those of other employees. Consequently, professional employees have been denied their traditional freedom of association and mutuality of action.

NSPE will urge passage of legislation by Congress to insure certain basic rights to professional employees. Among these rights are:

(1) Full freedom of association or non-association, according to the desires of the individual;

(2) The right in association of determining with which agency to be associated;

(3) The right to restrict such agency exclusively to professional employees where desired by the professional employees;

(4) Freedom to associate and confer with management upon mutual interests and problems without being considered a labor organization, where the professional employees desire that course of action.

It is emphasized that the legislation which NSPE urges will not take away from any professional employee his right to join any labor organization, to retain his present membership in a labor organization, or to associate with any newly formed labor organization composed of professional employees. However, it will insure to him the equal right of not joining an organization or of joining only that organization which, to him, best represents his profession and his interests.

SOUTHERN CALIFORNIA AGC ELECTS OFFICERS AT ANNUAL MEET

NEW OFFICERS of the Southern California Chapter of Associated General Contractors pictured at the annual meeting are, l. to r.: J. S. REYNOLDS, board member; ED GREEN, board member; STANLEY BALL, board member; HARRY JAMES, board member; W. D. SHAW, AGC manager; THOS. H. PAUL, vice president; WM. M. JEFFERS of Union Pacific Railroad, guest speaker; J. A. McNEIL, board member; M. F. KEMPER, new president; DONALD MacISAAC, retiring president; CARL ERICKSON, Mountain Pacific Chapter; WM. CURLETT, board member; and HARRY KIRK, Washington office.

Washington Bore Declared Feasible

A 2.03-MI. TUNNEL through the Cascade Mountains near Snoqualmie Pass in Washington has been approved as feasible by Ole Singstad, consulting engineer of New York, and driving of the vehicular tunnel has been recommended by Gov. Mon C. Wallgren in a report to the state legislature. The plan suggested for driving what would be the longest vehicular tunnel in the world calls for construction of a 2-lane tunnel as the first step, and later driving a second tunnel to provide a 4-lane highway under the mountain pass when traffic requires the additional capacity.

Snoqualmie Pass is traversed by U. S.

Highway 10 at an elevation of 3,004 ft. It is the lowest of four vehicular routes across the Cascade Mountains in Washington, and the main year-round route between Seattle and Spokane. Despite its relatively low elevation, the pass is snow-covered five to six months of the year, and in addition to being an expensive section of highway to maintain, it is one of the most dangerous sections of the principal highway routes in the state.

The estimated cost of driving the tunnel has been set at $22,000,000 in the Singstad report. To finance the project the governor has recommended that use of the tunnel be made subject to toll charges which would be used to repay revenue bonds sold to provide the original construction costs. Indications are that the legislature may authorize more detailed engineering surveys looking to the possibility of future construction.

Griggs Opens New CAA Office in Philippines

CHANDLER GRIGGS, airways engineer of the Civil Aeronautics Administration, is opening the CAA's first office in the Philippine Islands early in 1947.

Assigned to assist the Philippine government in establishing airways aids under the Philippine Rehabilitation Act, Griggs will represent all functions of the CAA there until the opening and staffing of the proposed foreign office, scheduled for sometime this year.

His principal assignment is the installation of aids for U. S. trans-oceanic airlines. Tentative plans call for construction of a high-powered communications station in the Philippines similar to the six trans-oceanic stations operated in the U. S.; for traffic control and communications facilities at Manila and three other places yet to be selected; and for two low frequency high power omnidirectional ranges for ocean flying.

The CAA originally surveyed the Islands for airway aids and recommended approximately $32,000,000 for installation and operation of such aids for local and international use. This was reduced to $8,000,000 and no local air routes can be installed and equipped. The $8,000,000 appropriated is available through the fiscal year 1950.

Ask Removal of Escalator Clauses From Subcontracts

THE REMOVAL of escalator clauses from subcontracts or material purchase contracts was recommended to members of the Associated General Contractors of America recently in a resolution passed by the Board of Directors of the Southern California Chapter.

With the removal of government regulations pertaining to material and labor costs, the resolution stated bids containing escalator clauses are no longer necessary, since vendors and subcontractors can now adjust their proposals in consideration of the current and anticipated costs.

Colorado Boomtown's Highway Lack Stirs Legislative Investigation

DEMANDS BY indignant citizens for better roads for Rangely, boom-town oil community, have stirred Colorado legislators into long-delayed action. A strongly worded protest over proposed road allocations of $455,000, which citizens condemned as "unjust, unfair and inadequate," instigated a visit from a committee of two state senators and three representatives, preparatory to a report before the legislature.

Spurred to action by threat of a possible boycott of all Colorado commerce and industry by the wealthy oil center, investigators were provided with further headaches by competition among nearby towns for access roads to the oil community.

Located in the sparsely populated mountainous northwestern section of the state, Rangely's oil company and drilling operator payrolls alone total over half a million dollars a month. Utah, with three hard roads within 35 mi. of the little oil capital, will be the recipient of most of Rangely's business, unless Colorado legislators provide adequate highways for the mud-beleaguered community.

Rifle and Meeker, Colorado towns east of Rangely, have talked hard for an oil-top road from Meeker west on Highway 64, the same artery demanded by Rangelyites. Citizens of Grand Junction, to the south, want a much better highway 139 due north to the oil fields. Both Rifle and Grand Junction claim to be the natural rail head funnels on a transcontinental rail line to the oil boom town. Improvements on both roads would take more than a year to obtain adequate effectiveness.

Another problem was furnished by the proposed cutoff north to highway 40, Rangely's nearest link to a modern highway. If this link is furnished before good routes are supplied east or south, the community payroll would be aimed at Utah.

How much road construction is to be done, and how it will be paid for, is up to the legislature.

Contract Granted for Montana Aerial Maps

AERIAL TOPOGRAPHIC maps of 7,830 sq. mi. of the Montana section of the Upper Missouri River Basin will be made for the Bureau of Reclamation under a contract amounting to $431,460.

The work to be performed under the contract consists primarily of taking the aerial photographs, establishing all field controls, and preparing the topographic maps of the area specified. The maps will be used first in making preliminary investigations of the area, and later in more detailed studies of the dam sites, reservoir areas and canal alignments. Aerial data reduce the amount of work to be done by ground crews, and thereby effect a considerable saving in time and costs.

The contract will be awarded to the Fairchild Aerial Surveys, Inc., Los Angeles, California. It provides that all work shall be accomplished on a standard acceptable to the U. S. Geological Survey, which will field-inspect, edit and publish the maps in accordance with the National Mapping Program.

Great Falls Proposes City-Wide Paving Plan

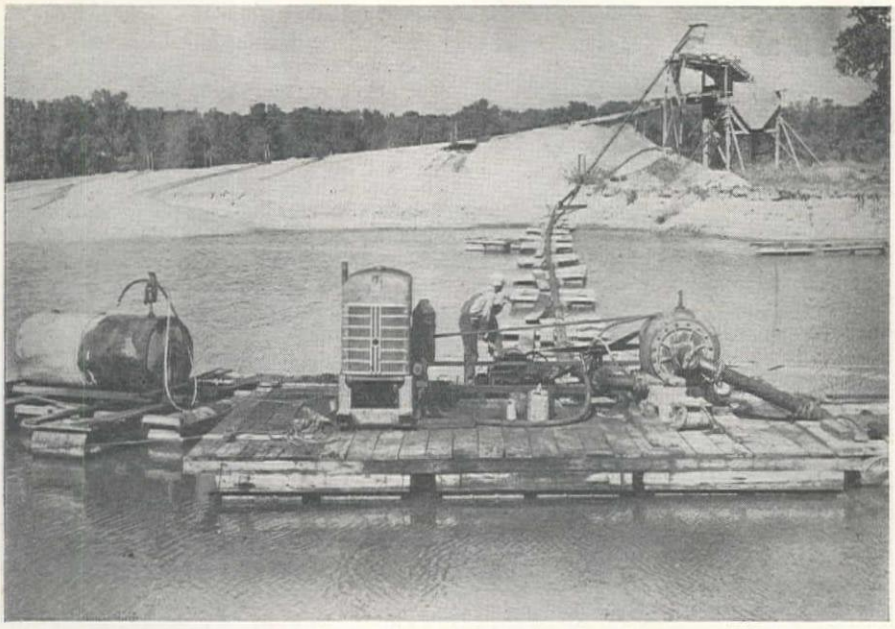
A CITY-WIDE PAVING PROGRAM estimated to cost $6,000,000 is being considered by the city of Great Falls, Mont. Application has been made to the Federal Works Agency for planning aid grants totaling $270,000 to cover engineering and architectural planning for the paving program, a proposed $567,000 storm drain, a $50,000 ice arena, a $50,000 addition to the airport administration building, and replacement of water mains estimated to cost $60,000. Total estimated costs for all improvements are estimated at $6,727,000 of which the paving and storm drains would be the principal projects.

The paving program would be financed by the establishment of special assessment districts. One of the major improvements is the replacement of creosoted wood block paving in the business district of the city. The storm drains, water mains, and ice arena would be financed by municipal bonds. Plans for the storm drains are largely completed in accordance with recommendations made by Black & Veatch, consulting engineers of Kansas City, Mo. Plans for all projects will be prepared under the direction of Ed Henen, city engineer for Great Falls.

Morrison-Knudsen Submits Low Bid on Clark's Hill Dam

MORRISON-KNUDSEN CO., INC., Boise, has submitted the low bid of $24,670,216 to the U. S. Engineer Department at Augusta, Ga., for construction of the main dam of the Clark's Hill project in the Savannah River valley of South Carolina and Georgia. Thirty-eight proposals for construction of the dam were submitted to the engineers. No announcement of award has been made.

Morrison-Knudsen was also announced as the low bidder for general tank construction at the Hanford Engineer Works at Richland, Wash. Bids were taken from a selected list of contractors and no details of the project were announced, either as to the size or type of job. Operation of the engineer works is under the direction of the General Electric Co.



DIESEL-OPERATED MUDHOG SUPPLIES NEBRASKA CONCRETE AGGREGATES

ONLY SOURCE of sand and gravel for concrete making or other purposes in Nebraska is in the beds of the Platte River and other streams which have cut through the several hundred feet of loess soil. Here, near Fremont, Nebr., the Paul Christensen Sand & Gravel Co., raises sand, gravel and water from a 60-ft. deep pit and forces it 180 ft. through a pipe line to hopper and stockpile using a 6-in. centrifugal pump, powered with a six-cylinder Diesel engine which originally powered a truck.

Masonry Output Is Greatest in Years

PRODUCTION of brick and tile exceeded 6 billion brick equivalents during 1946, an increase of 100 per cent over the preceding year, the Structural Clay Products Institute announced in January. The year's output was the greatest since 1939, and shortages had virtually disappeared by the end of the year.

"Production in 1947 will be adequate to meet all demands. In fact, manufacturers may have to curtail their output early in the year to prevent a serious oversupply unless restrictions on non-housing construction are raised considerably within a short time," the report stated.

"The new modular sizes of both brick and structural tile will appear on the market in quantity during the new year and will contribute importantly to lower building costs. It is estimated that savings up to 20 per cent eventually will be effected in the cost of masonry construction when modular bricks and tile are used. The economies will occur principally in on-site construction where there will be savings of both labor and materials.

"Brick and tile have been used to an unprecedented extent in home building during 1946, and the demand for residential construction is expected to increase further in 1947, if the rate of home building lives up to expectations. About half of all new permanent-type homes erected in 1946 are believed to have been built of masonry construction.

"Local shortages of skilled masons are being met successfully, as fast as they materialize, with the aid of apprentice training programs, and the clay products industry is prepared to help promote and expand the training on a broad scale as the need develops. During 1946, 6,796 new apprentices went into training in 238 communities."

Bacon Tunnel Driving In Underground Stage

DRIVING OF THE 10,000-ft. Bacon tunnel for the main canal of the Columbia Basin project's irrigation works reached the underground stage about the middle of December when crews of T. E. Connolly Co. of San Francisco started the 12 by 14-ft. pioneer drift in from the south portal. The first 500 ft. of the pioneer bore is expected to be entirely in sandstone which will begin to taper off at this point and disappear at about 2,800 ft. Remainder of the tunnel will traverse a basalt formation.

Work has now been started at the north portal, including construction of a camp for 200 men. The concrete mixing plant for lining the tunnel will be constructed at the north portal camp. Driving at the north portal will get underground in the pioneer bore as soon as the portal face has been cleared. At the south portal a 3-shift schedule is in effect.

Navy Schedules Examination For Civil Engineers in May

A NEW EXAMINATION will be held in May for civil engineers seeking appointment as junior grade lieutenants in the Navy Civil Engineer Corps. The new examination was scheduled after the Bureau received indications that many applicants had failed to get adequate notice for the test to be given in February. A total of 70 billets are open.

Candidates must be between 22 and 30 years old, must be graduates of an accredited engineering college or university, must have had three years professional experience in engineering, or related active military service, and must be citizens of the United States. Those who will have completed the three years experience or service by July 1, 1947, may be accepted.

The examination, which will be designed to test general engineering knowledge, will require two days. Applicants can get full details from the Naval Officer Procurement office in their area.

NEW BOOKS...

USE OF SLUDGE AS FERTILIZER—prepared under the direction of the Committee on Sewage Works Practice, Federation of Sewage Works Associations, by the Sub-committee on Sludge Utilization for Fertilizer. Published by the Twin City Printing Co., Champaign, Ill., 120 pages, 6½ x 10. Price to members 75¢, to non-members $1.25.

The problem of plant nutrition is as complex as any scientific or practical problem. In maintaining fertility of soil many methods are open, with a wide choice of plant foods. In the complicated combination of agricultural, farm and economic problems, sewage sludge appears as a fertilizer material. Digested sludge is near the bottom of the list. Undigested activated sludge ranks higher. A correct appraisal can only be reached through consideration of all the factors involved. In this manual, material is drawn from a variety of sources. A full list of references is given. Among those best situated to give seasoned advice are the technical experts in the various colleges of agriculture or agricultural experiment stations. Acknowledgment is made to the various sources which have been quoted and in particular to the Report on the Utilization of Sewage Sludge as Fertilizer made by the Committee on Sewage Disposal of the American Public Health Association in 1937, which has been liberally drawn upon for the compilation of this manual.

* * *

MODERN ORGANIC FINISHES, by R. H. Wampler. Published by the Chemical Publishing Co., Inc., 243 King St., Brooklyn 31, N. Y. 445 pages, 8½x5½. Price $10.00.

This book is primarily one of methods. Descriptions of modern finishing materials and equipment for their application, drying and conveying, are presented so that the reader may have an over-all picture of modern industrial finishing operations. Emphasis is placed on proper selection and use of materials and equipment to get the best possible finish at minimum cost.

The author's aim is to acquaint the manufacturer with materials and equipment now available, and to describe good practices and typical procedures for finishing certain articles.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—The Capital during mid-January has been crowded with "missions," the majority apparently being persons who wish to be assured the appropriations in which their region or group is interested will not be unduly pared. A large number of these "missions" represent irrigation and reclamation and public power interests, and probably the most numerous have been those who came from Colorado and adjacent States. These interesting people naturally are not lobbyists; they are people who come here to exercise their constitutional right of petition and appeal to Congress. It is doubtful, however, late in January, whether any of these "missions" will be very sucessful at this time. The whole stew of affairs connected with appropriations is so muddled and balled-up that it is very doubtful if even the best informed members of Congress know what will eventually happen. One thing is quite certain, the real answer will not be apparent until the middle of the year, probably not until June, or even July.

Twenty martyrs

The cause lies in the reorganization program as well as in the switch from one party to another. The new system brings from the President a budget which has been before the Congress—theoretically dominated by the opposite party—since the first days of January. This hapless budget naturally is the target for all the critical observations the opponents may wish to unleash. The other budget, a new institution, is an over-all estimate for the over-all conduct of Government to be filed by Congress itself not later than Feb. 15. The program provided this budget should be prepared jointly by the Senate and House Committees on Appropriations and the Senate Finance Committee and the House Ways and Means Committee, a total of 100 persons, or roughly one-fifth of the membership of the entire Congress. Obviously, to expect a group of 100 persons to prepare anything like a well-considered budget was something like throwing the subject into a town meeting. The joint committees therefore chose 20 of their number to do the job; and these 20—God help them—will submit the report or budget which is to be announced Feb. 15. If you are at all familiar with politics you will quickly perceive this solution gives the minority —Democrats—a grand opportunity to needle the majority by constantly crying gag rule.

The 20 martyrs of Congress by the terms of the new law must determine four general questions: (1) how much is to be spent during the fiscal year between June 30, 1947, and July 1, 1948; (2) how the gross amount determined as the over-all "ceiling" is to be divided between the various agencies of the Federal Government; (3) how much the amount of the estimated tax revenues will be during the next fiscal year; (4) whether any surplus remaining from past appropriations unused, or from any other source, shall be applied to the national debt, or to tax reduction, or to both.

Hearings have been going on in the House Committee on Appropriations on the needs of the different agencies for two main reasons: to throw a sop to the "missions," and to give the Congress a rough idea of how much each agency can be forced to cut its demands. This situation has caused most agencies to do what Mike Straus has done; regional and other field officials have been called from all parts of the continent to figure out how to use to best advantage present funds, and how best to support the demands for next year's budget.

Reclamation fund hopes

It is understood the Reclamation folk decided to shoot most of their funds into the Kortes and Boysen Dams in Wyoming, and into Davis Dam on the Arizona-Nevada border. The idea seems to be that Congress will cut future operations on these projects to ribbons.

The following figures, from the Presidential budget, are given not because they mean anything now, but because they provide some indication of what the Reclamation people have in mind: General investigations, $5,000,000; construction on Pine River, Colo., $175,000; Boise-Payette, Ida., $897,000; Boise-Anderson Ranch, Ida., $4,136,000; Palisades, Ida., $2,629,000; Deschutes, Ore., $1,526,000; Klamath, Ore., $2,000,000; Ogden River, Utah, $30,000; Provo River, Utah, $1,430,000; Shoshone, Power Division, Wyo., $443,000. Operation and maintenance, Parker Dam, Calif., $740,000; Yuma, $170,400; Central Valley, $860,000; Colorado - Big Thompson, $134,000; Boise, $190,000; Minidoka, Idaho, $276,800; North Platte, $142,000; Deschutes, $51,000; Owyhee, $265,000; Klamath, $209,000; Columbia Basin, $1,346,000; Yakima, $234,000; Kendrick, Wyo., $206,000; Riverton, Wyo., $134,000; Shoshone, Wyo., $99,300. For the general fund, Gila, Arizona, $2,500,000; Davis Dam, $18,000,000; Central Valley, $20,000,000; Kings River, Calif., $100,000; Colorado-Big Thompson, $14,000,000; Hungry Horse, Mont., $4,500,000; Columbia Basin, $27,000,000. For general account, Ft. Peck, Mont., $2,500,000; Colorado River Front Work and Levee System, $1,519,000; Colorado River Development, $500,000; Boulder Canyon, $2,357,000; All-American Canal, $4,000,000; Missouri River Basin, $23,000,000; this makes an over-all total of $145,702,200.

Under the new law some funds hitherto available until expended are void. The Reclamation people say this will seriously handicap their long-range programs. The Bureau's current, 1947, program, which ends on June 30, aimed at an expenditure of $157,670,000; if this is actually carried out there would remain unspent $51,700,000, which might be voided under the new law. If the Bureau can secure the use of the unexpended balances its 1948 program would provide a construction program upon which would be expended $184,161,000.

Other hoped-for funds

The U. S. Geological Survey wants $3,750,000, which is $1,251,328 more than it spent or is spending during the current fiscal year on stream gaging. It also asks for $8,500,000 for topographic mapping, most of which is to be spent in the great river basins of the West.

The Corps of Engineers asks for $154,584,000 for general flood control. If they are permitted to use their unexpended balances they would have $215,000,000 for the fiscal year of 1948. Projects in the West include, Holbrook, Ariz.; Big Dry Creek, Kings River, Tulare Lake, Los Angeles River, Lytle and Cajon Creeks, Prado Dam, Santa Fe Dam, and San Gabriel River, Calif.; Cherry Creek, Colorado Springs, and John Martin Reservoir, Colo.; Heise-Roberts Area, Ida.; Cottage Grove, Detroit Reservoir, Dorena Reservoir, Fern Ridge Reservoir, Lookout Point Reservoir, Willamette River, Ore.; Mill Creek, Mud Mountain Dam, Tacoma, and Yakima, Wash. The Corps of Engineers also want $192,000,000 for Rivers and Harbors work.

The Bonneville people want $20,278,000 for transmission lines, and the Southwestern Power Administration wants $6,622,000. TVA, incidentally, asks for $47,000,000 more next year; and it is interesting to note the Atomic Energy Commission, Lilienthal's new occupation, wants the not inconsiderable sum of $693,000,000.

The fiscal forecast

What is apt to happen? No one really knows, but if present tempers continue to prevail there will be substantial tax reductions, somewhere between 10 and 15 per cent; there will be considerable increase in the national defense budget, now estimated at somewhere between $12,000,000,000 and $18,000,000,000; the regular agencies will be cut about 30 per cent, and the Reclamation Bureau, Geological Survey, and Corps of Engineers (civil budget), will be slashed at least 50 per cent.

But bear in mind that there may be much modification in all this economy-thinking before the final appropriations are passed by Congress. There is growing thought here that we must again supply vast quantities of food for the suffering folk of Asia and Europe; and there is a strenuous desire to avoid action that may make either party appear to be in opposition to the urgent desires and needs of those who will have a deci-

sive influence upon the 1948 elections.

Also bear in mind, that most of the planning and deciding will be done by men like Rep. Taber of New York, head of the Appropriations Committee of the House, and Rep. Jones, of Ohio, who do not like the Reclamation set-up as it is presently constituted. The Eastern brethren definitely are in the saddle, and appear to be setting the fiscal pace. They are very sharply opposed to the public power program that appears to be the policy of the Interior Department.

They see great regional power circuits springing up, with Reclamation assistance, in the Southwest, in the Missouri Basin, in the Columbia Basin, in the Colorado Basin, in the Arkansas Basin, in the St. Lawrence area, and even in New England. The other day Mrs. Rogers, the liberal member from Massachusetts, introduced HR 1056 which would provide for an examination and survey of the rivers of the New England States to further the program for the generation of electric energy in these States. Rep. Dirksen introduced HR 59 to establish the Office of Power Administrator to set up a nation-wide public power administrative, regulation, and sales agency.

Rep. Rankin introduced HR 502 which under the color of creating a series of conservation authorities would do about the same thing as is aimed at by Dirksen, only with far wider powers and more social implications. It virtually would take over the country as the basis for creating a chain of public power circuits.

Congressional business

It is estimated during the first 15 days of January over 2,500 bills were introduced in both chambers of Congress. Most of these, obviously, are intended as a gesture for homefolks. But a substantial number are intended for action. Yet, withal, the purely business machinery of Congress seems to be in a melluvahess. Fundamentally, thus far, it has been touch and go whether or not the Republicans in the Senate could keep its majority in line. There are 51 Republican Senators, and 44 Democrats, since Bilbo is at least temporarily out. On the first party division the Republicans squeaked through by the narrow margin of 47 to 45. Four Republicans, Morse of Oregon, Aiken of Vermont, Cooper of Kentucky, and Tobey of New Hampshire voted with the Democrats. There is little doubt that Reed of Kansas would have voted with the Democrats, except that he had a pair, or a cancelling standoff, with the Democrat Wagner, of New York. If Pappy O'Daniel, the Texas Senator, a Democrat, had not voted with the Republicans they would have lost the first division.

Why this situation? The Republicans who are playing the aces wild are sore. Most of them are sore because they did not receive the Committee appointments they want, and they think they deserved, while other Republicans received more than their share of the appointments. Clif Stratton, the veteran correspondent for the Capper newspapers of Kansas, says it reminds him of the situation in

MALONE of NEVADA

Coolidge's time, when the Republicans had a paper majority of 11, but the "Sons of the Wild Jackass," led by Norris of Nebraska, kept the Republicans in a dither almost all the time. Clif says the insurgent Republicans of the Coolidge era were individualistic and nationalistic, while these Liberals in the Republican ranks are definitely New Dealish. You are apt to see some funny things here in the next three or four months.

One of the most unhappy situations is that which has set many of the functioning committees of Congress awry. These committees, as you know, are the business machine of Congress. The members, to a large extent, are the untrained front while the committees, with their trained professional staffs, do the hard detailed work. Under the new reorganization, specialists of various kinds, ranging in salary from $7,000 to $10,000 per year, have been added. The assumption has been that most of these people, as well as the old staffs, would be chosen for trained merit, not to fulfill the demands of patronage. The clerk of a committee usually has abilities as a coordinator, knows the history of legislation, is a specialist in preparing laws, and has had some legal and business experience. Even during the 16 years of the New Deal they did not attempt to make these jobs patronage, very often.

At present, in many cases, the entire staffs of the committees are functioning on a temporary or acting basis, and are therefore, uncertain about their jobs. They know that often the chairmen of the committees are under pressure to give the juicy jobs to persons who probably have no real training. There are usually 4 such jobs in the higher salaried brackets, and at least six more which pay decent money. The new law says that within the range of the brackets, the salary is to be fixed by the chairman. So long as he has not been able to get an agreement from his associates about the disposition of the appointments he often makes the temporary or acting appointments at the lowest possible scale. It is not difficult to appreciate why many of the committee staffs are unhappy, unsure, and are not inclined to put their best into the jobs. Meanwhile, if you come to the Capital you will find your business suffers. It hits you as an individual and as a businessman.

The engineer Senator

The coming of new Republican Senator George Wilson Malone to Washington to represent the state of Nevada, is one of the most advantageous breaks that could have happened for the West.

He is the only real engineer in the whole Congress with actual world-wide field experience in reclamation, power, flood control, municipal work, industrial engineering, mining, and related problems. He is a graduate of the University of Nevada, a former State Engineer of that state, and one-time secretary of its Colorado River Commission. During the war he was a special consultant to the Senate Military Affairs Committee and to the Secretary of War on strategic minerals and materials. In the first world war he rose from private to major. He was once amateur middleweight boxing champion of the Pacific Coast.

His Encyclopedia of the Industrial West is a monumental work, the finest and most complete reference work on Western resources and developments ever to be assembled and published. It is doubtful if any other Senator is so well acquainted with the conditions and problems of the Western half of the United States as is George Malone, or is as well equipped with the technical and scientific training and experience required for solving those problems.

New Congress Reopens Tidelands Legislation

TIDELANDS legislation, passed by the Seventy-ninth Congress last July and subsequently vetoed by President Truman, is again in the limelight with the recent introduction by the new congress of three new bills.

The new measures, substantially the same as the vetoed H. J. Res. 225, are:

S. J. Res. 14, introduced by Senators E. H. Moore, Republican, of Oklahoma; William F. Knowland, Republican, of California; and Pat McCarran, Democrat, of Nevada.

H. J. Res. 51, introduced by Rep. F. Edward Hebert, Democrat, of Louisiana, and H. J. Res. 52, introduced by Rep. Carl Hinshaw, Republican, of California.

The legislation passed last July recognized clear title to the states for tidelands in the territorial waters offshore to the three-mile limit and renounced all federal claim to title on lands submerged beneath navigable streams within the boundaries of the states. The executive veto on this measure was explained as based upon the fact that the Supreme Court had not passed upon the federal government's claim to such tidelands.

Argument on the case is expected to be heard by the Court next month.

Boise Council Grants Paving Time Extension

THE CITY COUNCIL of Boise, Idaho, recently granted an extension of time until May 1, to permit J. A. Terteling and Son, contractors, to complete the paving portion of the city's extensive street-widening program.

The project was originally scheduled for completion Dec. 1, but a previous extension to Jan. 1 was granted. Almost continuous bad weather in November and early December, unusually heavy traffic despite the torn-up condition of the streets, and the progress of numerous private construction projects in the downtown area were cited as the reasons for inability to complete the contract on the original deadline.

Thirty-one blocks in the business section are involved in the street widening program. The streets are being widened from 40 and 44 ft. to 52 ft. Capitol Boulevard was widened to a width of 60 ft. Resetting parking meters and light posts, and moving of basements were involved in the work.

Idaho Power Co. at the same time had circuit changes made, while excavation work was in progress, as part of the firm's extensive underground changing project. Mountain States Telephone and Telegraph Co. also had four blocks of conduit installed.

While this work was in progress, City Electric was busy installing a new traffic control system for the city under a contract of $24,485. Terteling's contract for the street widening and paving was at a figure of $179,786, according to City Engineer J. F. McBirney.

In the meanwhile, traffic over the surface during the winter months will cause good compaction on the new street portions and will provide a good base for putting down pavements in the spring, Terteling engineers say.

Northwest Power Line Receives Final Approval

EARLY CONSTRUCTION of a 115,000-volt transmission line from The Dalles, Ore., to Goldendale, Wash., to serve the Klickitat County Public Utility district has been assured as a result of final approval of the project by Bonneville Power Administration.

Bonneville engineers will begin construction of the new line not later than May 1, 1947, with completion scheduled for September 1, 1947. Surveys are complete and all necessary materials are on hand for the first stage of the $430,000 transmission line, which will assure a large supply of Columbia river power in the area.

Klickitat PUD plans to take over all Pacific Power & Light company lines in the county for $670,070, the purchase price set Nov. 21 by a federal jury in a condemnation proceeding.

PUD officials advised the Administration that they expect the power load at Goldendale to double from 1,500 to 3,000 kw. as soon as Bonneville power is available, and the load is estimated to grow to 5,100 kw. by 1952.

The 24.1-mi. transmission line to Goldendale will be of the "H"-frame wood pole type of construction, and will deliver power to a temporary substation at Goldendale. This substation will later be replaced with permanent facilities as soon as materials become available.

Final Phase of Ross Dam Construction Ready for Bid

PLANS FOR THE COMPLETION of Ross dam will be ready for issue to contractors by late February or early March, and the Department of Lighting of the city of Seattle expects to call for bids to be opened early in April. The work to be placed under contract constitutes the third and final step in the construction of the concrete arch dam in Skagit County, Washington. Construction of the second step, now being carried out by the General Construction Co., in joint venture with Morrison-Knudsen Co., Inc., J. F. Shea Co., and Winston Brothers Co., is expected to be completed about June of this year.

OBITUARIES . . .

George H. Wilson, Jr., former San Francisco contractor who rebuilt the Le Havre docks as an Army captain following the First World War, died recently at the Sawtelle Veterans' Hospital in Los Angeles. Wilson had been connected with the Army as a civilian engineer since 1935, and was cited by the War Department for outstanding service.

* * *

George C. Arrowsmith, 76, irrigation engineer for the Bonneville Power Administration, was killed in an automobile accident late in November while making a field survey near Burns, Ore. One of the Northwest's outstanding pioneers in irrigation, Mr. Arrowsmith had been chief engineer of the Yakima Water, Light and Power Co., general superintendent of its successor, the Northwest Light and Power Co., and electrical superintendent and efficiency engineer for the Union Pacific railroad, as well as resident engineer on a number of public works projects.

* * *

Chauncey H. Smith, 50, manager of the Seattle chapter of the Associated General Contractors, died in Seattle Dec. 13, following several months' illness. He had been manager of the Seattle chapter for the past four years. Prior to his association with the chapter he had been employed by the Seattle Gas Co.

* * *

Carl H. Mossberg, 64, former Salt Lake City building contractor, died Jan. 17 in a Palm Springs, Calif., hospital of a bronchial ailment. He was an active residential contractor and real estate man in the Utah capital for many years. He had lived in Baldwin Park, Calif., for the past several years.

Arthur William Deuel died in San Mateo, Calif., on Jan. 3, at the age of 63. When the San Mateo-Hayward Bridge was built some years ago, he was one of the engineers in charge of construction. He was at one time president of the San Francisco Bay Toll Bridge Co., and during his twenty-one years residence in San Mateo, served the community as a member of various commissions and boards.

* * *

Fred F. Rice, 59, office manager in the Portland office and assistant secretary of the Guy F. Atkinson Co., died in Portland Jan. 9. He was a native of Texas, and had been a resident of Seattle from 1923 until the Atkinson northwest office was moved to Portland last summer.

* * *

Frank I. Doane, 59, died Jan. 7 at his home in Berkeley, Calif. He was well known in the San Francisco Bay area. During the past twelve years he was in the employ of the State Highway Department as a mechanical and electrical engineer.

* * *

Nelson J. Littlejohn, 87, a pioneer contractor of central Montana, died in Lewistown, Mont., Jan. 7. About 1900 he was engaged in laying the original wood water supply line into Lewistown, and constructed the first water supply systems in Roundup and Libby, Mont.

* * *

Jean M. Simons, 34, assistant manager of the Spokane Concrete Pipe Co. plant, died in Spokane Jan. 3. He had been assistant manager of the plant for the past five years.

* * *

Henry W. Schlueter, a resident of Beverly Hills, Calif., died there recently at the age of 85. He was a commercial and public building engineer and constructor.

* * *

Harold N. Hamilton, 45, superintendent for McDougall & Dixon, building contractors of Seattle, died Jan. 1, in Seattle.

* * *

William O. Harris, 54, president of the Builders Association and secretary-manager of the Southern California Chapter of the Home Builders' Institute of America, died on Jan. 6 in Glendale, Calif., where he resided.

* * *

William E. Winburn, 66, bridge foreman for Union County, Oregon, died in La Grande on Dec. 3.

* * *

John Grover Mickelsen, contractor and builder, Dayton, Ida., died Jan. 6 at his home following a lingering illness. He was 59.

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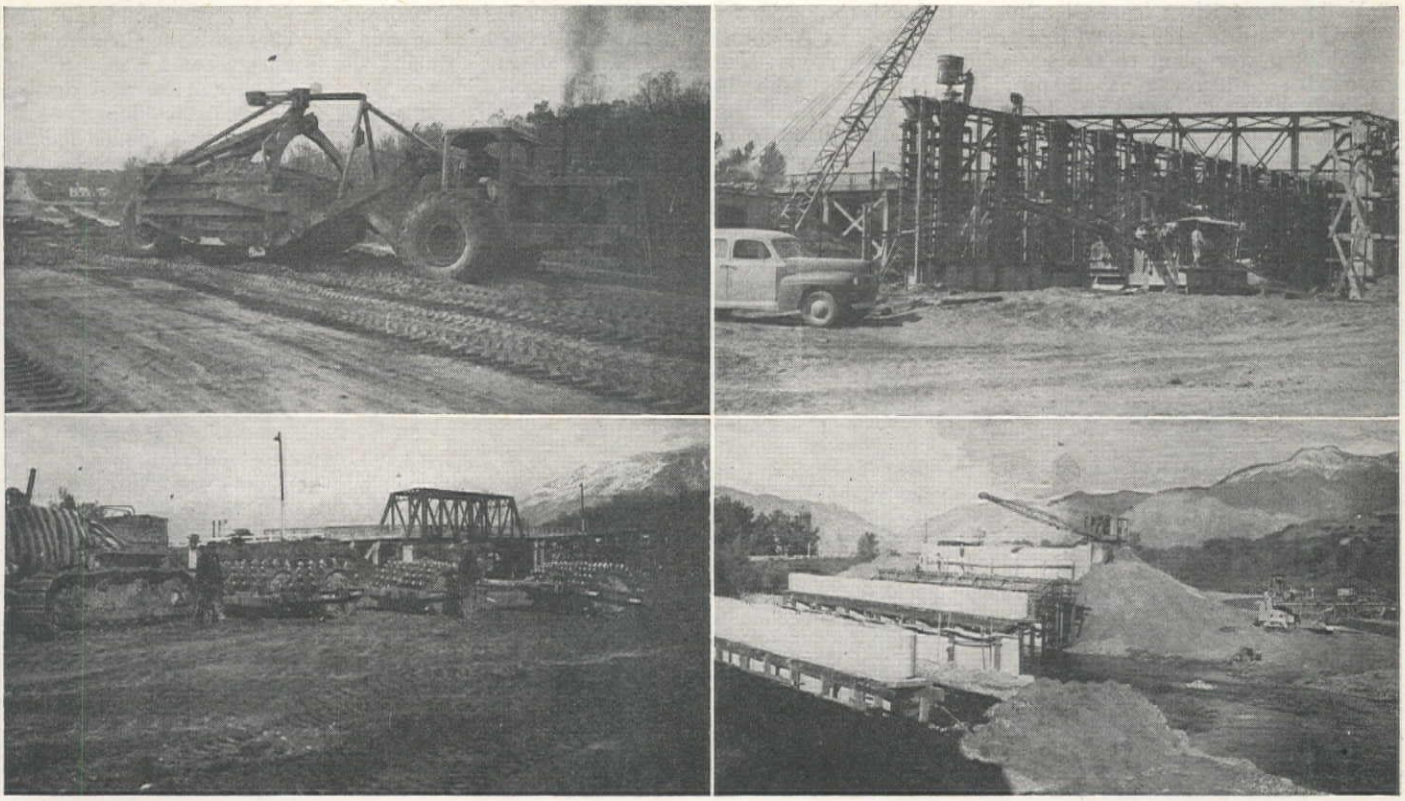
O. P. West, 57, civil engineer for the Mountain States Power Co., died in Albany, Ore., Nov. 1.



EQUIPMENT AT WORK on the Riverdale Overpass, being constructed by Gibbons & Reed, Salt Lake City, for the Utah Road Commission south of Ogden, Utah. A feature article on this half-million dollar project appeared in the December issue of *Western Construction News*. The project is temporarily halted on account of severe winter weather. Upper left, a Tournapull at the borrow pit; all fill was hauled by this type of conveyance. Upper right, paver mixing concrete for bridge piers; it is lifted to the pouring point in buckets by a mobile crane. Lower left, a string of sheepsfoot rollers on the new fill. Lower right, another view of the crane hoisting buckets of concrete for placement higher up on the piers of the Weber River crossing.

Early End to Material Shortages Prophesied

SHORTAGES OF building materials and equipment will disappear during the early months of 1947, and an oversupply of many products will develop soon after the first of the year unless Federal restrictions on non-housing construction are removed or drastically modified in the immediate future, the Building Products Institute declares.

Building costs should decline gradually throughout the new year as a result of greater availability of low-cost standard materials, the return of free competition to the building industry, and increased productivity on the part of on-site construction workers.

"Unless strikes interfere seriously, there should be enough materials for 1,200,000 new permanent type homes in 1947, although it is not likely that there will be more than 1,000,000 completions during the year, as compared with about 450,000 in 1946.

"In addition, unless production of materials is discouraged as a result of continued restriction of non-housing construction, there can be enough materials for about $5 billion of new industrial, commercial, and other private construction, $3.5 billion of public works, and $6 billion of repair and maintenance. The total volume of all construction in 1947 should approximate $19 billion to $20 billion, as compared with about $15 billion in 1946.

"Inventories of materials in the hands of manufacturers and distributors should increase substantially during the remaining cold weather months, when production of most building products will exceed the quantity being put in place," according to the Institute.

Suit by Texas Company Cancels Russian Order

THE GOVERNMENT of Russia planned to take over an order for 33,000 tons of pipe which the United Nations Relief and Rehabilitation cancelled. However, the El Paso Natural Gas Company of Texas filed suit to prevent the A. O. Smith Corporation of Milwaukee, Wis., manufacturers of the pipe, from delivering it to Russia before the Texas company's $54,000,000 order had been filled.

Paul Kayser, president of the El Paso Natural Gas Company stated that his company had placed its order on Aug. 6, 1945, while the U.N.R.R.A. order had not been placed until Feb., 1946. Kayser believed that the Russians should be required to take their place in line as if they were placing an order now.

Federal District Judge Charles A. Boynton ruled on Dec. 20, that the Milwaukee manufacturer may not enter into any contract with Russia that would delay fulfillment of his contract to manufacture pipe for a natural gas pipe line to California.

The court found that the United States Treasury Department had contracted with the Smith corporation last Feb. 5, 1946 for the steel pipe for U.N.R.R.A. and ultimately consigned to the Soviet Union, but ruled that this contract had been cancelled.

The agreed judgment entered on Dec. 20, in the injunction suit contains a schedule for deliveries of pipe to build a 26-in. line which will carry natural gas from west Texas and New Mexico to California. Company officials believe that this will permit completion of the project in the fall of 1947.

Transmission Lines to Be Built in Montana

TRANSMISSION LINE construction will account for a good share of activity in Montana this year. Morrison-Knudsen Co., Inc., has been awarded a $3,289,700 contract by the Bureau of Reclamation for construction of a 115,000-volt line for distribution of power generated at Fort Peck dam, and the Montana Power Co. is presently making pre-construction surveys for a 100,000-volt line between Billings and Great Falls which is estimated to cost about $1,000,000.

The Morrison-Knudsen contract calls for construction of 78 mi. of line along

the Yellowstone River from Glendive to Miles City, and for 139 mi. of line from Fort Peck power plant to the site of a proposed substation at Williston, N. Dak. It is planned to build an additional 179 mi. of transmission line from Williston to the Garrison dam construction substation, 23 mi. northeast of Hazen, N. Dak., to provide power for the construction of that Missouri River project.

The project of the Montana Power Co. will double the capacity of present electrical energy transmission lines from the four generating plants near Great Falls to Billings and the south central part of the state.

Accidental Death Rate for 1946 Heaviest in Nevada

THE DEATHS of 88 persons in highway mishaps within an eleven month period in 1946 makes Nevada, the smallest state in population, the leader in accidental deaths per capita, it was disclosed recently by State highway officials.

According to national safety council statistics, Nevada had 15.9 fatalities per 10,000 population last year. The report listed the next four "most dangerous states" as Arizona with 11.8 deaths per 10,000 persons; Montana 11.4; Wyoming 11; and Idaho 10.3. California ranks seventh with 9.3.

In addition to the Nevada death toll of 88, highway officials reported 773 persons injured in the 1323 accidents listed. The age of those killed ranged from five to 65 years.

The Editor's Mail...

El Monte, Calif.

Dear Sir:

A few lines to inform you that I have not worked at my trade since Jan. 18, 1944. Therefore I am not subscribing for the magazine any more. Now I am a chambermaid, and own my own Motel. Before I was a steam fitter.

Very truly yours,
WM. E. SAVAGE

Pinedale, Wyoming

Dear Sirs:

I have been subscribing to your magazine for several years, and would now like to add a few words regarding your editorial policy with which I have always found myself very much in accord. I spent a few years with the Government during the thirties when I was working at engineering. Now I am a structure contractor in this state doing State Highway work under the name Taylor and Allard. From my experience I know well the devious, inefficient, wasteful and undemocratic ways in which the Bureaus operate. I know there is a very real danger to our system of free government due to the selfish, unnecessary growth of the Bureaus. I know that a man, in order to be a good bureaucrat in a higher up position, must lean very strongly to the left. If he does not he would not be able to remain on the job as an honest American and be at peace with his own conscience.

Journals of your type must be supported by all of us who value a free existence and want to stop the spread of dictatorship thru the increase of Bureaus and Valley Authorities. So I feel that you must continue to oppose the present bureaucratic trend with the hopes that you and others like you may eventually gain enough support to stop its growth and reduce it to its proper size and place within our system of government.

Very truly yours,
A. F. ALLARD

PERSONALLY SPEAKING

Carl P. Vetter, chief of the Office of River Control of Region III of the Bureau of Reclamation, was recently invited to become a member of the United States Committee on Large Dams which will work with the International Commission on Large Dams of the World Power Conference, it was announced recently by Regional Director **E. A. Moritz** of Boulder, Nev. Commissioner **Michael W. Straus** of the Bureau of Reclamation will act as chairman of the United States committee. **John Lucian Savage, Frank A. Banks,** and **Samuel Brooks Morris,** all three internationally known engineers, were also asked to serve on the committee. Savage, former chief designing engineer with the Bureau, is now a consulting engineer. Banks is district manager of the Bureau's Columbia River District and formerly served as construction engineer at Grand Coulee Dam. Morris is general manager and chief engineer of the Department of Water and Power, City of Los Angeles.

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A Joint Cooperative Committee of the Associated General Contractors of America and the Associated Equipment Distributors has been recently established in Washington, D. C. The union of the two nation-wide organizations in a joint committee will provide a means through which contractors and equipment distributors can secure a better understanding of their mutual problems, and will enable cooperative action by A.G.C. chapters and branches and A.E.D. regional organizations in their respective communities. **John MacLeod** of Macco Construction Co., Clearwater, Calif., is a member of the six man committee representing A.G.C. **A. F. Garlinghouse,** Garlinghouse Bros. of Los Angeles, **P. A. Dufford** of Intermountain Equipment Co., Boise, Ida., and **R. E. Corson,** Ray Corson Machinery Co. of Denver, Colo., are three of the six committeemen representing A.E.D.

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Milton J. Brock has been reelected president of the Second Annual Construction Industries Exposition and Home Show to be held at Los Angeles, Calif., June 12th to 22nd, 1947. Brock is treasurer of the National Association of Home Builders, a director of the Building Contractors Association and a member of the Associated General Contractors. Also reelected as officers of the Home Show were: **Earl S. Anderson,** convention manager of the Los Angeles Chamber of Commerce, first vice-president; **Frank Jani,** a director of the Merchant Plumbers Association, second vice-president; **Lawrence B. Gibbs,** president of the Home Builders Institute, secretary; and **A. L. Stone,** past president of the National Electrical Contractors Association, treasurer. **Fred J. Tabery** was reappointed as managing director of the show and **D. D. Durr** as assistant managing director.

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H. Arthur Hook, veteran of nearly 20 years with the Civil Aeronautics Administration and predecessor organizations, was appointed to succeed **Charles B. Donaldson** as Assistant Administrator for Airports, it was announced recently in Washington, D. C. Hook's new assignment comes at a time when the CAA is embarking on its $500,000,000 Federal Aid Airport Program. Donaldson has transferred at his own request to the Sixth Region, where he will serve as Airport Engineer for the State of Nevada. He served as Assistant Administrator for Airports from 1941.

Cotton R. Wilcox, manager of the Mountain Pacific Chapter, Associated General Contractors, in Seattle has resigned to join the staff of the Washington Asphalt Co. Wilcox has been succeeded by **Paul C. Fredrickson** who has been with General Construction Co., Seattle. Wilcox had been manager of the chapter for the past year. Fredrickson, who served with the military government branch of the Army and was released last May with the rank of lieutenant colonel, has been personnel manager for the Boeing Aircraft Co., and building superintendent for the city of Seattle for a number of years prior to the war.

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Chester B. Morse, assistant regional forester in charge of Recreation and Lands for the California Region during the past ten years, has retired. He is succeeded by his former assistant, **Millard M. Barnum.** Morse retired with nearly forty years of continuous service in the national forests of Idaho, the Intermountain Regional headquarters at Ogden, Utah, and the California Regional Office in San Francisco, in numerous capacities. Barnum has been in the forest service for the past 30 years, coming to the regional office in San Francisco in 1934 where he has specialized in forest land use and valuation.

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Maurice Ahlquist, Walla Walla, was elected president of the Washington State Reclamation Association at the conclusion of the annual meeting of the association last December. He succeeds **George R. Thompson. John Scott,** Sequim, was elected first vice-president, and **Walter Row,** Naches, second vice-president. **Axel Strom,** executive secretary of the wage board, Washington State Department of Agri-

culture, was chosen as managing secretary of the association to succeed **Thomas B. Hill,** who is retiring because of illness. Among those elected to the board of directors of the association was **Lars Langloe,** consulting engineer of Olympia.

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Otto M. Christinson, Glasgow, Mont., was elected president of the Montana Reclamation Association at the annual meeting in Billings late in December. Christinson, who succeeds **Dan P. Thurber** of Great Falls, is also vice-president of the Missouri-Souris Projects Association which covers western North Dakota and eastern Montana. Other officers of the association for 1947 include **Oscar Balgord** of Lavinia, vice-president; **Don Luebbe** of Bozeman, secretary; and **R. C. Bricker** of Great Falls, treasurer.

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Ted Y. Johnston, manager of the highway division of Morrison-Knudsen Co., Inc., recently announced opening of new San Francisco offices, with room 614-618 in the Humboldt Bank Building, 785 Market St., as the locale. **Otto A. Semenza** officiates as office manager, with **John S. Heilmann** as office engineer. Both men are well known in Northern California construction circles. Johnston also announced application at this office will be for domestic employment only.

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Merle W. Ellis, engineer with the California State Highway Department, recently left San Francisco for Stockton, where he is resident engineer on highway construction in District X. During World War II, he served as a major with the Corps of Engineers on Okinawa. Before the war he was post engineer at McCord Field, and post engineer, Davis-Monthan Field, Tucson, Ariz.

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Frank W. Knowles, manager and vice-president of the Northwest Baker Ice Machine Co., and last year president of the Seattle Engineers' Club, and **James A. Callender,** structural engineer of Seattle, have organized a new firm to be known as Knowles and Callender Engineering Co., to specialize in the design and construction of quick freezing and cold storage plants. Callender was project engineer for the Austin Co. on various Navy projects during the war.

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W. C. Perkins, who was appointed chief engineer of the Union Pacific Railroad last month, is a native of Idaho and has served the road as district engineer at Salt Lake City, as well as system maintenance engineer and assistant chief engineer. Perkins succeeds **B. H. Prater,** who has been appointed engineering consultant for the road. Prater has served as maintenance of way engineer at Pocatello, Idaho, and as assistant and district engineer at Salt Lake City.

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Ned Hergert, who has been assistant manager of the Mountain Pacific chapter, Associated General Contractors, in Seattle since his release from the Army Air Forces last year, has been appointed manager for the Montana Contractors' Association. The Montana group, which is associated with the national group, has not employed a manager previously. Hergert will establish headquarters of the association in Helena, following his return from the national convention of the AGC in Chicago.

LT. COL. WILLIAM J. ELLISON, recently assigned to the Portland District, U. S. Engineer Dept., will serve as resident engineer during the construction of McNary dam on the Columbia River near Umatilla, Ore. As a civilian engineer, Col. Ellison was in charge of several phases of design and construction for Conchas dam on the South Canadian River in New Mexico. His first duty as an officer of the Corps of Engineers was in the Los Angeles District. During the war he served with various engineer units in the Pacific and the West Coast.

W. G. Sloan, until recently Assistant Regional Director of the Region VI office of the Bureau of Reclamation at Billings, Mont., has been assigned full-time duty as representative on the Missouri Basin Inter-Agency Committee, and temporary chairman of the Missouri Basin Field Committee. Succeeding him as Assistant Regional Director is **Kenneth F. Vernon,** who has served as Progress Control Officer, and has been on the Bureau staff for thirteen years. He has moved to the Billings headquarters to assume his new duties with Regional Director **H. D. Comstock.** Succeeding Vernon to the post of Acting Progress Control Officer is **A. O. Babb.**

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Guy C. Finley has been appointed as manager of the Yakima-Tieton Irrigation District in southern Washington to take office on March 1. He will assume management of the project after final repayment of construction costs has been made to the Bureau of Reclamation this month. Finley has been employed in the Seattle District, U. S. Engineer Department.

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Arthur F. Hartung, Russell G. Kincaid, C. Kelsey Mathews and **Earl J. Thomson** were recently named as members of the firm of Burns & McDonnell Engineering Co., consulting engineers of Kansas City, Mo. This increases the firm membership to eight, the other four being **R. E. McDonnell, C. A. Smith, R. L. Baldwin** and **R. H. McDonnell.** Hartung, who came to the firm eighteen years ago, specializes in electrical and power design. Kincaid has been with the firm twenty years and specializes in hydraulic work. Mathews is a civil engineer with twenty-four years' service with the firm, specializing in appraisals and sanitary works. Thomson specializes in water works, sewage treatment and power plants and has been associated with the firm for eleven years.

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Arthur Dixon, who has been with the Public Works Department of the Province of British Columbia for the past thirty years, recently resigned his position as deputy minister due to ill health. He has held this position for the past twelve years, during which time he directed the building of many thousands of miles of highway and the construction of innumerable public buildings throughout the province.

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C. Glen Smith has been appointed King County engineer, succeeding **Conrad O. Mannes.** Smith has appointed **Harry T. Gillis** as engineer in charge of the county's south road district, and **George Sparlin** as field engineer. **Phil W. Myers** has been retained in his position as office engineer. King County headquarters are in Seattle, Wash.

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R. L. Sanford of Long Beach, Calif., is Field Engineer in the Industrial Division of the Gates Rubber Co. of Los Angeles. His work deals with the design, application and sale of industrial rubber products in the territory covering Ventura, Santa Barbara and San Luis Obispo counties in California. Prior to his entrance into the Army, he was with the same company in the San Diego area.

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William R. Bandy, engineer with the General Land Office at Helena, Mont., has been appointed acting regional cadastral engineer for the Bureau of Land Management, a consolidation of the General Land Office and the U. S. Grazing Service. With headquarters in Helena, region four of the new bureau will serve Montana, Wyoming, North and South Dakota, Nebraska, Kansas, Iowa, and Missouri.

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Col. A. H. Garnsey and **K. E. Andrews,** city engineer and assistant city engineer, respectively, of Sidney, Australia, were visitors of **Charles L. Wartelle,** city engineer of Seattle, late in December. The Australians have been touring the world to gain late information in municipal engineering and traffic control, and exhibited special interest in the trackless trolleys operated in Seattle.

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J. S. Foster, consulting engineer, has been with the Lidgerwood Mfg. Co.'s Elizabeth, N. J. plant as vice-president and chief engineer of the company. With the sale of that plant Foster resigned these positions and continued his connection with the company's New York office as consulting engineer. He is also in private practice offering services involving the design and installation of cableways and hoisting equipment.

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P. R. Nalder, assistant office engineer for the Columbia Basin project of the Bureau of Reclamation, has been transferred to Washington, D. C., where he will serve as chief of the division of design and construction. Nalder has been at Grand

Coulee dam since 1933 except a period of service in the Army Air Forces when he served as a major in the South Pacific. He is a graduate of Washington State College in electrical engineering.

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W. P. Whitsett, who for the past eighteen years served as chairman of the board of directors of the Metropolitan Water District of Southern California, resigned the position January 6th. Whitsett, an outstanding figure in the development of Southern California water resources, was one of seven directors on the board, which has control over the affairs of the Colorado River Aqueduct, representing Los Angeles.

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Lowell M. Puckett, Regional Field Examiner of the Bureau of Land Management in Alaska, has become administrator of the new regional headquarters of the bureau in that territory. Puckett will have broad authority for rendering decisions on public land matters without incurring delays hitherto incident to submission to Washington for consideration.

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Everett E. Baxter has been appointed county road superintendent for Whatcom County, Washington, with headquarters at Bellingham. Baxter, who succeeds **E. R. Haxton,** was formerly district engineer at Bellingham for the Washington State Highway department.

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Lt. Cmdr. Robert A. Earle, Coast and Geodetic Survey, has been appointed supervisor of the midwestern district comprising Oregon and Idaho. For the past 18 months he has been in charge of the planimetric mapping project of Portland and vicinity, and will continue supervision of that project. As district supervisor he succeeds **Capt. Thomas J. Maher,** who is retiring.

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William D. Shannon, consulting civil engineer of Seattle and director from district 12 for the American Society of Civil Engineers, has been appointed to fill the unexpired term of the late **J. T. L. McNew,** vice-president of the society for Zone 4, who died at his home in Texas two months ago.

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Lewis E. Foster, Chief of the Allocation and Repayment Division of Region II of the Bureau of Reclamation, retired on January 1 after forty-five years of continuous government service, forty-one of which have been with the Bureau. For the last year and a half he has been located at the Sacramento, Calif., office.

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W. C. Morse, water superintendent for Seattle, has been reappointed as chairman of the municipal board of public works. Membership of the board includes the city engineer and the superintendent of the lighting department as well as the superintendent of the water department.

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R. R. Botsford is now established in business in Long Beach, Calif., as a registered Civil Engineer and General Contractor on engineering construction. During the war he served in the military forces as Lieutenant Colonel in the Corps of Engineers on several large construction projects including the Alaskan Highway and Canol projects.

John L. McCartney, maintenance foreman at the Cedar Falls headworks of the Seattle department of lighting, has retired after more than 45 years of service. In 1903 he was a member of the construction staff which built the Cedar River crib dam, first publicly owned hydroelectric structure in the country.

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Thomas Scalzo, general contractor of Seattle, has sold his interests to a partnership consisting of his three sons and retired from business last month. **Joseph A., Victor J.,** and **Robert J. Scalzo** will continue operation of the contracting firm which will be known as Thomas Scalzo Co.

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W. Allen Grubb, manager of the Steel Tank & Pipe division of the American Pipe & Construction Co., Portland, has been elected a vice-president of American Pipe and Construction. Prior to becoming manager of Steel Tank and Pipe several years ago, Grubb had been for many years regional engineer for the Portland Cement Association in Seattle.

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George A. Gregory, formerly construction engineer in charge of Alder dam and powerhouse for the Tacoma department of light and power, has sailed for China where he will be construction engineer for the National Hydroelectric Bureau of the National Resources Commission of the Chinese government.

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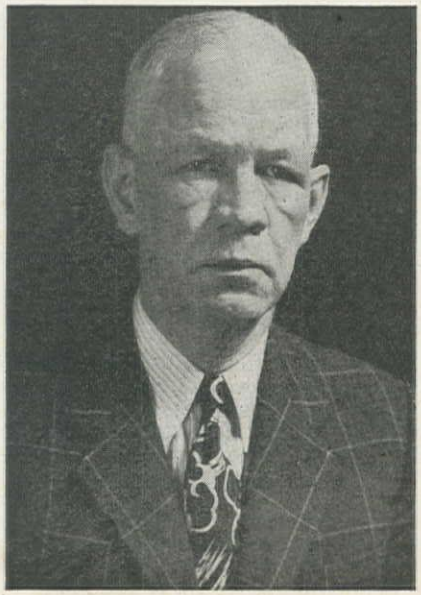
A. R. Kingaard, owner of the Pacific Construction Co., San Diego, Calif., is now associated with **Roberto Estudillo** in a concern known as Maquinaria Industrial, S. de R. L., with offices in Tijuana, Mexico. The new company is Allis-Chalmers foreign export representative for Mexico. The Pacific Construction Co. has done considerable work at Camp Pendleton, Calif.

WILLIS C. CHRISTOPHER, irrigation engineer with many years of service in the West, is assistant supervising engineer for the irrigation division of the Columbia Basin project in eastern Washington. He served as design engineer for the Metropolitan Water District of Southern California during construction of the Colorado River aqueduct, and has been irrigation consultant to the Mexican government. Just prior to his transfer to the Columbia Basin project he was chief of the branch of design and construction for region one of the Bureau of Reclamation at Boise, Idaho.



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Herman Blickensderfer, associate professor of civil engineering, and **H. R. Wilson,** instructor in civil engineering at the University of Idaho, have resigned their positions. Blickensderfer has accepted a faculty position at Bradley University. Wilson has joined the staff of an engineering firm in Portland.

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Fred M. Veatch, U. S. Geological Survey, was elected president of the Tacoma Engineers' Club at the last meeting of the year of the organization. **Carl F. Pflugmacher** was chosen vice-president, and **John Judy,** secretary-treasurer. **E. P. Antionovich** was elected committeeman of the executive council.

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John C. Stevens, consulting hydraulic engineer of Portland and a past president of the American Society of Civil Engineers, has been appointed as a member of a special committee on construction and civic development of the United States Chamber of Commerce.

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James E. Morrison, who has been manager of public utilities and city engineer for Renton, Wash., last month resigned as city engineer and has been succeeded by **Basil McHugh,** who has been assistant city engineer. Morrison will retain his position as manager of public utilities.

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Lee Howland, for many years sales engineer for the Waterworks Supply Co. at San Francisco and Los Angeles, later with the Metropolitan Water District of Southern California as chief inspector, is engineer and in charge of production at the plant of the Azusa Rock & Gravel Co. at Azusa, Calif.

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Weston Clark, formerly road foreman at the Blackfeet Indian Agency at Browning, Mont., has been appointed county road foreman for Glacier County at Cut Bank, Mont. He succeeds **Emil Peterson** who has resigned to enter private business.

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E. C. Bashey, engineer with the department of public works, Tacoma, Wash., has been appointed chief assistant engineer in charge of new construction. Bashey succeeds **Ray Green,** who has been assigned to the city planning commission.

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L. J. Dowell, president of L. J. Dowell, Inc., general contractors of Seattle, has resigned as public relations counselor for the Alaska region of Pan American Airways, a position he has held for the past year and a half. Dowell resigned in order to devote his full time to the construction field.

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Robert L. Hardman, formerly Major, C. E., U. S. Army, assigned to the Panama Canal in charge of field construction and maintenance of water distribution system, is now employed as engineer by the National Water Main Cleaning Co. of New York City.

Francis H. Murphy, who recently retired as consulting electrical engineer for the Portland General Electric Co. after 35 years of service with the company, has opened a private consulting office in Portland where he will specialize in electric wiring installations, illumination, and street lighting.

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Elmer E. Gunnette has been appointed district engineer in charge of the newly opened Seattle office of the American Institute of Steel Construction.

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Roger V. Gillam, structural engineer of Portland, has joined the recently organized engineering firm of Sidney P. Lathrop and Associates in Portland. Formerly connected with Timber Structures, Inc., Gillam will specialize in timber design.

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Stillman E. Neff, who was recalled to active duty in November with the rank of major, is now Air Installations Officer at the Sedalia Army Air Field, Warrensburg, Mo. Neff is base engineer and supervises all engineering activities there.

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J. G. McGivern, dean of the college of engineering at Gonzaga University, Spokane, Wash., was elected president of the Northwest Scientific Association at the 20th annual meeting of the association in Spokane last December.

SUPERVISING THE JOBS

W. J. Aiken and **G. W. Anderson** are the superintendents for the excavation and general construction work on the Hyperion activated sludge plant at El Segundo, Calif., being built by the city of Los Angeles. Among the key personnel are the following men: resident engineer **Charles T. Poppe;** associate engineer **Don Carlson;** project manager **A. E. Randall;** master mechanic **Ray Bailey;** office manager **Gordon L. Hammonds;** purchasing agent **E. L. Crawford.** Foremen on the job are: **Eric Carlson,** dredging; **Ray Travis,** grading; **Dennis Lewis,** electrical. Contract for this portion of the work is held by Peter Kiewit Sons' Co., and Construction Aggregates Corp., San Francisco, in joint venture, and the work is estimated to continue for two years.

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Emmet F. (Bromo) Seltzer is master mechanic for the Bechtel Corporation, successors to Bechtel Bros., McCone Co., at their construction and somastic pipe line division in the Watson area in California. **William Morgan** is master mechanic for the somastic department, **Hal Stone** plant superintendent, **W. H. Atkins** general foreman, and **Milton Pirott** operator. The Somastic Division was acquired by Bechtel Bros., McCone Co. early in 1946 from the Industrial Engineering Co.

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Del Martin is superintendent for Haddock Co. on additions to the plant of the Riverside Portland Cement Co. at Oro Grande, Calif. **A. W. Toner, Floyd D. Hopkins** and **Joe Armendariz** are carpenter foremen; **J. B. Merrill,** electrical foreman; **Leo Johnson,** structural steel foreman; **Leon Campbell** and **L. C. Wardlow,** mill foremen; **Chuck Johnson,** truck foreman; and **McDonald Hamilton,** cost engineer. **Helen V. Luttmers** is in charge of accounting for the two-year job, which has just begun.

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W. F. Rennebohn, assisted by **Hank Ewert** is superintending the excavation and lining work on the All American Canal at Thermal, Calif., a Bureau of Reclamation project. Also located on the job are **Sam Kahler,** grading foreman; **Lloyd Owens,** concrete foreman; **Fritz Todd,** steel foreman, with **"Slim" Doyne** master mechanic. **C. S. Hale,** who was on the Columbia Basin Project in Washington before transferring to the All American Canal in California, is construction engineer for the Bureau of Reclamation.

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S. G. Zynda is general superintendent for LeFevre Contractors at Van Nuys, Calif., where the company is constructing a high school building at 13645 Riverside Dr. for Notre Dame University. The building will be a two-story, 38′ x 312′, steel and concrete structure. Key men on the job are: **Chas. Markwith,** general foreman; **Michael Hunter,** steel superintendent; **Hank Grady,** labor foreman; **Tom Kilian,** steel foreman; and **Lyle Laub,** timekeeper. **Carl E. Malchow** of the F. D. Reed Plumbing Co. is plumbing superintendent, **L. D. Viole,** resident engineer.

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Jack A. Walton is general superintendent on the construction of a housing project at Van Owen and Whitsett Sts., No. Hollywood, Calif. The units are being built by Kaiser Community Homes for themselves. The project when completed will consist of 900 dwellings costing $5,500,000. **E. E. Dusterhoff** is assistant superintendent on the job. Carpenter foremen are: **Wm. Simmons, Wm. Wells, Plymouth Scrivner, M. D. Nordeen,** and **Harry Durst. Ray Belcher** is office manager.

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William Rheaume is general superintendent for Waale, Camplan Co. & Smith, Inc., Los Angeles contractors, who are erecting the high school at Palm Springs, Calif. Among the key personnel are the following: **Don E. Paeratt,** project manager; **Archie Hicks,** carpenter foreman; **G. Joseph Summers,** labor foreman; **Percy Sanders,** roofing foreman. **Frank Dwyer** is office manager. Resident Engineer is **Harry J. Williams. C. E. Moulton** is building inspector for the State.

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L. A. Walsh, general superintendent, and **A. Moore, M. Martinsen, C. E. Durkee, H. Wielhouwer,** carpenter foremen, together with **J. McGraw,** labor foreman, are employed on the 2-story and basement steel and concrete store building under construction for Bullocks, Inc., at Palm Springs, Calif. P. J. Walker Co., Los Angeles, has the contract. Other key men connected with the job are: **J. D. Timmons,** resident engineer; **R. C. Marr,** office manager, **C. L. Lawrance,** materials clerk and **R. J. Lidikay,** paymaster.

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Alford Co., tools and dies, steel fabrication firm, is erecting a new factory building at 2928 San Fernando Rd., Burbank, Calif. Steel erection contractor for them is Smith Bros., with superintendent **Tom A. Watson** in charge of this construction. **A. V. Versalovich** who has been with Smith for twenty years, is crane operator. The sub-contract for concrete was awarded to Geo. A. Allen, with **Ed Allen** acting as concrete foreman and **Bob Farnie** electrical foreman. This is a steel and concrete building, 101 x 127 ft., with 10-ton overhead crane.

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Rodney J. Hill is superintendent for J. R. Reeves, Sacramento, Calif., who was recently awarded contract at a cost of $131,304 for street improvements in Sacramento. **Chester H. Hodson** is the concrete foreman. **Keith Bahrenburg,** formerly of the Wyoming Highway Department, and later superintendent of construction for A. H. Reed of Cheyenne, and in 1942 with the Boeing Aircraft Co., at Seattle, Wash., is serving as engineer on this construction job.

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T. H. "Tom" Kelly is supervising the work for Peter Kiewit Sons' Co. on the State Highway job east of Ontario to Mira Loma, Calif. The work involves grading, paving, bridges and culverts. Some of the other key personnel are: assistant superintendent **Al Galbraeth,** night superintendent **R. W. "Bob" Westfall,** office manager **Ken Morris,** and foremen **George Stover,** grading; **O. A. Saalfeld,** carpenter; **Morris Kennedy,** shop, and **Albert M. Ragus,** Euclid.

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The Wm. Simpson Construction Co., of Los Angeles, Calif., holds the construction contract for a factory and office building at 2940 E. Foothill Blvd., Pasadena, Calif., awarded by the Avon Products Co. Field superintendent is **Carl Marquardt;** general superintendent, **Andrew Moe;** general carpenter foreman, **Whitey Shuldburg;** other carpenter foremen are **Jack Andor, Nelson Kroner, Gregor Relling** and **Arthur Laws.** Office manager is **J. W. Botsford.** Other key men are **Robert Swaithes** and **E. L. Hoffman.**

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N. A. Ayres is superintendent for L. E. Dixon Co. on this company's $1,000,000 contract for addition to the Hollywood Turf Club at Inglewood, Calif. Other key men on the job are: **V. T. Whited,** general carpenter foreman, assisted by **Gene Gaither; Cecil Yeager,** labor foreman; and purchasing agent **B. R. Beckner.** Job engineer is **Henry Lane.** Arthur Froelich is the architect.

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Stanley Bent, Jr., who with his father **Stanley Bent, Sr.,** formed Bent Construction Co. to succeed the well known firm of Bent Bros. Co. of Los Angeles, Calif., is in charge of the San Felipe and Lone Pine Bridge jobs now under construction south of Westmorland, Calif. Water supply at

the San Felipe Bridge location presented a problem that the contractor solved by resorting to the use of four surplus 3,000-gal. rubber tanks, hauling water in these tanks for 20 mi., then pumping it into an elevated tank erected on the job site. **C. P. Milburn** is superintendent on the $245,000 job.

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Joseph P. Marshall is general superintendent and **Harold Tebbitts** is assistant superintendent for the Wm. Simpson Co. on the construction of a class A telephone building the company is building in Burbank, Calif. for the Southern California Telephone Co. The contract calls for three stories and part basement, 100′ x 140′. The building was designed for five stories. **Sam Hobbs** is office manager for the company.

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H. C. Studer is supervising construction for Peter Kiewit Sons Co., Arcadia, Calif., on a 4.5 mi. grading and paving job between Latigo Canyon and Malibu Creek in Los Angeles County, which the company is doing for the California State Highway Dept. **E. L. Seitz** is resident engineer and **John F. McLaughlin** is job engineer. Other key men are: **"Spec" Willis,** grade superintendent, and **Ralph Bitter,** grade foreman.

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Dick Hollingshead is in charge of construction for Butress & McClellan Co. on a telephone building going up at 3640 So. Fairfax, Los Angeles, Calif. The job is being done for the Southern California Telephone Co. **J. H. McDonald** is job engineer for Buttress & McClellan and **Wm. W. Steinbrenner** is general carpenter foreman. The contract calls for a 165′ x 60′, one-story, reinforced concrete office building and garage with a 58′ x 30′ wing.

* * *

C. H. Keefer is construction superintendent for the Aluminum Company of America; **G. B. Ebbert** is foreman for Swanstrom and Stahl, general contractors of Oakland, Calif., who are remodeling Alcoa's T.A.C.U. warehouse and adding new offices at an estimated cost of $75,000. The warehouse is located at 45th & Adeline Sts. in Oakland.

* * *

Louie Diehl, general superintendent for the Los Angeles Board of Public Works, is supervising the grading and paving of by-pass between Sepulveda Blvd. and Imperial Highway. He is assisted by **C. H. Wicks** as grading foreman. **J. A. Leiva** is resident engineer, assisted by **P. C. Bagley.** This is a $62,492 job recently awarded to Frank T. Hickey, Inc., Los Angeles.

* * *

Edward Nimmergood, well known construction man, is general superintendent for American Bridge Co. on the bascule bridge and approaches over Cerritos Channel, to Terminal Island, Calif. Engineers on the project are **Carroll Petersen,** resident engineer, and **Harry M. Campbell, Jr.** Foremen are **Fred Robinson** and **Mack Smith. Wallie Hedberg** is paymaster.

* * *

Frank Evans, general superintendent for C. G. Chamberlin is supervising the construction of a youth center at Palm Springs, Calif. He is assisted by **C. G. Meyer,** carpenter foreman on the job. **W. J. Taylor,** another Palm Springs contractor, has the sub-contract for the concrete work, with **John B. Arata, Jr.,** in the foreman spot.

Bill Wheeler is superintending the construction of a 1-story, reinforced concrete addition to the Fibreboard Products Co. plant at Stockton, Calif. The concrete foreman is **Bill Smith.** This is a $408,460 job recently awarded to Shepherd & Green, contractors of Stockton, Calif.

* * *

Harold C. Adler is project manager for the Adler Construction Co., Portland, in charge of an 11.7 mi. extension of the main canal on the north unit of the Deschutes project near Madras, Ore., in the central part of the state. Two 8-hr. shifts are being worked on the job. The work is being done for the Bureau of Reclamation.

* * *

Henry Burkhammer is project manager for the Bechtel Corporation on the new building for Marine Engraving & Supply Co. being erected adjoining the Bechtel somastic plant in the Watson area in California. Representing the Marine organization is **H. J. Brubaker.**

Palo Barnes is supervising unloading work of several shiploads of surplus heavy construction equipment in Los Angeles for the W. M. Barnes Co. Barnes also supervised loading of the material at Guam. Other key men on the unloading job are: **F. W. Beresford,** administrative officer; **Jerry Clark,** in charge of sales; and **Frank Donohue,** formerly with Consolidated Steel, Maywood division, in charge of unloading and distributing.

* * *

Martin Peterson is supervising the construction of a freight warehouse at Missoula, Mont., being constructed for the Northern Pacific railway by the Boespflug Construction Co., Seattle. **G. J. Golinger** is representing the engineering department of the railroad on the job.

* * *

Fred C. Harris, as job superintendent in the yard of Winston Bros. Co. at El Monte, Calif., is facilitating the removal of material for the company's road job on the Douglas Stafford Highway in Arizona. **Ruben Habeck** is master mechanic. **Fred C. Harris** is grade foreman on temporary duty there.

* * *

Al Bretlow is job superintendent for Barrett & Hilp, contractors of San Francisco, Calif., on their $150,000 contract to remodel a 3-story building at 410 Bush St., in San Francisco. **Frank Kelly** is timekeeper.

* * *

W. E. Grant, former Naval Construction Inspector in the San Diego area, is now located in Denver, Colo., and is heading his own business. Grant does small amounts of cabinet and millwork at present, and intends to move and expand when the machine and tool market improves.

* * *

V. A. Edgren, for twenty years with Myers Bros. of Los Angeles, Calif., is now superintendent for the same company on extension to the Earl M. Jorgenson Co. building on So. Alameda St. in Los Angeles.

* * *

T. M. McDaniel is superintendent and **W. Gallagher** office manager for Denni Corporation, Wilmington, Calif., on their City Creek state highway job in San Bernardino County, Calif.

* * *

Dan Fiorito is supervising the clearing, grading, and surfacing of a 3.7 mile area near Contractor's Gulch, Wash., for the N. Fiorito Co. of Seattle. **Art Bechtel** is clearing and grading foreman.

* * *

W. Whiteman, for several years in a key capacity for Case Construction Co., is at present foreman on their pile driver work in the San Diego area. New name of the company is Johnson Western Co.

* * *

H. L. Hendrix, formerly in key positions with E. A. Kaiser Co. and others in the Southwest, is now in business for himself as a general contractor, with headquarters at 263 Prospect, Long Beach, Calif.

* * *

R. E. Martin is superintendent for R. H. Martin, Tucson, Ariz., who has the contract for a 10.3 mi. road job on the Douglas-Safford Highway, east of Pearce, Ariz. **R. H. Martin** is manager.

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UNIT BID SUMMARY

Water Supply . . .

California—Contra Costa County—District—Pipeline Construction

Western Pipe & Steel Co., San Francisco, submitted the low bid of $4,508,532 on Schedule 1, P. & J. Artukovich, Los Angeles, was low on Schedule 2 at $1,902,798, and American Pipe & Construction Co., South Gate, was low at $6,879,950 on Schedule 3 to the East Bay Municipal Utility District, Oakland, to furnish and install steel or concrete pipe for the Second Mokelumne Aqueduct, Unit B, 32 mi. of 67-in. and 68-in. I.D. pipeline will be constructed from Geary Road in Walnut Creek to Bixler Station near Brentwood. Unit bids are as follows:

	Schedule 1	Schedule 2	Schedule 3
(A) Western Pipe & Steel Co.	$4,508,532	.....	.....
(B) P. & J. Artukovich	.....	$1,902,798	.....
(C) Pacific Bridge Co.	5,122,884	2,350,521	.....
(D) Atkinson, Kier, Teichert, Bressi & Bevanda and Kettlewell	5,349,421	2,014,952	.....
(E) Pacific Pipeline, Engineers Ltd., and Haddock-Engineers, Ltd.	.....	2,069,985	.....
(F) Peter Kiewit Sons' Co.	.....	2,074,952	.....
(G) United Concrete Pipe Corp., R. A. Bell & John C. Gist	.....	2,158,212	$6,896,866
(H) Macco Construction Co.	.....	2,217,162	.....
(I) M & K Corp.	.....	2,219,784	.....
(J) American Pipe & Construction Co.	.....	2,258,960	6,879,950
(K) Morrison-Knudsen Co., Inc.	.....	2,358,885	.....

SCHEDULE 1—FURNISH STEEL PIPE

	(A)	(C)	(D)
43,552 lin. ft. furn. 68-in. x 3/8-in. pl. stl. cyl. for lining stl. pipe	17.30	18.50	21.67
80,041 lin. ft. furn. 69-in. x 3/8-in. pl. stl. cyl. for lining stl. pipe	17.45	19.00	22.14
34,855 lin. ft. furn. 68-in. x 7/16-in. pl. stl. cyl., lining stl. pipe	19.60	22.50	23.51
5,313 lin. ft. furn 69-in. x 7/16-in. pl. stl. cyl., lining stl. pipe	19.85	23.00	23.99
6,396 lin. ft. furn. 68-in. x 1/2-in. pl. stl. cyl. for lining stl. pipe	21.55	26.00	26.46
5,469 ea. const. bells on plate steel cylinder	3.00	10.00	6.49
80,584 lin. ft. line 68-in. stl. cyl with 1/2-in. cement mortar	3.00	3.00	3.24
81,120 lin. ft. line 69-in. stl. cyl. with 1/2-in. cement mortar	3.05	3.00	3.32
80,584 lin. ft. coat 68-in. lin. stl. cyl. with 3/4-in. mor. reinf. with rods	4.25	5.50	4.41
80,030 lin. ft. coat 69-in. lin. stl. cyl. with 3/4-in. mor. reinf. with rods	4.30	5.50	4.48
5,678 ea. brace pipe sections	7.00	7.00	8.39
170,157 lin. ft. del. lined stl. pipe at site of installation	1.15	1.50	1.09
80,584 lin ft. coat 68-in. lin. stl. cyl. with 3/4-in. cem. mor., mesh reinf. (alt.)	4.35	5.50	4.00
81,030 lin. ft. coat 69-in. lin. stl. cyl. with 3/4-in. cem. mor., mesh reinf. (alt.)	4.40	5.50	4.07

SCHEDULE 2—INSTALL STEEL PIPE

(1) 516,650 cu. yd. trench excav.
(2) 3,000 cu. yd. struct. excav.
(3) 350,000 cu. yd. backfill
(4) 169,275 lin. ft. inst. 67-in. and 68-in. pipe
(5) 1,400 ea. B & S jt., 67-in. pipe, w. 3/8-in. cyl.
(6) 1,120 ea. B & S jt., 67-in. pipe, w. 7/16-in. cyl.
(7) 206 ea. B & S jt., 67-in. pipe, w. 1/2-in. cyl.
(8) 2,572 ea. B & S jt., 68-in. pipe w. 3/8-in. cyl.
(9) 171 ea. B & S jt., 68-in. pipe, w. 7/16-in. cyl.
(10) 57 ea. butt-stp. jt., 67-in. w. 3/8-in. cyl.
(11) 25 ea. butt-stp. jt., 67-in. w. 7/16-in. cyl.
(12) 1 ea. butt-stp. jt., 67-in. w. 1/2-in. cyl.
(13) 110 ea. butt-stp. jt., 68-in. w. 3/8-in. cyl.
(14) 41 ea. butt-stp. jt., 68-in. w. 7/16-in. cyl.
(15) 25 ea. circum. cuts in pipe
(16) 3,447 cu. yd. reinf. conc. structs.
(17) 10 cu. yd. plain conc. structs.
(18) 6,500 bbl. furn. Portland cement
(19) 300,000 lb. furn. and pl. reinf. steel
(20) 5,000 lb. furn. and inst. struct. steel.
(21) 1,100 sq. ft. paint exp. pipe surf.
(22) 117 ea. furn. and inst. std. MH on pipe
(23) 90 ea. F & I 6-in. air vac. & relf. valve
(24) 48 ea. F & I 8-in. air vac. & relf. valve
(25) 43 ea. F & I 1-in. auto. air rel. valve
(26) 21 ea. F & I 8-in. top blowoffs
(27) 1 ea. F & I 12-in. top blowoff
(28) 3 ea. F & I 6-in. turnouts
(29) 1 ea. F & I 12-in. turnouts
(30) 1,000 lin. ft. 8-in. Cl. 250 B & S CI pipe
(31) 60 lin. ft. 12-in. Cl. 250 B & S Cl pipe
(32) 117 ea. F & I MH assemblies
(33) 110 cu. yd. conc. pave, road Xings
(34) 54 cu. yd. asph. conc. pave, rd. Xings
(35) 81 cu. yd. oil macad. pave. rd. Xings
(36) 100 cu. yd. quarry waste backfill
(37) 2 ea. plate reinf. rings

	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
(1)	.75	1.25	.78	1.10	.86	1.25	.65	.94	1.25	.75
(2)	1.00	7.50	4.95	8.00	3.00	4.00	1.60	4.00	4.00	3.05
(3)	.50	.55	.35	.45	.50	.35	.39	.65	.75	.68
(4)	2.50	1.80	2.02	1.30	1.25	2.10	1.70	1.57	1.30	1.10
(5)	83.00	130.00	112.00	98.00	125.00	120.00	170.00	125.00	110.00	171.00
(6)	83.00	160.00	127.50	118.00	133.00	125.00	200.00	135.00	125.00	171.00
(7)	100.00	190.00	142.00	216.00	140.00	150.00	240.00	145.00	140.00	180.00
(8)	83.00	130.00	116.00	98.00	127.00	122.00	170.00	125.00	115.00	172.50
(9)	83.00	160.00	130.50	122.00	134.00	127.00	205.00	135.00	130.00	175.00
(10)	185.00	250.00	233.00	172.00	287.00	210.00	440.00	250.00	195.00	300.00
(11)	185.00	300.00	261.00	230.00	336.00	220.00	510.00	300.00	210.00	315.00
(12)	200.00	500.00	290.00	390.00	370.00	300.00	590.00	330.00	225.00	400.00
(13)	190.00	250.00	233.00	182.00	289.00	212.00	450.00	250.00	210.00	313.00
(14)	190.00	300.00	268.00	288.00	338.00	222.00	525.00	300.00	225.00	333.00
(15)	30.00	60.00	85.00	104.00	80.00	50.00	44.00	37.00	100.00	35.00
(16)	80.00	45.00	56.50	83.00	61.00	38.00	46.00	65.00	50.00	60.00
(17)	60.00	40.00	56.00	66.00	57.00	35.00	16.00	62.00	25.00	40.00
(18)	2.50	2.80	3.25	4.55	2.75	3.00	3.20	4.70	3.00	4.40
(19)	.042	.11	.12	.20	.14	.10	.10	.16	.10	.11
(20)	.30	.40	.56	.60	.79	.40	.40	.55	.30	.50
(21)	.20	.50	.35	.40	1.35	.20	.25	.35	.20	.65
(22)	150.00	350.00	337.56	232.00	490.00	300.00	220.00	310.00	500.00	447.00
(23)	330.00	500.00	424.00	430.00	515.00	215.00	435.00	475.00	600.00	750.00
(24)	620.00	700.00	671.00	605.00	725.00	300.00	630.00	700.00	800.00	$1,115
(25)	40.00	60.00	85.00	63.00	57.00	80.00	40.00	42.00	80.00	108.00
(26)	300.00	600.00	494.00	435.00	575.00	350.00	630.00	700.00	690.00	$1,085
(27)	550.00	$1,000	$1,412	810.00	$1,850	500.00	$1,300	$1,200	$1,000	$2,700
(28)	200.00	400.00	777.00	372.00	415.00	300.00	$1,600	530.00	600.00	$1,085
(29)	550.00	$1,000	$1,412	815.00	$1,850	500.00	$1,300	$1,075	$1,000	$2,700
(30)	4.00	4.50	5.65	6.80	6.00	8.00	4.00	6.75	5.00	5.50
(31)	6.00	7.00	8.50	10.00	10.00	12.00	6.50	8.00	7.00	11.00
(32)	50.00	50.00	198.00	255.00	81.00	100.00	150.00	68.00	150.00	203.00
(33)	30.00	30.00	42.00	57.00	35.00	25.00	25.00	35.00	35.00	40.00
(34)	12.00	20.00	35.00	102.00	30.00	25.00	25.00	35.00	30.00	27.00
(35)	10.00	15.00	21.00	49.00	30.00	20.00	25.00	35.00	25.00	20.00
(36)	3.00	3.50	7.00	9.00	10.00	7.00	2.50	13.50	7.00	13.50
(37)	50.00	330.00	706.00	$1,420	415.00	$1,000	200.00	475.00	300.00	970.00

SCHEDULE 3—FURNISH AND INSTALL REINFORCED CONCRETE PIPE

	(G)	(J)
430 lin. ft. Cl. 67-300 pipe	26.30	27.90
1,057 lin. ft. Cl. 67-320 pipe	26.80	28.40

(Continued on next page)

BIG DITCH CO. MAINTAINS 40 MILES OF MONTANA CANAL WITH LORAIN TL-20

The Big Ditch Company of Billings, Montana, has 40 miles of canals to keep open. They also furnish water for the Highline Ditch as well as to the Snow Ditch, bringing irrigation to 40,000 acres on which the principal crops are alfalfa, sugar beets, beans, wheat, oats, barley. The picture shows their new, modern Lorain TL-20 widening the Big Ditch at highway No. 10 west of Park City, Montana, near the head gate where water is diverted from the famous Yellowstone River.

A few of the oustanding features of the new Lorain TL-20 include . . . (1) A "complete package" design which includes all necessary accessories as standard equipment (2) "Unit assembly" of each major component—clutch shaft, engine, hoist shaft, cab, crawler propelling mechanism; (3) 5 identical and interchangeable clutches on one shaft; (4) Oil enclosed cut gears; (5) Antifriction bearings; (6) Crawler, single-engine and 2-engine rubber tire mountings.

Your Thew-Lorain distributor will gladly give you full details about Lorain TL-20 and other units in the Lorain line. It will also pay you to learn about his Lorain parts and service facilities for backing up your jobs for greater profits.

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Lorain, Ohio

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LE ROI-RIX MACHINERY CO., Los Angeles 11
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BUNTING TRACTOR CO., INC., Boise, Twin Falls, Gooding, Fairfield, and Burley, Idaho; LaGrande, Oregon
CONNELLY MACHINERY COMPANY, Billings and Great Falls, Montana
SANFORD TRACTOR & EQUIPMENT CO., Reno, Nevada
THE MOUNTAIN TRACTOR CO., Missoula, Montana
THE TRACTOR & EQUIPMENT CO., Sidney, Montana
MILES CITY TRACTOR & EQUIPMENT C Miles City, Montana
P. L. CROOKS & CO., Portland 10, Orego
LEE REDMAN EQUIPMENT COMPANY, 2020 West Grant St., Phoenix, Ariz
WORTHAM MACHINERY CO., Cheyenne, Wyoming
***Branches:* Sheridan, Greybull, Caspe and Rock Springs**

9,525	lin. ft. Cl. 67-340 pipe	27.30	29.00
11,789	lin. ft. Cl. 67-360 pipe	27.70	29.60
18,731	lin. ft. Cl. 67-380 pipe	28.40	30.15
13,344	lin. ft. Cl. 67-400 pipe	28.80	30.75
14,621	lin. ft. Cl. 67-420 pipe	29.50	30.51
7,600	lin. ft. Cl. 67-440 pipe	30.00	32.30
7,139	lin. ft. Cl. 67-460 pipe	31.00	32.90
123	lin. ft. Cl. 67-480 pipe	34.00	26.75
3,383	lin. ft. Cl. 68-280 pipe	27.50	27.30
4,797	lin. ft. Cl. 68-300 pipe	27.70	27.90
8,339	lin. ft. Cl. 68-320 pipe	28.00	28.50
24,296	lin. ft. Cl. 68-340 pipe	28.50	29.00
27,532	lin. ft. Cl. 68-360 pipe	29.40	29.60
12,061	lin. ft. Cl. 68-380 pipe	30.00	30.15
4,176	lin. ft. Cl. 68-400 pipe	32.40	30.75
240	lin. ft. Cl. 68-420 pipe	35.00	60.00
60	lin. ft. 68-in. st. pipe with $\frac{7}{8}$-in. cyl.	60.00	60.00
30	lin. ft. 68-in. st. pipe with $\frac{3}{8}$-in. cyl.	50.00	55.00
169,275	lin. ft. del. pipe to site	1.70	1.20
600,500	cu. yd. trench excavation	1.00	.85
2,725	cu. yd. struct. excavation	6.00	4.00
376,500	cu. yd. backfill	.41	.60
84,330	lin. ft. inst. 67-in. R.C. pipe	3.50	3.50
84,855	lin. ft. inst. 68-in. R.C. pipe	3.65	3.50
90	lin. ft. inst. 68-in. stl. pipe	50.00	10.00
4,000	cu. yd. reinf. conc. structs	40.00	50.00
10	cu. yd. plain conc. structs.	25.00	25.00
7,200	bbl. cement	3.00	3.00
294,500	lb. reinf. steel	.10	.10
4,800	lb. struct. steel	.30	.30
1,100	sq. ft. paint pipe surf.	.30	.20
114	ea. std. MH on pipe	400.00	250.00
85	ea. 6-in. valves	300.00	400.00
5	ea. 8-in. valves	300.00	600.00
43	ea. 1-in. auto. valves	100.00	70.00
21	ea. 8-in. top blowoffs	500.00	400.00
1	ea. 12-in. top blowoff	550.00	800.00
3	ea. 6-in. turnouts	400.00	300.00
1	ea. 12-in. turnout	500.00	800.00
1,000	lin. ft. 8-in. cast iron pipe	6.00	5.00
60	lin. ft. 12-in. cast iron pipe	10.00	7.00
114	ea. MH assemblies	100.00	130.00
125	cu. yd. conc. pave, rd. Xings	30.00	35.00
60	cu. yd. AC pave, road Xings	30.00	30.00
100	cu. yd. oil mac. pave, road Xings	20.00	25.00
100	cu. yd. quarry waste backfill	10.00	7.00

California—Imperial County—City—Filtration Plant

Fred J. Early, Jr., Co., Inc., San Francisco, bid low at $165,630 before the City Council of El Centro for the construction of a water filtration plant. The plant will have an 8,000,000 gallon capacity per day. The unit bids are as follows:

(1) Fred J. Early, Jr., Co., Inc. $165,630
(2) James W. Huntley 176,716
(3) Contracting Engineers 179,650
(4) M. H. Golden Constructing Co. $182,197
(5) Hoagland & Findlay 193,619

		(1)	(2)	(3)	(4)	(5)
	Lump sum, constr. of complete water purification plant	$137,225	$153,871	$151,500	$160,900	$170,799
1,450	cu. yd. removal of silt from settling basins	2.00	2.00	4.00	2.75	2.00
4,350	sq. yd. grad. of subgrade and plac. gunite lining on bottom of settling basins	4.50	3.50	4.00	3.00	3.60
	compacted earth	15.00	10.00	10.00	10.00	10.00
460	sq. yd. restore gunite lining on settling basin sides	8.00	7.00	7.50	6.00	6.00

Arizona—Maricopa County—City—Feeder Line

Arizona Sand & Rock Co., Phoenix, submitted the low bid and was awarded the contract by the Phoenix City Council to furnish and install the 48-in. main feeder line from the reservoir to 24th St. in Phoenix. The contract price is $745,002. The unit bids were as follows:

(1) Arizona Sand & Rock Co. $745,002
(2) Vinson Construction Co. and Morrison-Knudsen, Inc. 802,093
(3) Fisher Contracting Co. 824,356
(4) Tom L. Gogo & R. A. Wattson Co. 825,996
(5) Pacific Pipeline Engineers, Ltd. & Haddock Engineers, Ltd. $855,085
(6) N. P. Van Valkenburgh 879,245
(7) Allred-Enix Construction Co. 946,169

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
9,854	lin. ft. 48-in. centrif. conc. pipe (100 ft.)	20.90	22.50	22.50	25.45	24.25	25.95	26.40
5,215	lin. ft. 48-in. centrif. CP (120 ft. head)	20.90	22.90	23.10	25.65	24.50	25.95	26.85
5,048	lin. ft. 48-in. centrif. CP (145 ft. head)	21.50	22.90	24.10	22.75	25.00	25.95	27.85
10,747	lin. ft. 48-in. centrif. steel cylinder conc. pipe (180 ft. head)	22.00	22.85	24.50	21.60	25.00	25.95	27.85
2	ea. 48-in. gate valve and vault	$6,000	$7,250	$6,350	$6,000	$5,600	$5,000	$7,283
4	ea. 36-in. gate valve and vault	$3,300	$3,970	$3,450	$3,500	$3,200	$2,800	$3,176
	Lump sum, 30-in. throttling valve and conc. vault	$8,600	$10,725	$10,750	$12,750	$9,200	$9,000	$9,772
1	ea. 16-in gate valve and box	500.00	478.70	350.00	350.00	350.00	280.00	438.85
12	ea. 12-in. gate valve and box	220.00	293.50	310.00	220.00	250.00	165.00	189.50
1	ea. 10-in. gate valve and box	180.00	239.40	212.00	200.00	200.00	125.00	157.45
26	ea. 8-in gate valve and box	120.00	160.00	145.00	150.00	100.00	110.00	109.05
4	ea. 6-in. gate valve and box	100.00	105.40	110.00	120.00	75.00	90.00	78.85
2	ea. 48-in. elbow with 24-in. branch outlet	$1,500	$1,216	$1,435	$1,150	$1,100	$1,200	$1,469
1	ea. 42-in. x 42-in. x 16-in. x 10-in. cross	$1,000	793.00	882.00	750.00	800.00	$1,000	850.00
5	ea. 48-in. x 12-in. cross	300.00	233.00	345.00	300.00	350.00	300.00	455.00
4	ea. 48-in. x 8-in. cross	260.00	215.00	336.00	300.00	300.00	300.00	348.00
4	ea. 48-in. x 12-in. tee	200.00	188.00	190.00	200.00	225.00	200.00	260.00
27	ea. 48-in. x 8-in. tee	150.00	116.75	178.00	150.00	200.00	150.00	240.00
4	ea. 48-in. x 6-in. tee	100.00	115.00	190.00	150.00	200.00	150.00	225.00
5	ea. access manhole with conc. vault	500.00	770.00	878.00	850.00	350.00	750.00	$1,300
5	ea. comb. air and vacuum relief manhole with conc. vault	800.00	$1,285	$1,250	975.00	$1,400	850.00	$1,455
1	ea. comb. air and vac. relief manhole with conc. vault	$1,200	$1,562	$1,250	$1,100	$1,425	900.00	$2,345
296	lin. ft. armoring 48-in. pipe	14.00	14.90	12.30	15.00	18.00	20.00	25.00
12	ea. armor or replace vitr. sewer crossings	100.00	28.50	21.00	35.00	40.00	50.00	50.00
1,700	sq. ft. cut and replace conc. paving	.90	.80	.80	1.00	1.50	1.50	.90
3,000	sq. ft. cut and replace asph. paving	.25	.60	.24	.20	1.35	1.25	.30
	Lump sum, const. 48-in. wye	$1,400	$1,665	$1,503	$1,400	$1,200	$1,350	$2,000
	Lump sum, furn and inst. Venturi tube and meter with conc. vault	$8,000	$9,020	$9,054	$11,500	$10,000	$9,700	$9,250
	Lump sum, furn. and inst. chlorination and access manhole with conc. vault	$1,000	916.00	$1,322	925.00	$1,100	500.00	$1,500
	Lump sum, furn. and inst. 24-in. valve, manhole, conc. vault, pipe and connections, 48th St. and Thomas Rd.	$2,500	$3,745	$4,290	$1,580	$1,700	$2,200	$2,659

(Continued on next page)

Lump sum, furn. and inst. 24-in. valve and conc. vault at 48th St. and McDowell Rd.	$1,500	$2,300	$1,715	$1,450	$1,400	$1,500	$2,459
Lump sum, furn. and inst. road block structure	100.00	230.00	185.00	160.00	200.00	100.00	250.00
Lump sum, furn. and inst. 6-in. blowoff at Crosscut Canal	170.00	570.00	463.00	375.00	300.00	250.00	250.00
Lump sum, furn. and inst. 6-in. blowoff at Grand Canal	170.00	450.00	463.00	425.00	300.00	250.00	250.00
1 ea. furn. and deliver valve oper. (portable)	$2,500	$1,600	$1,360	$1,750	$2,000	$1,500	$2,000

Tunnel . . .

Montana—Flathead County—Bur. of Reclam.—Exploration Tunnels

Gay & Amick, Butte, submitted the low bid of $10,044 on Schedule 1, and Benson, Douglas & Bissell, Coram were low at $16,926 on Schedule 2, before the Bureau of Reclamation at Kalispell for excavating two new tunnels and extending two existing tunnels at the Hungry Horse Dam Site. The work in Schedule 1 consists of performing the excavation to the same cross section as the existing tunnels. Work covered by Schedule 2 consists of enlarging the cross section of existing tunnels to a width of 6 ft. 6 in. and to a height of 8 ft. 6 in. and extending these tunnels. The unit bids submitted are as follows:

	Schedule 1	Schedule 2
(1) Gay & Amik	$10,044	$26,455
(2) A. Benson, J. Douglas & F. Bissell	10,644	16,926
(3) S. Birch & Sons Construction Co.	18,850	53,425
(4) Jayhawk Construction Co.	19,650	27,630
(5) Gibson & Roberts	21,132	26,135

SCHEDULE NO. 1—3-FT. 6-IN. X 6-FT. 6-IN. TUNNELS

	(1)	(2)	(3)	(4)	(5)
300 cu. yd. excavation, all classes, in open cut at tunnel portals	6.00	4.98	8.00	5.00	4.00
360 cu. yd. excavation, all classes, in tunnels	22.35	25.00	45.00	50.00	54.95
1 M.B.M. furnishing and erecting perm. timbering in tunnels	198.25	150.00	250.00	150.00	150.00

SCHEDULE NO. 2.—6-FT. 6-IN. X 8-FT. 6-IN. TUNNELS

450 cu. yd. excavation, all classes, in open cut of tunnel portals	6.00	4.65	8.00	5.00	4.00
215 cu. yd. excav. all classes, enlarging cross section of exist. tunnels	22.35	9.70	75.00	24.00	23.00
830 cu. yd. excav., all classes, in tunnels, except enlarging cross section of exist. tunnels	22.35	15.00	40.00	24.00	23.00
2 M.B.M. furnishing and erecting permanent timbering in tunnels	200.00	150.00	250.00	150.00	150.00

Highway and Street . . .

Oregon—Washington County—State—Surf.

Rogers Construction Co., Portland, Ore., submitted the low bid of $359,982 to the Oregon State Highway Department, Salem, for the bituminous macadam surfacing of the Wolf Creek Section of the Sunset Highway. Supplying 83,000 cu. yd. of 4-in. - 0-in. crushed rock in stockpile accounts for $182,600 of the unit bid price. The unit bids were as follows:

(A) Rogers Construction Co.	$359,982	(F) J. N. & M. J. Conley	$457,411
(B) Babler Brothers	362,020	(G) Porter W. Yett	463,752
(C) Edwin C. Gerber	434,866	(H) J. A. Terteling & Son	477,862
(D) E. C. Hall Co.	448,624	(I) McNutt Brothers	550,650
(E) Sound Construction & Engr. Co.	457,128		

(1) 83,000 cu. yd. 4-in. - 0-in. rock in base
(2) 21,000 cu. yd. 3/4-in. - 0-in. rock in base
(3) 16,000 cu. yd. plac. stockpile r. in base
(4) 24,000 yd. mi. hauling stockpiled rock
(5) 3,000 M-gal. sprinkling
(6) 7.91 mi. preparation of base
(7) 1,150 cu. yd. 3/4-in. - 0-in. rk. in binder crse.
(8) 13,300 cu. yd. furn. and place aggregates
(9) 820 ton furn. and place 121-150 asphalt
(10) 130 ton furn. and place RC-3 or emulsified asph. in seal coat
(11) 800 cu. yd. 1 1/4-in. - 3/4-in. cr. rk. in stkpile
(12) 800 cu. yd. 3/4-in. - 0-in. cr. rk. in stockpile
(13) 2,700 cu. yd. 3/4-in. - 1/2-in. cr. rk. in stkpile
(14) 3,500 cu. yd. 1/2-in. - 1/4-in. cr. rk. in stkpile
(15) 4,200 cu. yd. 1/4-in. - 0-in. cr. rk. in stkpile
(16) 1,500 lin. ft. spr. brkt. gd. rail with wd. posts
(17) 240 ea. wood sight posts
(18) 194 ton furn. & place RC-3 asph. in bdr. crse.
(19) 236 ton furn. & place RT-4 tar in bdr. crse.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	2.20	2.25	2.75	2.75	2.90	2.80	3.00	3.00	3.50
(2)	2.20	2.25	2.75	2.90	2.90	3.00	3.00	3.50	3.60
(3)	.40	.50	.75	.65	.40	.60	.25	.55	.80
(4)	.12	.15	.14	.15	.13	.11	.25	.12	.12
(5)	1.00	1.50	2.50	2.00	2.00	2.50	2.50	1.50	3.00
(6)	200.00	200.00	150.00	150.00	200.00	200.00	200.00	250.00	600.00
(7)	2.25	3.20	2.40	4.35	4.10	4.20	3.00	3.50	3.60
(8)	2.25	3.20	3.50	4.35	4.10	4.20	4.00	4.00	4.50
(9)	31.00	31.00	30.00	31.00	35.00	29.50	30.00	34.00	36.00
(10)	27.00	27.00	30.00	27.50	29.00	26.75	30.00	29.00	36.00
(11)	3.85	2.00	2.75	2.95	3.00	3.00	3.00	3.10	3.75
(12)	3.85	2.00	2.75	2.95	3.00	3.00	3.00	3.10	3.75
(13)	3.85	2.00	2.75	2.95	3.00	3.50	3.00	3.10	3.75
(14)	3.85	2.00	2.75	2.95	3.00	3.50	3.00	3.10	3.75
(15)	3.85	2.00	2.75	2.95	3.00	3.50	3.00	3.10	3.75
(16)	2.00	3.00	4.50	3.00	2.75	3.00	3.00	2.50	2.50
(17)	6.00	6.00	6.00	5.00	3.50	5.00	5.00	6.50	5.00
(18)	27.00	27.00	30.00	27.50	29.00	28.00	30.00	30.00	36.00
(19)	.....	.....	.....	.....	.....	.....	.....	.....	.....

California—Kern County—State—Pave & Concrete Bridge

Griffith Company of Los Angeles, Calif., submitted the low bid of $515,503 to the California Division of Highways, Sacramento, for the construction of 6.7 mi. of State Highway, between Cawelo and Famoso Underpass. The road is to be graded and paved with Portland cement concrete, plant-mixed surfacing is to be placed on the shoulders and a reinforced concrete bridge is to be constructed across the Poso Creek Overflow. Bids were received as follows:

(1) Griffith Company	$515,503	(4) Bowen & McLaughlin and L. G. Lynch	$627,068
(2) N. M. Ball Sons	527,012	(5) M.J.B. Construction Co.	636,634
(3) J. E. Haddock, Ltd.	595,860		

	(1)	(2)	(3)	(4)	(5)
120 cu. yd. removing concrete	3.25	4.00	5.70	10.00	8.00
170 cu. yd. removing pavement	3.25	4.00	3.60	5.00	4.00
Lump sum, clearing and grubbing	$1,800	$2,500	$2,000	$4,000	$1,000
27,000 cu. yd. roadway excavation	.36	.36	.50	.50	.70

(Continued on next page)

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SAVE TIME AND MONEY

Designed for use with high discharge type truck mixers loading directly into the hopper. No ramp is necessary.

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6 ft. 3 in. Loading Height.
8 in. Wide by 13 ft. Long.
Pneumatic Tire Wheels or Skids.

Also available is the 92 cu. ft. semi-portable hopper for use with smaller sizes of truck mixer.

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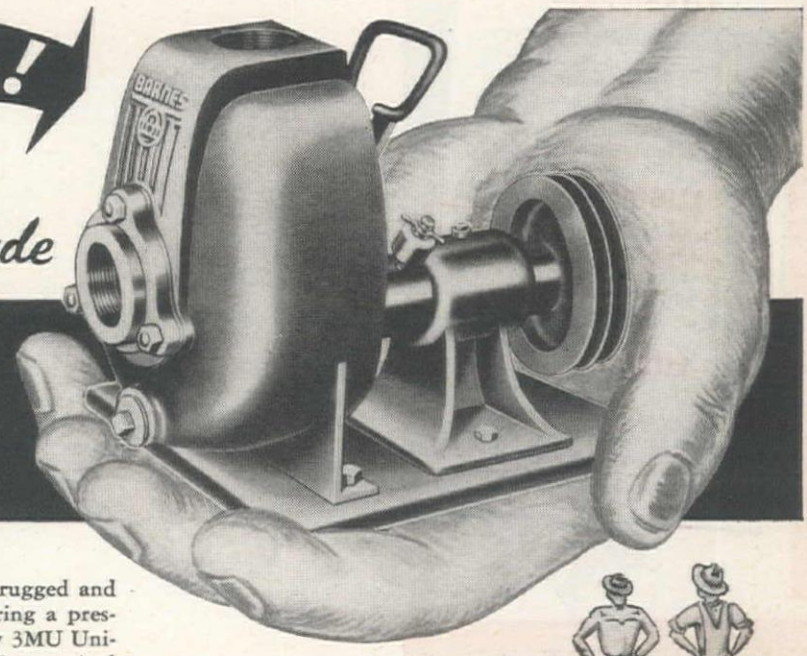

It's feather-weight and midget-sized—but as rugged and as potent as the atom when it comes to delivering a pressure-packed torrent of water—is this brand new 3MU Universal Drive 1½-inch Automatic Centrifugal Pump. And it's designed to utilize any power source—belt driven from tractor, jeep or any gasoline engine or direct shaft-coupled to electric motor.

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MANSFIELD, OHIO

69,000 sta. yd. overhaul	.01	.01	.02	.02	.02
820 cu. yd. structure excavation	2.00	2.10	1.60	1.50	2.00
110 cu. yd. structure backfill	1.75	3.00	1.50	3.00	2.00
140,000 sq. yd. compacting original ground	.03	.04	.05	.08	.05
200 cu. yd. ditch excavation	1.20	1.50	1.80	1.00	1.50
165,000 cu. yd. imported borrow	.56	.69	.67	.85	.75
93,000 sq. yd. subgrade treatment	.36	.34	.36	.43	.35
Lump sum, dev. water sup. and furn. watering equip.	$9,600	$3,500	$7,200	$2,000	$10,000
12,250 M. gals. applying water	1.20	1.65	1.25	1.75	1.70
353 sta. finishing roadway	3.50	8.00	12.00	15.00	12.00
410 tons crusher run base	3.35	3.00	4.00	4.50	4.00
9,500 tons mineral aggregate (P.M.S.)	3.45	4.20	4.80	4.50	5.50
520 tons liquid asphalt SC-4 (P.M.S.)	11.50	14.50	15.00	18.00	13.00
40 lin. ft. raised bars	1.20	1.00	1.00	1.50	2.00
58 tons liquid asphalt SC-2 (prime coat)	14.00	18.00	18.00	20.00	16.00
24 tons asphaltic emulsion (pt. bdr. & sl. ct.)	25.00	32.00	42.00	40.00	35.00
20,500 cu. yd. P.C.C. (pavement)	12.70	11.70	14.00	13.40	14.50
14,800 ea. tie bolt assemblies	.55	.50	.70	.45	.55
10 sec. pavement crossing devices (Type "C")	70.00	200.00	90.00	300.00	100.00
235 lin. ft. timber bridge railing	3.25	4.00	5.00	1.50	3.50
435 cu. yd. Class "A" P.C.C. (structures)	41.00	37.00	60.00	60.00	50.00
676 lin. ft. furnishing concrete piles	3.85	3.60	3.40	4.50	4.00
36 ea. driving concrete piles	75.00	75.00	90.00	35.00	150.00
64,000 lbs. bar reinforcing steel	.08	.085	.08	.09	.09
65 cu. yd. P.C.C. (curbs)	30.00	38.00	36.00	36.00	40.00
90 ea. curb dowels	.60	.60	1.00	.40	.60
43 ea. monuments	5.00	4.75	6.25	6.00	5.00
46 ea. culvert and monument markers	4.00	4.75	4.00	4.00	5.00
63 lin. ft. 15-in. R.C.P. (std. str.)	2.25	3.00	2.10	5.40	2.50
63 lin. ft. 24-in. R.C.P. (std. str.)	3.60	4.00	3.60	7.00	4.00
102 lin. ft. 30-in. R.C.P. (std. str.)	5.00	5.50	5.50	9.00	7.00
279 lin. ft. salvaging pipe culverts	.80	1.00	1.00	2.00	1.50
104 lin. ft. relaying salvaged C.M.P. culverts	.70	1.00	1.00	2.00	1.50
24 ea. red reflectors	1.50	3.00	2.00	4.30	3.00
Lump sum, misc. items of work	$1,250	$1,200	$1,200	$2,500	$3,000

Arizona—Pinal County—State—Grade & Surf.

Nathan A. Moore, San Gabriel, Calif., submitted the lowest bid of $344,980 to the Arizona State Highway Department, Phoenix, for 6.5 mi. of construction of the Florence-Superior Highway. The work consists of grading, draining, placing base material, road-mixed bituminous surface and Type "B" seal coat. Unit bids were as follows:

(A) Nathan A Moore $344,980
(B) Fisher Contracting Co. 350,110
(C) Wallace & Wallace 377,326
(D) Winston Bros. Company 378,579
(E) Bowen & McLaughlin & L. G. Lynch 384,916
(F) Lee Moor Contracting Co. $385,907
(G) W. R. Skousen 397,791
(H) Packard Contracting Co. 412,933
(I) H. J. Hagen 428,833

(1) 108,782 cu. yd. roadway excav. (unclass.)
(2) 4,722 cu. yd. overbreakage
(3) 4,360 cu. yd. slides
(4) 3,884 cu. yd. drainage excav. (unclass.)
(5) 17,500 lin. ft. grader ditches
(6) 5,750 lin. ft. crown ditches
(7) 1,869 cu. yd. structural excav. (unclass.)
(8) 100,556 sta. yd. overhaul
(9) 5,752 cu. yd. mi. haul
(10) 97,379 ton imported borrow
(11) 65,236 ton select material
(12) 25,825 ton aggregate base
(13) 8,575 cu. yd. stripping pits
(14) 8,231 M. gal. sprinkling
(15) 2,278 hr. rolling
(16) 352 hr. mechanical tamping
(17) 988 cu. yd. Class "A" conc. (incl. cement)
(18) 116,140 lb. reinf. steel (bars)
(19) 354 lin ft. 18-in. cor. metal pipe (CIP except excav.)
(20) 1,524 lin. ft. 24-in. cor. metal pipe (CIP except excav.)
(21) 568 lin. ft. 30-in. cor. metal pipe (CIP except excav.)
(22) 450 lin ft. 36-in. cor. metal pipe (CIP except excav.)
(23) 104 lin. ft. 42-in. cor. metal pipe (12 gauge) (CIP except excav.)
(24) 60 lin. ft. 42-in. cor. metal pipe (10 gauge) (CIP except excav.)
(25) 90 lin. ft. 48-in. cor. metal pipe (CIP except excav.)
(26) 1 ea. cattle guard (2 unit) (CIP except excavation and concrete)
(27) 2 ea. timber cattle guards for railroad
(28) 68,076 lin. ft. standard line fence
(29) 17 ea. standard wire gates (type 2)
(30) 1,820 lin. ft. reconstructing fence
(31) 400 lin. ft. rail bank protec. (type "A")
(32) 1 ea. survey monument frames and covers (Std. A-33)
(33) 240 ea. guide posts (Std. A-1 or Spec. A-1a)
(34) 105 ea. right-of-way markers (type "E")
(35) 21,310 ton mineral aggregate
(36) 1,010 ton road oil (SC-2) (for roadmix)
(37) 6.606 mi. processing roadmix
(38) 2,067 ton screenings (for seal coat)
(39) 276 ton emuls. asph. (cl. "A") (for seal coat)
(40) 1,658 sq. yd. placing intersections
(41) 49 lin. ft. stand. paved r.r. crossg. (type "B")
(42) Lump sum, railroad protec. signs (reflectorized crossbuck)
(43) Lump sum, remove and reconst. traffic island (left sta. 1079 plus)
(44) Lump sum, removal of conc. bridge (left sta. 1132 plus)

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	.58	.65	.73	.56	.78	.68	.80	.90	.90
(2)	.435	.4875	.5475	.42	.585	.51	.60	.675	.675
(3)	.29	.325	.365	.28	.39	.34	.40	.45	.45
(4)	.50	.72	.40	.60	.80	.70	.80	.60	.40
(5)	.10	.04	.06	.05	.11	.08	.05	.05	.07
(6)	.15	.12	.25	.06	.25	.25	.30	.15	.20
(7)	2.50	1.50	2.50	2.30	2.00	2.50	3.00	3.00	1.50
(8)	.02	.02	.02	.02	.02	.02	.02	.02	.03
(9)	.20	.25	.30	.25	.20	.30	.40	.30	.40
(10)	.40	.45	.35	.40	.35	.46	.50	.50	.50
(11)	.40	.48	.40	.50	.44	.53	.58	.50	.70
(12)	.85	.76	1.00	1.05	.97	1.05	.90	.90	1.10
(13)	.20	.25	.20	.25	.25	.20	.10	.20	.30
(14)	2.50	2.50	2.50	3.00	3.30	1.80	2.00	2.50	2.00
(15)	6.00	6.00	6.00	6.00	5.00	5.00	6.00	5.00	6.00
(16)	4.00	3.60	6.00	6.00	5.00	5.00	5.00	5.00	5.00
(17)	36.00	34.00	40.00	45.00	42.00	42.00	36.00	42.50	35.00
(18)	.09	.08	.10	.10	.09	.11	.11	.10	.10
(19)	2.75	2.10	4.00	3.00	2.60	2.75	3.00	3.00	3.00
(20)	4.00	3.50	4.50	4.00	3.70	4.00	4.00	4.50	4.75
(21)	5.00	4.20	5.50	5.00	4.50	5.00	5.50	6.00	5.75
(22)	7.50	6.80	7.00	7.00	7.00	7.50	6.50	7.50	8.25
(23)	8.25	8.00	8.00	8.00	8.30	8.50	8.50	11.00	9.50
(24)	9.75	10.00	9.00	10.00	10.00	10.00	9.50	12.00	11.50
(25)	11.50	9.50	11.00	9.00	10.75	10.00	10.00	13.00	11.00
(26)	450.00	500.00	500.00	700.00	450.00	400.00	550.00	400.00	400.00
(27)	500.00	200.00	350.00	400.00	400.00	400.00	250.00	300.00	200.00
(28)	.13	.15	.13	.14	.14	.14	.14	.18	.15
(29)	15.00	18.00	20.00	20.00	15.00	10.00	15.00	15.00	25.00
(30)	.10	.12	.10	.12	.13	.12	.10	.17	.10
(31)	6.50	6.00	7.00	7.00	7.50	6.00	7.00	7.50	7.00
(32)	40.00	40.00	50.00	50.00	50.00	150.00	30.00	50.00	40.00
(33)	5.00	3.90	5.00	4.00	5.00	5.50	5.00	5.00	5.00
(34)	6.00	6.30	6.00	6.00	7.00	6.50	6.00	5.00	6.00
(35)	.85	.78	1.05	1.05	.98	1.00	1.00	1.00	1.10
(36)	22.50	20.00	25.00	26.00	22.00	25.00	20.00	25.00	26.00

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OPERATORS *KNOW* IT!

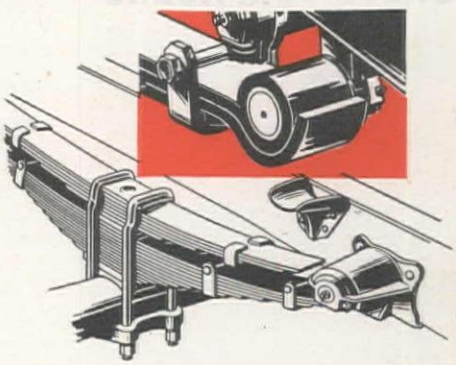
90 6 H.P.
YOUR PICK OF POWER
100 V-8 H.P.

This heavy duty 134-inch wheelbase Ford, equipped with Thornton Drive, is discharging ready-mixed concrete from its 4-cubic-yard Dumperete body, built by Maxon Construction Co., Dayton, Ohio.

"FORD TRUCKS LAST LONGER!"

ONE big reason:
FORD SPRINGS STAND UP!

Ford spring engineering provides unsurpassed endurance. Ford special alloy spring steel, with tensile strength of 200,000 pounds per square inch, assures high fatigue resistance, while deflection rates scientifically proportioned to each vehicle's gross weight assure good riding with generously ample load capacity. Long-wearing shackle bushings of steel-backed bronze reduce maintenance expense. Ford special, wrapped "safety eyes" on heavy duty front springs (illustrated) reduce stress on main leaves, afford longer life and extra safety. Hydraulic *double-acting* shock absorbers on light duty models further ease the ride and control the load.



Ford

ONLY FORD GIVES YOU ALL THESE LONG-LIFE TRUCK FEATURES: Your choice of two great engines, the 100-H.P. V-8 or the 90-H.P. Six—semi-centrifugal clutch that needs no maintenance lubrication—rear axle design that takes all weight-load off the shafts (¾-floating in half ton units, full-floating in all others)—heavy channel section frames, *doubled* between springs in heavy duty models—big, easy-action brakes, with heavy, cast drum surfaces, non-warping and score-resistant—extra-thick sheet metal in cabs, cowls, skirts and fenders—all told, more than fifty such examples of Ford endurance-engineering. That's why FORD TRUCKS LAST LONGER . . . why 7 out of 11 of all Ford Trucks built since 1928 are still in service. No wonder the average age of all Ford Trucks in use is nearly 9 years! Stamina is built into them! See your Ford Dealer NOW!

FORD TRUCKS

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE

(37)	700.00	540.00	500.00	700.00	550.00	600.00	700.00	500.00	$1,000
(38)	4.00	4.80	5.00	3.50	4.00	4.50	5.00	3.00	4.00
(39)	29.00	26.00	32.00	35.00	28.00	30.00	26.00	30.00	32.00
(40)	.75	.50	1.00	.40	1.00	.50	.50	.50	.50
(41)	4.00	5.00	5.00	4.00	6.50	7.00	10.00	1.00	10.00
(42)	250.00	300.00	120.00	350.00	330.00	225.00	500.00	20.00	150.00
(43)	400.00	$1,200	$1,200	$1,500	$1,300	800.00	$1,500	$1,000	500.00
(44)	$1,000	400.00	600.00	$1,500	$2,700	$2,000	$1,500	300.00	700.00

Irrigation . . .

Arizona—Yuma County—Bur. of Reclam.—Earthwork & Struct.

V. D. Case Co., Long Beach, Calif., was low before the Bureau of Reclamation at Yuma, Ariz., with a bid of $496,873 for the construction of earthwork, pneumatically applied mortar lining and structures for laterals from the "A" and "B" canals, and the completion of farm deliveries from the "A" canal. The work is situated southeast of Yuma. The unit bids submitted were as follows:

(1) V. D. Case Company.....$496,873
(2) Macco Construction Co..... 548,560
(3) Johnson-Western Co. $636,826

		(1)	(2)	(3)
186,300	cu. yd. excavation for laterals	.43	.70	.92
52,800	cu. yd. compacting embankments	.63	.59	.90
116,200	sq. yd. trimming foundations for mortar lining	.43	.30	.45
3,350	cu. yd. excavation for structures	1.90	3.00	4.00
5,600	cu. yd. backfill	.50	1.00	.60
2,400	cu. yd. compacting backfill	2.50	4.00	3.00
1,000	cu. yd. concrete in structures	90.75	100.00	115.00
56,750	sq. yd. pneum. applied mortar in reinf. lining	1.33	1.30	1.30
56,750	sq. yd. pneum. applied mortar in unreinf. lining	1.33	1.30	1.30
12,100	bbls. furnishing and handling cement	4.00	4.50	4.00
85,700	lbs. placing reinforcement bars	.07	.09	.10
75,000	lbs. placing reinforcement fabric	.07	.07	.12
210	sq. ft. placing elastic filler material in joints	2.00	1.00	2.00
310	lin. ft. placing rubber water stops in joints	2.00	1.50	2.00
1,750	lin. ft. placing rubber seals in joints	2.00	1.00	1.00
17	M.F.B.M. erecting timber in structures	125.00	100.00	150.00
25,500	lbs. installing gates	.30	.20	.20
9,000	lbs. installing miscellaneous metalwork	.30	.30	.30

New Mexico—Quay County—Bur. of Reclam.—Earthwork & Structs.

J. A. Terteling & Sons, Boise, Idaho, submitted bids on four schedules and Stebbins Construction Co. of Tulsa, Okla., bid on two schedules for work on the Tucumcari Project before the Bureau of Reclamation at Tucumcari. The requirements deal with the construction of structures for lateral system unit 2 and for the Conchas Canal from station 3343 plus 17 to station 3517 plus 70, and the earthwork and structures for lateral units 3 and 4. The work is located near Tucumcari. Unit bids follow:

	Schedule 1	Schedule 2	Schedule 3	Schedule 4
(1) Stebbins Construction Co.	$306,668	....	....	$78,471
(2) J. A. Terteling & Sons	275,503	$321,990	$223,867	54,398

SCHEDULE NO. 1—STRUCTURES, LATERAL SYSTEM UNIT 2

		(1)	(2)
20,000	cu. yd. excavation, common, for structures	1.90	1.25
200	cu. yd. excavation, rock, for structures	11.00	4.50
13,650	cu. yd. backfill	.60	.50
5,000	cu. yd. compacting backfill	2.00	2.50
2,000	sq. yd. dry-rock paving	6.60	5.00
2,000	cu. yd. concrete in structures	82.50	76.50
3,000	bbls. furnishing and handling cement	4.50	6.60
165,000	lbs. furn. and place reinf. bars, ¾-in. dia. and larger	.12	.12
26	M.B.M. furn. and erect timber in structures	350.00	225.00
1,950	lin. ft. laying 18-in. dia. conc. pipe	3.20	1.50
200	lin. ft. laying 21-in. dia. conc. pipe	3.20	1.75
1,825	lin. ft. laying 24-in. dia. conc. pipe	3.60	1.75
400	lin. ft. laying 30-in. dia. conc. pipe	4.00	2.00
100	lin. ft. laying 36-in. dia. conc. pipe	5.00	2.50
100	lin. ft. laying 42-in. dia. conc. pipe	6.00	3.00
600	lin. ft. laying 48-in. dia. conc. pipe	7.00	3.75
80	lin. ft. jacking 30-in. dia. conc. pipe under railroad	30.00	45.00
48	lin. ft. jacking 48-in. dia. conc. pipe under railroad	36.00	45.00
20,000	lbs. install gates and misc. metalwork	.16	.30

SCHEDULE NO. 2—EARTHWORK AND STRUCTURES FOR LATERAL UNIT 4

116,000	cu. yd. excavation, common, for canal	.40
18,500	cu. yd. excavation, rock, for canal	1.25
91,000	sta. cu. yd. overhaul	.03
36,000	cu. yd. compacting embankment	.45
12,000	cu. yd. excavation, common, for structures	1.00
100	cu. yd. excavation, rock, for structures	3.50
5,300	cu. yd. backfill	.50
5,000	cu. yd. compacting backfill	2.50
1,900	sq. yds. dry-rock paving	5.00
1,850	cu. yd. concrete in structures	76.50
2,775	bbls. furnishing and handling cement	6.60
103,000	lbs. furn. and place reinf. bars, ¾-in. dia. and larger	.12
12	sq. ft. placing elastic filler material in joints	1.00
4.3	M.B.M. furn. and erect timber in structs.	225.00
2,140	lin. ft. laying 18-in. dia. conc. pipe	1.50
316	lin. ft. laying 24-in. dia. conc. pipe	1.75
54	lin. ft. laying 30-in. dia. conc. pipe	2.00
2,020	lin. ft. laying 36-in. dia. conc. pipe	2.50
224	lin. ft. laying 42-in. dia. conc. pipe	3.00
203	lin. ft. laying 60-in. dia. conc. pipe	4.25
50	lin. ft. jacking 36-in. dia. conc. pipe under railroad	45.00
50	lin. ft. jacking 60-in. dia. conc. pipe under railroad	45.00
28,000	lbs. install gates and misc. metalwork	.30

SCHEDULE NO. 3—EARTHWORK AND STRUCTURES FOR LATERAL UNIT 3

66,000	cu. yd. excavation, common, for canal	.40
14,000	cu. yd. excavation, rock, for canal	.40
21,000	sta. cu. yd. overhaul	.03
36,000	cu. yd. compacting embankments	.40
8,000	cu. yd. excavation, common, for structures	1.25
200	cu. yd. excavation, rock, for structures	4.00
5,600	cu. yd. backfill	.50
3,500	cu. yd. compacting backfill	2.75

(Continued on next page)

40 MILES OF AQUEDUCT BY FRUEHAUF TRAILERS

A HISTORY-MAKING HAULING JOB

● ***As part of the U. S. Navy—City of San Diego project,*** the United Concrete Pipe Corporation, Los Angeles, is constructing forty miles of aqueduct between San Jacinto and San Diego. Reinforced concrete pipe is being laid. *Every section of pipe delivered to the job is hauled on a Fruehauf Trailer owned by the company.*

Sections of pipe are 16 ft. long. Diameters are 48, 54 and 72 inches. Weights range from 9 to 17 tons. The job calls for approximately 15,000 sections weighing 180,000 tons, which means thousands of trips for the Trailers.

Fifteen to twenty-nine Fruehaufs are assigned to this one project daily. Each Trailer is built to haul maximum payloads of 22 tons and remain within legal gross-weight limits. Distances from plant to dump exceed 100 miles, partly over mountainous terrain with grades up to 7 per cent.

But, this is only a small part of this company's operation. Upwards of 200 additional Fruehauf Trailers serve on other company work in California, Arizona and Nevada.

Let your nearest Fruehauf man tell you of other projects where Fruehauf Trailers are used exclusively to lighten the work of heavy hauling. A call will bring you the facts.

United Concrete Pipe Corporation fleet is 100% Fruehauf. Here is just a portion of the units assigned to the San Diego aqueduct job.

40 miles of concrete pipe in the making.

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY

Western Manufacturing Plant — Los Angeles

SALES AND SERVICE BRANCHES

LOS ANGELES, SAN FRANCISCO, PORTLAND, SEATTLE, EL PASO, PHOENIX, SAN DIEGO, FRESNO, SPOKANE, BILLINGS, SALT LAKE CITY, DENVER

FRUEHAUF TRAILERS

A TRUCK IS LIKE A HORSE — IT CAN *PULL* MORE THAN IT CAN CARRY

"Engineered Transportation"

2,200	sq. yd. dry-rock paving		5.00
1,300	cu. yd. concrete in structures		76.50
1,950	bbl. furnishing and handling cement		6.60
91,000	lb. furn. and place reinf. bars, ¾-in. diam. and larger		.12
5	M.B.M. furn. and erect timber in structs.		225.00
3,050	lin. ft. laying 18-in. dia. conc. pipe		1.50
430	lin. ft. laying 24-in. dia. conc. pipe		1.75
370	lin. ft. laying 30-in. dia. conc. pipe		2.00
960	lin. ft. laying 36-in. dia. conc. pipe		2.50
160	lin. ft. laying 42-in. dia. conc. pipe		3.00
31,000	lb. install gates and misc. metalwork		.30

SCHEDULE NO. 4—CONCHAS CANAL STATION 3343+17 TO STATION 3517+70

1,000	cu. yd. excavation, common, for canal	1.50	1.00
100	cu. yd. excavation, rock, for canal	6.80	1.00
1,000	sta. cu. yd. overhaul	.10	.03
200	cu. yd. compacting embankment	.80	.40
2,700	cu. yd. excavation, common, for structures	3.00	1.00
900	cu. yd. excavation, rock, for structures	11.00	1.00
2,300	cu. yd. backfill	.80	.50
600	cu. yd. compacting backfill	2.00	3.00
400	sq. yd. dry-rock paving	7.00	5.00
430	cu. yd. concrete in structure	97.50	76.50
645	bbl. furnishing and handling cement	4.50	6.60
45,000	lb. furn. and place reinf. bars, ¾-in. dia. and larger	.12	.12
.05	M.B.M. furn. and erect timber in structs.	600.00	225.00
230	lin. ft. laying 18-in. dia. conc. pipe	3.20	1.50
40	lin. ft. laying 48-in. dia. conc. pipe	7.00	5.00
5,100	lb. install gates and misc. metalwork	.18	.30

Bridge and Grade Separation . . .

California—Alameda County—State—Substructure

S. J. Amoroso Construction Co. of San Francisco, submitted the low bid of $387,032 to the Division of Highways, Sacramento, for the construction of a bridge substructure at Fruitvale Ave., Oakland. This is the primary work for an overhead structure over the tracks of the Southern Pacific Railroad. 4,170 cu. yd. of Class "A" P.C.C. equals practically one-third of the total cost. Unit bids are as follows:

(1) S. J. Amoroso Construction Co. $387,032
(2) Fredrickson & Watson Construction Co. and Lew Jones Construction Co. 390,641
(3) Johnson Western Co. 398,296
(4) Dan Caputo & Edward Keeble $427,799
(5) Guy F. Atkinson Co. 436,767
(6) M. & K. Corporation 439,650
(7) A. Soda & Son 500,596

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
800	cu. yd. removing concrete	6.00	3.50	4.00	4.00	7.00	10.00	3.00
Lump sum,	clearing and grubbing	$1,000	$3,500	$1,000	$1,000	500.00	$1,300	$7,500
6,850	cu. yd. roadway excavation	.70	1.25	1.25	1.00	1.35	1.80	1.70
8,200	cu. yd. structure excavation	3.50	2.65	4.00	3.25	5.25	2.20	4.00
10	cu. yd. ditch and channel excav.	3.00	2.36	5.00	3.00	4.80	9.00	10.00
5,200	ton imported borrow	1.75	1.65	1.50	3.00	1.50	2.30	2.00
15,000	sta. yd. overhaul	.01	.01	.03	.01	.01	.04	.03
Lump sum,	dev. water sup. & furn. watg. equip.	250.00	$1,700	$2,000	500.00	500.00	$1,600	$2,500
350	M. gal. applying water	2.00	2.35	1.60	2.00	2.50	2.10	2.00
Lump sum,	finishing roadway	250.00	600.00	$1,000	$1,000	600.00	750.00	750.00
2,700	tons crusher run base	2.75	3.00	3.00	4.00	3.00	3.45	3.00
4	tons asphaltic emulsion (sl. ct.)	50.00	30.00	25.00	60.00	25.00	36.00	30.00
8	ton liquid asphalt SC-1 (pr. ct.)	25.00	30.00	25.00	40.00	25.00	36.00	30.00
1,200	ton asphalt concrete leveling course	6.00	6.00	5.50	7.00	5.50	8.00	6.00
630	ton asphalt concrete Type "A" surface	6.00	6.25	5.50	8.00	5.60	8.00	6.00
4,170	cu. yd. Class "A" P.C.C. (structures)	32.00	33.00	30.00	38.00	35.00	36.00	50.00
16,000	lb. anchor bolt assemblies	.16	.20	.35	.20	.20	.25	.30
400	lbs. misc. iron and steel	.25	.35	.40	.30	.50	.50	.30
27,510	lin. ft. furn. conc. piling	2.50	2.60	3.00	2.50	2.75	2.90	2.50
917	ea. driving conc. piles	28.00	23.60	25.00	26.00	30.00	28.00	35.00
205	cu. yd. Cl. "B" P.C.C. curbs and gutters	32.00	30.00	25.00	32.00	36.00	41.00	30.00
105	cu. yd. Cl. "B" P.C.C. sidewalks	24.00	30.00	25.00	28.00	24.50	34.00	30.00
15	ea. monuments	10.00	17.00	6.00	35.00	18.00	12.00	7.00
2	ea. guide posts	15.00	7.00	6.00	5.00	6.00	12.00	10.00
65	lin. ft. rem. and reconstg. fences	1.50	1.25	2.00	3.00	2.40	4.00	2.00
40	lin. ft. 12-in. R.C.P.	2.00	2.40	2.00	2.75	2.00	3.30	2.00
36	lin. ft. 15-in. R.C.P.	2.75	2.50	2.50	3.90	4.20	5.00	3.00
530	lin. ft. 18-in. R.C.P.	3.25	3.35	3.00	4.50	3.40	5.50	4.00
490	lin. ft. 21-in. R.C.P.	5.50	4.00	3.25	5.50	4.40	6.00	5.00
300	lin. ft. 24-in. R.C.P.	5.50	4.80	3.50	6.60	4.50	7.50	6.00
100	lin. ft. 27-in. R.C.P.	7.50	5.90	4.00	7.50	7.50	9.50	9.00
1,930	lin. ft. 8-in. vitrified clay pipe	1.60	1.35	1.00	2.00	3.50	1.30	2.50
38	lin. ft. 18-in. vitrified clay pipe	5.50	4.00	3.25	7.00	6.00	5.00	4.00
20	ea. vitrified clay pipe wye branches	6.00	6.00	10.00	5.00	6.00	17.00	5.00
14	ea. brick manholes	200.00	280.00	300.00	225.00	240.00	320.00	180.00
789,000	lb. furn. bar reinforcing steel	.055	.06	.04	.06	.05	.056	.06
789,000	lb. placing bar reinforcing steel	.025	.02	.04	.02	.035	.03	.02
142	lin. ft. 12-in. steel pipe	5.00	4.50	8.00	8.00	9.50	12.00	5.00
Lump sum,	Engineer's office	$1,500	$2,300	$2,600	$3,000	$1,800	$1,200	$9,182

California—Los Angeles County—State—Undercrossing

Haddock Co. of Pasadena was low to the Division of Highways at Sacramento for the construction of a reinforced concrete undercrossing on Santa Ana Parkway at Olympic Parkway in the City of Los Angeles. The bid price was $317,090. The following unit bids were submitted:

(A) Haddock Co. $317,090
(B) E. B. Bishop 328,259
(C) Byerts & Dunn 341,062
(D) Guy F. Atkinson Co. 347,345
(E) The Contracting Engineers Co. $349,362
(F) Carlo Bongiovanni 353,773
(G) Winston Bros. Co. 369,339
(H) Vinnell Co. 383,757

(1) 17,000 cu. yd. roadway excav.
(2) 2,100 cu. yd. struc. excav.
(3) 1,200 cu. yd. struc. backfill
(4) 3,360 cu. yd. Cl. "A" P.C.C.
(5) 360 lin. ft. rubber waterstops
(6) 8,885 lin. ft. furn. steel piling
(7) 227 ea. driving piles
(8) 23 ea. steel pile splices
(9) 240 sq. yd. membrane waterproofing
(10) 290 lin. ft. 6-in. perforated metal pipe (16 ga.)
(11) 10 cu. yd. filter material
(12) 916,000 lb. furn. bar reinf. steel
(13) 916,000 lb. placing bar reinf. steel
(14) 656 lin. ft. steel railing
(15) 11,200 lb. misc. iron and steel
(16) 230 lin. ft. temp. guard railing
(17) Lump sum, lighting equip.
(18) Lump sum, misc. items of work

(1)	.40	2.15	1.00	1.05	.90	1.35	1.00	.60
(2)	2.00	2.75	1.50	2.50	2.00	2.25	2.50	1.60
(3)	2.00	2.50	2.50	3.00	2.00	2.75	3.00	2.80
(4)	59.00	50.00	54.00	59.00	61.30	60.00	60.00	75.50
(5)	4.00	2.00	3.00	3.00	3.00	3.00	3.00	3.15

(Continued on next page)

(6)	1.50	2.00	2.75	2.60	2.60	2.58	3.00	1.75
(7)	25.00	51.50	45.00	40.00	36.00	35.00	45.00	32.00
(8)	25.00	10.00	20.00	15.00	15.00	30.00	22.00	32.00
(9)	3.10	2.00	3.00	2.50	2.50	3.50	3.50	2.50
(10)	1.25	3.00	1.00	1.00	2.00	3.00	1.00	1.10
(11)	3.80	4.00	6.00	6.00	5.00	5.00	4.00	6.00
(12)	.05	.045	.05	.05	.055	.07	.06	.05
(13)	.027	.03	.03	.03	.02	.01	.035	.03
(14)	5.45	6.50	5.25	6.00	6.00	5.35	8.00	5.75
(15)	.28	.40	.25	.35	.40	.30	.35	.40
(16)	3.50	3.00	3.00	1.50	5.00	2.80	2.50	1.80
(17)	$2,240	$3,000	$3,000	$4,868	$2,500	$1,500	$3,500	$3,100
(18)	$3,000	$2,000	$16,000	$1,500	$6,800	$4,507	$2,000	$2,450

Oregon—Douglas County—State—Concrete

Sleeper & Keyes, Bend, submitted the low bid of $65,770 to the Oregon State Highway Commission at Salem for the construction of two Class A concrete bridges on the Johns-Glendale Junction section of the Pacific Highway. All unit bids submitted follow:

(1) Sleeper & Keyes.....$65,770
(2) Lockyear & White..... 92,880
(3) R. A. Heintz Construction Co.....$97,000

	(1)	(2)	(3)
All required shoring, cribbing, etc.	$2,000	$10,000	$8,000
600 cu. yd. structural excavation	5.00	10.00	15.00
50 cu. yd. struct. excav. below elev. shown	5.00	10.00	15.00
800 cu. yd. Class A concrete	50.00	65.00	63.00
158,000 lb. metal reinforcement	.09	.11	.125
700 lin. ft. metal handrail	9.00	10.00	13.00

Waterway Improvement . . .

California—Monterey County—U. S. Engineers—Jetty Protection

Granite Construction Co., Watsonville, submitted the low bid of $286,883 to the U. S. Engineer Office in San Francisco for the construction of jetty protective work at Moss Landing Harbor, Monterey Bay. Bids were received as follows:

(1) Granite Construction Co. $286,883
(2) Healy-Tibbitts Construction Co. 316,350
(3) Johnson Western Co. 339,903
(4) Guy F. Atkinson Co. $384,645
(5) Piombo Bros. & Co. 392,450

	(1)	(2)	(3)	(4)	(5)
Lump sum, mobilization and demobilization	$19,073	$35,000	$30,000	$28,355	$40,000
10,000 cu. yd. excav	.40	.50	1.00	1.20	1.00
19,000 tons C stone	4.80	4.25	4.78	4.60	4.50
8,100 tons B stone	5.30	5.25	4.93	5.00	5.50
15,000 tons A stone	5.30	6.50	5.13	5.20	6.00
1,600 tons A-1 stone	5.30	6.50	5.50	5.70	7.00
1,390 lin. ft. trestle constr.	30.00	32.50	60.00	93.00	80.00

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...

Olson Construction Co. of Salt Lake City, Utah, received the $3,406,000 contract from the U. S. Engineer Office, Washington, D. C., for the constr. of a veterans administration hospital at Grand Junction, Colorado.

Nettleton & Baldwin of Seattle, Wash., have a $4,500,000 contract, awarded by the Lake Burien Heights Holding Corp. of Seattle, for the construction of 544 apartments on Ambaum Way, Seattle.

Western Pipe & Steel Co., San Francisco, Calif., received $4,508,532 from the East Bay Municipal Utilities District, Oakland, to furnish pipe for the Second Mokelumne Aqueduct, Unit B, betw. Walnut Creek and Brentwood, Calif.

Consolidated Steel Corp. of Portland, Ore., has a $2,500,000 contract from the El Paso Natural Gas Co., El Paso, Tex., for the fabrication of 100 mi. of 26-in. steel pipe, part of gas pipe line to be laid from Texas to California.

McKeon Construction Co., San Francisco, was awarded a $5,000,000 contract by the San Jose Development Co., for the construction of 600 residences in San Jose, Calif.

Carbon Bros. of Spokane, Wash., received $409,880 from the Department of Highways at Olympia for highway construction from Jared to Blueslide on P. State Hwy. 6, Wash.

Fluor Corp., Ltd., Los Angeles, Calif., received a contract from American Potash & Chemical Co., for the construction of chemical processing plant near Searles Lake, Calif. Total estimated cost is $4,000,000.

Otto B. Ashbach & Sons, St. Paul, Minn., was awarded a $697,724 contract by the Bureau of Reclamation, Coachella, Calif., on Schedule 1, for canal lining, Coachella Canal, All-American Canal System, near Indio, Calif.

Stolte, Inc., 8451 San Leandro St., Oakland, and **Morrison-Knudsen Co., Inc.**, Crocker First National Bank Bldg., San Francisco, Calif., have a $3,000,000 supplemental contract for constr. of a 150-bed hospital in Fairfield, Calif. U. S. Engineer Office, Sacramento, awarded the contract.

Quoidbach Construction Co. of Longview, Wash., will build a plywood mfg. plant in Longview for Weyerhaeuser Timber Co. The contract price is $1,000,000.

Guy F. Atkinson Co., Los Angeles, has a $797,800 contract from the Department of Water & Power, Los Angeles, for construction of main bldg. substructure, Units 3, 4 and 5, Harbor steam plant, Wilmington, Calif.

Archie Iverson & Co., Seattle, Wash., is building 100 duplex dwellings in Seattle at $1,300,000 for self.

Johnson Western Co. of San Francisco, received $1,200,000 for miscellaneous construction and dredging at the harbor at Malibu, Calif. The contract was let by Malibu Quarterdeck Improvement Co., Beverly Hills.

P. J. Walker Co., of Los Angeles, Calif., has a $2,000,000 contract from the Southern California Telephone Co., Los Angeles, for the construction of an addition to telephone bldg. in Huntington Park, Calif.

Welded Steel Cages Tie-in Columns and Roof

WELDED steel cages are used for tie-in between tubular columns and the reinforcing structure of a roof in a building addition erected in Cleveland, Ohio. Architects: Cutting & Ciresi.

The reinforced concrete structure is 60′ x 182′ with a wing 105′ wide. So that another floor may be added later, the roof is heavily reinforced to take 400 lbs. per sq. inch.

Details of the welded steel cage and the top of the tubular column are sketched in Fig. 1. The cages are made of ¾″ round reinforcing bars, formed into rectangles and butt

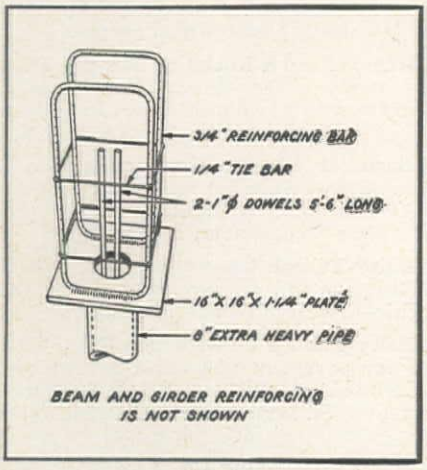


FIG. 1

welded. These rectangles are tied together with ¼″ tie rods, tack welded to the bars.

Fig. 2 shows how the steel cages are welded, on both sides of each leg, to the top plate of each column by a 4″ fillet weld using 5/16″ "Fleetweld 5" electrode.

The tubular columns are 8″ diameter, extra-heavy pipe. Plates measuring 16″ x 16″ x 1¼″ are shop-welded to the column ends with a ¼″ fillet all around.

The building has ten columns 17′-10″ long and two which are 21′-8″ long.

Fig. 3 shows one column and steel cage, and the framework used to support forms for concrete girders,

FIG. 2

beams and floor slabs.

Fig. 4 shows roof during a later stage of construction with reinforcing bars for girders and beams in place, ready for placing of concrete.

The reinforced concrete girders are 28″ deep and are haunched down at the columns. Reinforcing bars in girders are 1⅛″ square and those in the beams are 1″ round. Strap iron frame shown in center of picture will have anchor bolts through the four holes for future second-floor column.

The Lincoln Electric Company for years has been publishing a series of Studies in Structural Arc Welding. These may be obtained by writing to THE LINCOLN ELECTRIC COMPANY, Dept. 281, Cleveland 1, Ohio.

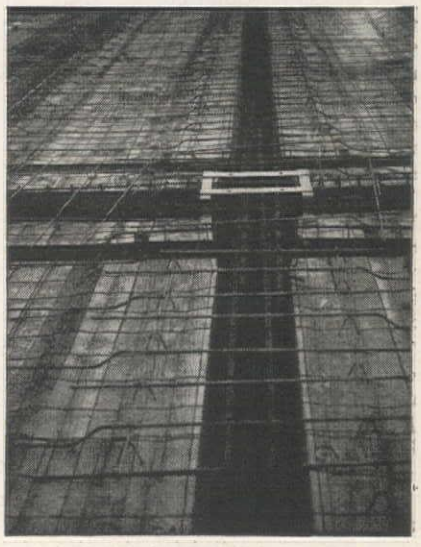
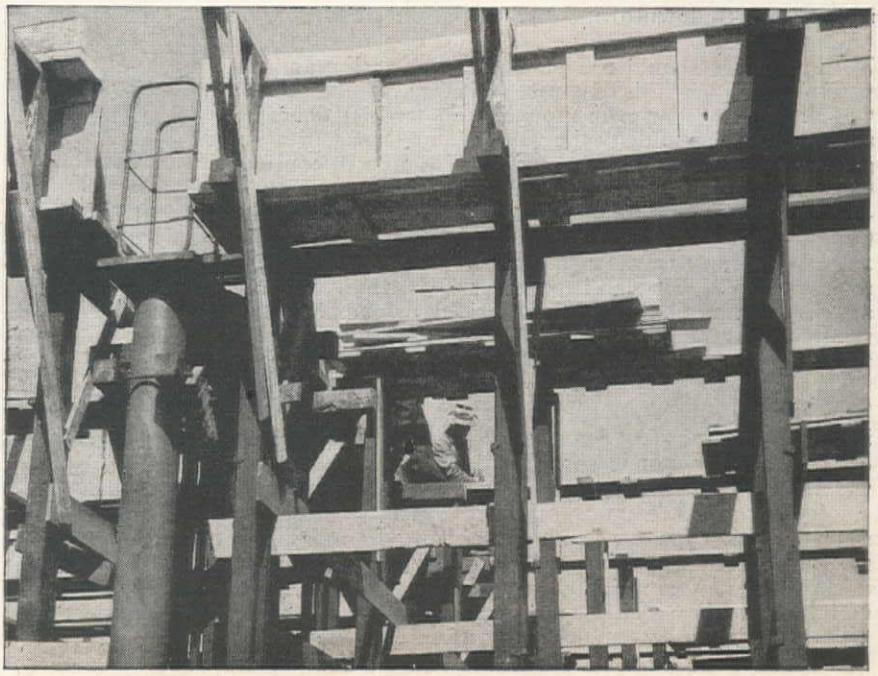


FIG. 4

FIG. 3



Bay Crossing Report a Fiasco

THE JOINT ARMY AND NAVY Board established to hear proposals and make recommendations to the Secretaries of War and Navy regarding a second traffic crossing of San Francisco Bay has after many months and apparently with much reluctance, made public its report.

The regular editorial page of this issue of *Western Construction News* had already been printed when the report became public property but the editors have found that it is possible to hold the presses long enough to insert a special editorial in this location, and are expressing here certain thoughts brought to mind by reading the first newspaper statements regarding the report.

It is a fortunate thing that there is nothing final about the report. There is no authority vested in this board which gives it the power to positively establish either the location or type of the very-much-needed second crossing. It is fortunate because the crossing it suggests is one of the least satisfactory possible. The board was authorized only to hear the many proposals which have been suggested from time to time, and indicate which it felt most suitable from a military standpoint. They were not to make an engineering study, and have made their determination purely on the military basis, utterly disregarding the general public interest and convenience.

The proposal the board has adopted is a "roller-coaster" hodge-podge of engineering design. Beginning at Army Street in San Francisco, far south of the population and business concentrations which the structure should be designed to serve, it passes over a 3,600-ft. trestle, then dips into a tube with maximum depth of 81 ft. below sea level for 6,400 ft. Emerging from this it again goes onto a trestle for about 6 mi. to Alameda Island. This it crosses by a freeway and then ducks underground again to go under Alameda Estuary, rising near downtown Oakland.

The Reber plan, which seems to be the most satisfactory all-around solution to the Bay problem, was junked early by the board. So was the idea of a second bridge near the present structure, as currently being studied by the State Division of Highways. Either of these plans would join the two main centers of population, the primary requisite.

The Board is quoted as mentioning a number of deciding factors. Their conclusions are to say the least subject to considerable debate. Among them are:

1. It is less vulnerable in time of war; of the tube sections this is no doubt true, but since the major part of the crossing is on trestle, it is obviously just as vulnerable as any other bridge. The Reber plan, of course, provides real invulnerability.

2. It provides relief for the city of Alameda; this it does for a very, very small percentage of Alameda citizens who wish to reach the southern portion of San Francisco. Those wishing to go to downtown San Francisco are no better off than at present.

3. Commuters should use public transportation and not drive to their work; this of course is a stupid hiding of their heads in the sand, for even though the board members are such old fogeys as to deny the value of auto transportation, it is nevertheless a fact, and actual conditions will continue to leave their opinions behind.

4. It is the only acceptable solution which could provide ultimate railroad entrance to San Francisco, the only major U. S. city without transcontinental rail service; obviously untrue, for the Reber plan is particularly well suited to that purpose, and any of the low level bridge or complete tube proposals could be similarly adapted. Incidentally, costs would be tremendously increased over the anticipated $261,000,000 for the "roller-coaster" without rails.

The board deliberately disregards public interest by admitting that a second "central crossing" would have far more "tangible economic considerations." It blithely overlooks the many collateral advantages of the Reber plan, including ease and economy of construction, expansion of harbor facilities for Oakland and Alameda, creation of stable-level fresh water lakes, addition of multiplied thousands of acres of new industrial, residential and farming land in the Eastbay region, and many others.

As we said in the beginning, it is fortunate indeed that the board's authority is not final!

D. V. Davidson Co., Tacoma, Wash., has a $4,000,000 contract from the Corliss Investment Co. of Tacoma for the constr. of 513 dwellings in West Moorland Addition, Tacoma, Wash.

Guy F. Atkinson Co., San Francisco, was awarded a $1,096,600 contract by the California Division of Highways at Sacramento for 10.2 miles of highway and bridge construction between Keene and Tehachapi in Kern Co., Calif.

Hykes Construction Co., Seattle, Wash., has a $1,000,000 contract from Carroll, Hillman & Hedlund; Inc., for the constr. of apartment bldgs. in Oneida Gardens, Sand Point District, Tacoma, Wash.

P. & J. Artukovich, Los Angeles, Calif., will install pipe betw. Walnut Creek and Brentwood on construction of Second Mokelumne Aqueduct, Unit B. The $1,952,798 contract was awarded by East Bay Municipal Utilities District, Oakland.

Reimers & Jolivette of Portland, Ore., have a contract for $750,000 to remodel a 7-story office building in Portland, Ore. Lincoln Building of Portland awarded the contract.

Howard S. Wright & Co., Seattle, Wash., received a contract from the Seattle Post-Intelligencer, for the construction of a 2-story newspaper plant in Seattle, Wash. The amount of the contract is $900,000.

Highway and Street . . .

Arizona

COCHISE CO.—**R. H. Martin,** Box 934, Tucson—$197,291 for 10.3 mi. grade, drain, base and bitum. surf. treatment on Douglas-Safford Hwy., from 3½ mi. E. of Pearce extending NW.—by State Highway Department, Phoenix. 1-2

COCHISE CO.—**W. R. Skousen,** 548 N. Grand, Mesa—$79,555 for 1.5 mi. grade, drain, base material and road mix. bitum surf. of Tucson-Benson Hwy., from one mi. W. of Benson extending W.—by State Highway Department, Phoenix. 1-2

MARICOPA CO.—**Arizona Sand & Rock Co.,** Box 596, Phoenix—$22,994 to improve portions of Sheridan St., 21st St. and 22nd St., Phoenix—by Directors of Avalon Annex Improvement District, Phoenix. 1-1

MARICOPA CO.—**Bartol & Shearer Contracting Co.,** 135 South 7th St., Phoenix—$188,468 for 5.6 mi. grade, drain, base and surf. on Central Ave., from N. city limits to Arizona Canal Phoenix—by State Highway Department, Phoenix. 1-

MARICOPA CO.—**Daley-Tulloch Construction Co.,** 2400 16th St., Phoenix—$15,997 to pave and improve Sheridan St., betw 3rd and 7th Sts., Phoenix—by City Council, Phoenix. 1-1

MARICOPA CO.—**Daley-Tulloch Construction Co.,** 2400 16th St., Phoenix—$15,767 for pavement and improvement of Mt Vernon Ave., betw. Carlton Ave. and Indian Rd., Phoenix—by Directors of Mt. Vernon-6th St. Improvement District, Phoenix 1-1

MARICOPA CO.—**Fisher Contracting Co.,** Box 4035, Phoeni —$184,532 to improve 15th Ave., Edgemont Ave., Thomas Rd Verde Lane, Catalica and Avalon Dr., 8th, 9th, 11th and 13t Aves., Phoenix—by City Council, Phoenix. 1-

MARICOPA CO.—**Tiffany Construction Co.,** Box 846, Phoeni —$67,816 for grade, drain, base and surf. on U. S. Rt. 80, fro Lateral 15 to Lateral 14 — by State Highway Departmen Phoenix. 1-2

PINAL CO.—**J. E. Skousen,** 243 W. 1st Ave., Mesa—$300,20 for 3.5 mi. grade, drain, base and road mix bitum. surf. of Flo ence-Superior Hwy., 6½ mi. E. of Florence and extending E.— by State Highway Department, Phoenix. 1-

California

KERN CO.—**Basich Bros. Construction Co.,** & **Basich Bros** Box 151, Alhambra—$143,373 for 5 mi. grade and surf., fro approx. 12 mi. E. of Mojave to Muroc Junction—by Divisio of Highways, Sacramento. 1-3

LOS ANGELES CO.—**A. A. Edmondson,** 1021 Grandview Ave Glendale—$54,528 for .8 mi. grade and plantmix surf. on cemer treated base, ½ mi. N. of Palmdale—by Division of Highway Sacramento. 1-

LOS ANGELES CO.—**Spicer Co.,** Box 8383 W. Adams Sta tion, Los Angeles—$39,903 to grade, pave and improve Wi Rogers State Park Rd., betw. 3,000 ft. N. of Sunset Blvd. an Sunset Blvd., Los Angeles—by County Board of Public Work Los Angeles. 1-

ORANGE CO.—**Cox Bros. Construction Co.,** Box 36, Stanton—$106,362 to grade and pave .9 mi. hwy. betw. Doheny Park and San Juan Creek—by Division of Highways, Sacramento. 1-10

ORANGE CO.—**Griffith Co.,** 1060 South Broadway, Los Angeles—$241,258 for 11.2 mi. widening and applying surf. treatment on Harbor Blvd., betw. Wilson St., Costa Mesa and Manchester Ave. south of Anaheim—by Division of Highways, Sacramento. 1-2

SACRAMENTO CO.—**J. R. Reeves,** Box 1072, Sacramento — $131,304 to improve various sts. in Sacramento—by City Council, Sacramento. 1-2

SACRAMENTO CO. — **A. Teichert & Son, Inc.,** Box 1133, Sacramento—$30,670 to improve various sts. in Sacramento—by City Council, Sacramento. 1-2

SAN MATEO CO.—**Edward Keeble & F. H. Brown,** Box 669, San Mateo—$122,653 to grade, pave and improve sts. in Dore and Cavanaugh Subdivision, San Mateo—by City Council, San Mateo. 1-22

SAN MATEO CO.—**L. C. Smith,** First and Railroad Aves., San Mateo—$146,203 to grade and pave Redwood Terrace No. 1 and adjacent territory, Redwood City—by City Council, Redwood City. 1-22

TUOLUMNE CO. — **Beerman & Jones,** Sonora—$74,716 for .4 mi. grade and plant-mix surf. of Stockton St., betw. Solinsky and Washington Sts., Sonora—by Sequoia Hospital District, Sacramento. 1-28

VENTURA CO. — **Ted F. Baun,** 324 Princeton, Fresno—$35,287 to grade and surf. Central Ave., betw. Vineyard Ave. and Ditch Rd., and Santa Clara Ave. and U. S. Hwy. 101—by County Board of Supervisors, Ventura. 1-17

VENTURA CO. — **Ted F. Baun,** 324 Princeton, Fresno—$12,287 to improve 1.5 mi. of Grand Ave. in Rancho Sespe area—by County Board of Supervisors, Ventura. 1-17

Idaho

GOODING CO. — **Barnhart & Wheeler,** 310 Monroe Ave., Pocatello—$106,390 for 9.1 mi. crushed gravel surf. and cover coat material on North Side Hwy., betw. Malad River and Wendell—by Bureau of Highways, Boise. 1-4

GOODING CO. — **Barnhart & Wheeler,** 310 Monroe Ave., Pocatello—$45,065 for 6.4 mi. crushed gravel surf. and cover coat material on North Side Hwy., betw. Bliss and Malad River—by Bureau of Highways, Boise. 1-4

LATAH CO.—**Axel Osberg,** 1132 N. 128, Seattle, Wash.—$218,226 for 2.9 mi. hwy. constr. of Brady Gulch section of Kendrick-Troy area—by Bureau of Highways, Boise. 1-21

Nevada

ORMSBY CO. — **Nevada Constructors, Inc.,** 646 St. Lawrence St., Reno—$69,816 for constr. of hwy. from Curry St., Carson City, to King's Canyon Creek on Rt. 683—by Department of Highways, Carson City. 1-17

WHITE PINE CO. — **Hoopes Construction Co.,** Box 431, Twin Falls, Idaho—$189,369 for 9.3 mi. excavation, base and surf. from Sacramento Pass to Baker Junction, Rt. 14, Section B—by Department of Highways, Carson City. 1-3

New Mexico

BERNALILLO CO.—**Wylie Bros.,** Albuquerque—$25,696 for 1.4 mi. grade, drain structs., watering, rolling, etc., of State Hwy. 269, 45, and U. S. Hwy. 85, near Pajarito—by State Highway Department, Santa Fe. 1-17

CURRY CO.—**Jones Bros.,** Albuquerque—$50,838 for 3.5 mi. grade, ballast, surf., and seal coat on State Hwy. 270, in Clovis—by State Highway Department, Santa Fe. 1-17

OTERO CO.—**Thygesen & Llewellyn,** Box 876, Albuquerque—$138,834 for 3.4 mi. grade, drain structs., watering, rolling, etc., of State Hwy. 83, betw. Alamogordo and Cloudcroft—by State Highway Department, Santa Fe. 1-17

SANTA FE CO.—**Walter L. Denison,** 207 S. Hermosa St., Albuquerque—$274,312 for 3.9 mi. of grade, drain structs., surf., etc., of U. S. Hwy. 85, betw. Albuquerque and Santa Fe—by State Highway Department, Santa Fe. 1-3

Oregon

MORROW CO.—**J. S. Risley,** Milwaukie—$192,309 for 3.6 mi. grade, surf. and oil of Hardman Hill section, and surf. and oil of Rhea Creek-Hardman Hill section of Heppner-Spray Hwy.—by State Highway Commission, Salem. 1-11

UMATILLA CO.—**O. C. Yocom,** 902 S.E. 11th St., McMinnville—$141,478 for 5.4 mi. surf. and oil of McNary dam-Hermiston section of Old Oregon Trail—by State Highway Commission, Salem. 1-11

Texas

COLLIN CO.—**L. H. Lacy & Co.,** Box 5726, Dallas—$120,053 for 7.1 mi. grade, drain structs., base and surf. from State Hwy. 78 to Josephine—by State Highway Department, Austin. 12-30

COOKE CO.—**L. P. Reed,** Box 425, Meridian—$194,377 for 11.3 mi. grade and structs., from Gainesville to Denton Co. line—by State Highway Department, Austin. 12-30

LUBBOCK CO.—**Thomas & Ratliff,** Rogers—$102,396 for 15.3 mi. grade, structs., base and surf., from Hockley Co. line to Slide

and from U. S. Hwy. 87 - E.—by State Highway Department, Austin. 12-30

NUECES CO.—**Heldenfels Bros.**, Rockport—$461,083 for 11.7 mi. grade, struct., base and surf. from Driscoll to Kleberg Co. line—by State Highway Department, Austin. 1-8

SOMERVELL CO.—**J. W. Perry**, Insurance Bldg., San Antonio—$49,448 for 5.8 mi. grade, drain structs., base and surf. near Rock Creek School—by State Highway Department, Austin. 1-3

Washington

BENTON CO.—**C. E. O'Neal**, Box 268, Ellensburg—$71,459 for 11.7 mi. hwy. constr. on P. State Hwy. 3, from Richland Rd. Junction to Kiona—by Department of Highways, Olympia. 1-29

CLALLAM AND JEFFERSON COS.—**N. Fiorito, Inc.**, 844 W. 48th St., Seattle—$194,661 for 3.7 mi. clear, grub, grade and surf. of P. State Hwy. 9, near Contractor's Gulch—by Department of Highways, Olympia. 1-8

KING CO.—**N. Fiorito, Inc.**, 844 W. 48th St., Seattle—$302,740 for 3.9 mi. clear, grub, grade, surf. and constr. conc. piers and abutments for railway bridge on S. State Hwy. 2-A from Kennydale to Bellevue—by Department of Highways, Olympia. 1-22

KITSAP CO.—**Axel Peusa**, 5245 S. State St., Tacoma—$44,494 for .6 mi. grade, drain, surf., constr. riprap and remove trestle on Brownsville-Gilbertson Rd. — by County Board of Commissioners, Port Orchard. 1-22

KITTITAS CO.—**Harrison Bros. Co.**, 225 Wakefield Dr., Tacoma—$146,807 for 5.5 mi. widening, clearing, grub, grade and surf. of P. State Hwy. 7, Ellensburg to junction S. State Hwy. 7-B—by Department of Highways, Olympia. 1-22

OKANOGAN CO.—**M. E. Nelson Construction Co., Inc.**, Box 458, Ephrata—$47,521 for 3.7 mi. clear, grub, base and surf. of Conconully Rd.—by Department of Highways, Olympia. 1-30

PEND ORIELLE CO.—**Carbon Bros.**, Box 5025, Sta. C, Spokane—$49,880 for .6 mi. clear, grub, grade, ballast and surf. of P. State Hwy. 6, Jared to Blueslide at Granite Point—by Department of Highways, Olympia. 1-22

SNOHOMISH CO.—**M. P. & W. J. Halleran**, 2342 N. Broadway, Seattle—$82,893 for 3.6 mi. unclass. excav., place borrow and surf. of Woods Creek-Lake Roesiger Rd.—by Department of Highways, Olympia. 1-30

YAKIMA CO.—**Rumsey & Co.**, 3821 Airport Way, Seattle—$214,848 for .09 mi. clear, grub, excav., base course and surf. of Yakima Co. Rd. and P. State Hwy. 3, Selah Rd. connection—by Department of Highways, Olympia. 1-30

Bridge & Grade Separation...

California

KERN CO.—**Guy F. Atkinson Co.**, Orange & Railroad Aves., South San Francisco—$1,096,600 for 10.2 mi. grade and surf. and constr. of one conc. bridge and substruct. for 4 bridges, betw. Keene and Tehachapi—by Division of Highways, Sacramento. 1-2

LOS ANGELES CO.—**Angelus Waterproofing & Paint Co.**, 4829 York Blvd., Los Angeles—$12,720 to apply protective coat to steel bridge across Ballona Creek, south of Santa Monica—by Division of Highways, Sacramento. 1-3

LOS ANGELES CO.—**J. E. Haddock, Ltd.**, 3538 E. Foothill Blvd., Pasadena—$317,090 for constr. of reinf. conc. undercrossing on Santa Ana Parkway at Olympic Parkway, Los Angeles—by Division of Highways, Sacramento. 1-10

LOS ANGELES CO.—**J. E. Haddock Ltd.**, 3538 E. Foothill Blvd., Pasadena—$259,144 for constr. of reinf. conc. box girder overcrossing and reinf. conc. box girder undercrossing, Santa Ana Parkway at Esperanza St. and Indiana St., Los Angeles—by Division of Highways, Sacramento. 1-2

LOS ANGELES CO.—**Winston Bros.**, 411 W. 5th St., Los Angeles—$485,769 for constr. of reinf. conc. box girder overcrossing, Arroyo Seco Parkway at Sunset Blvd., Los Angeles—by Division of Highways, Sacramento. 1-31

SANTA CLARA CO.—**Dan Caputo & Edward Keeble**, 985 Deimas Ave., San Jose—$58,785 to widen bridge and .4 mi. grade and pave on Stevens Creek Rd., betw. Orange Ave. and Stevens Creek—by Division of Highways, Sacramento. 1-6

SISKIYOU CO.—**Reed & Tuttle**, Redwood Valley—$33,335 for constr. of .07 mi. of Salmon River and Nordheimer Creek bridges—by Public Roads Administration, San Francisco. 1-29

Water Supply . . .

Arizona

COCONINO CO.—**N. P. Van Valkenberg,** 8609 San Vicente, South Gate, Calif.—$275,000 for constr. of water treatment plant additions, Williams—by City Council, Williams. 1-24

MARICOPA CO.—**Allison Steel Co.,** Phoenix—$72,000 to install steel reservoir roof for 20,000,000 gal. reservoir near Scottsdale—by City Council, Phoenix. 1-14

MARICOPA CO.—**Arizona Concrete Pipe Co.,** 1746 W. Fillmore, Phoenix—$16,453 to furnish and install pipe for new water wells, Phoenix—by City Council, Phoenix. 1-10

California

ALAMEDA CO.—**Pacific Pipe Line Construction Co., Engineers, Ltd., & R. V. Wilson,** 2128 San Pablo Ave., El Cerrito—$41,890 to install approx. 5860 lin. ft. welded steel water main in Mountain Blvd., betw. Upper San Leandro Filter Plant and Oak Knoll Blvd., Oakland—by East Bay Municipal Utility District, Oakland. 1-14

CONTRA COSTA CO.—**P. & J. Artukovich,** 13305 S. San Pedro St., Los Angeles—$1,952,798 to install pipe betw. Geary Rd. in Walnut Creek and Bixler Station, near Brentwood on constr. of Second Mokelumne Aqueduct, Unit B—by East Bay Municipal Utility District, Oakland. 12-27

LOS ANGELES CO.—**Paddock Engineering Co.,** 9060 Santa Monica Blvd., Los Angeles—$14,500 for constr. of 300,000 gal. conc. water tank, Malibu Ranch, near Roosevelt Hwy. — by Malibu Water Co., Malibu. 12-27

SAN DIEGO CO.—**V. R. Dennis Construction Co.,** Mission Gorge Rd., San Diego—$19,350 to install fire protection system at Edgemoor Farm, Santee—by County Board of Supervisors, San Diego. 1-10

SAN FRANCISCO CO.—**San Francisco Water Department,** 425 Mason St., San Francisco—$6,659 to install 4-in. and 8-in. water mains in Chestnut, Hyde, Hanover Sts. and Rockridge Dr., San Francisco—by City and County, Public Utilities Commission, San Francisco. 1-8

Colorado

BOULDER CO. — **Louis Pinello,** Rt. 1, Box 82, Colorado Springs—$121,000 to install approx. 19,830 lin. ft. welded steel pipe, betw. Longmont Diversion Dam and Longmont hydroelectric plant — by City Council, Longmont. 1-28

Texas

DALLAS CO. — **Diamond Engineering Co.,** Buckner Blvd. and New Kaufman Rd., Dallas—$37,893 for relocation of water main in Central Ave., Dallas—by City Council, Dallas. 1-3

SCURRY CO.—**Clovis Contracting Co.,** Clovis, N. Mex.—$26,474 to constr. conc. reservoir, pump house and facilities, Snyder —by City Council, Snyder. 1-21

Utah

SEVIER CO.—**W. E. Thatcher,** 17th and Jackson, Ogden — $27,000 for constr. of 1,000,000-gal. capacity, reinf. conc. reservoir and pipe installation, Richfield — by City Council, Richfield. 1-2

Sewerage . . .

California

ALAMEDA CO.—**Gallagher & Burk,** 900 73rd Ave., Oakland — $12,264 to install standard culverts in Alameda — by City Council, Alameda. 1-9

ALAMEDA CO.—**A. J. Hopper Co.,** 243 Langton St., San Francisco—$53,290 to install 54-in. and 48-in. reinf. conc. pipe storm sewer in Ellis, Russell and Grant Sts. from Woolsey to Oregon St., Berkeley—by City Council, Berkeley. 1-8

KERN CO.—**Pipeline Constructors,** Box 97, Bakersfield—$64,081 to install vit. clay pipe sewer lines, wyes, and manholes in Oildale — by North of River Sanitation District No. 1, Oildale. 1-28

LOS ANGELES CO.—**Bebek & Brkich,** 238 W. Florence Ave., Los Angeles—$46,006 to install sewers, house connect., wye branches, manholes, etc., Maple and other sts., Pasadena—by City Council, Pasadena. 1-10

LOS ANGELES CO.—**Burch & Bebek,** 2803 Los Flores Blvd., Lynwood—$62,425 to install sewers in new subdivision, betw. Bellflower Blvd., Clark Blvd., Conant and Wardlow Rds., Long Beach—by Lakewood Development Co., Long Beach. 1-24

LOS ANGELES CO.—**D. D. Gray,** 2803 Los Flores, Lynwood—$27,990 to install sewers, house connect., wye branches, manholes, etc., in Van Ness Ave., 2nd, 3rd and 4th Aves., and Century Blvd., Inglewood —by City Council, Inglewood. 1-10

LOS ANGELES CO. — **Tom L. Gogo,** 10024 S. Figueroa St., Los Angeles—$343,762 to install approx. 18,000 ft. of 54-in. to 57-in. reinf. conc. pipe in Hollydale from Main St. to Florence Ave. Joint Outfall B, Unit 1, Section 6—by County Sanitation District No. 2, Los Angeles. 1-10

LOS ANGELES CO.—**J. L. Kruly Co.,** 1785 N. Eastern Ave., Los Angeles—$59,641 to install 2.7 mi. sanitary sewers in Liblen Ave. and other sts., Los Angeles—by County Board of Supervisors, Los Angeles. 1-3

LOS ANGELES CO.—**Martin Construction Co.,** 1529 Olympic, Montebello—$53,566 to install sanitary sewers in Hindry Ave. and other sts., near Inglewood—by County Board of Supervisors, Los Angeles. 1-17

LOS ANGELES CO.—**Peter S. Tomich,** 501 N. Del Mar Ave., San Gabriel—$21,000 for constr. of sanitary sewers in tract 14173, betw. Imperial Hwy., Paramount Blvd., and Downey Rd.—by Larchmont Homes, Inc., Los Angeles. 1-17

SAN DIEGO CO.—**Carroll & Foster,** Mission Valley Rd., San Diego—$68,810 to install trunk sewer in Lemon Grove and branch line in Monterey Heights — by County Board of Supervisors, San Diego. 1-24

Montana

YELLOWSTONE CO.—**Barry O'Leary,** 423 N. 32nd St., Billings — $183,363 for constr. of sanitary sewers in Billings—by City Council, Billings. 1-3

Nevada

WASHOE CO.—**Isbell Construction Co.,** 1300 E. 4th St., Reno—$65,198 to install vit. pipe sanitary sewer lines, etc., Southridge Estates Improvement District, Reno—by City Council, Reno. 1-8

Texas

CALDWELL CO.—**Mid-West Contracting Co.,** 403 S. Haskell St., Dallas—$30,033 to install storm sewer extensions in Luling —by City Council, Luling. 1-14

TARRANT CO.—**Glade Construction Co.,** Century Bldg., Fort Worth—$17,415 to install sanitary sewers on W. Oakhurst St. and Bluebonnet Hills Addition, Fort Worth —by City Council, Fort Worth. 1-23

Washington

YAKIMA CO. — **State Construction Co.**, Seattle—$63,830 for constr. of sewer system in Yakima—by City Council, Yakima. 1-2

Waterway . . .

California

LOS ANGELES CO.—**Johnson Western Co.**, 2100 Wilmington, San Pedro Rd., San Pedro—$1,200,000 for constr. of seawall, swimming pool, 2-story conc. slab boat garage, and for excavation and dredging of harbor, Malibu—by Malibu Quarterdeck Improvement Co., Beverly Hills. 1-17

SAN DIEGO CO. — **Newport Dredging Co.**, 631 31st St., Newport Beach—$124,417 to dredge and fill approx. 830,000 cu. yd., Mission Bay at Dana Basin and Sunset Point—by City Council, San Diego. 1-10

SAN DIEGO CO.—**San Francisco Bridge Co.**, 503 Market St., San Francisco—$86,895 to dredge approx. 366,648 cu. yd. of material from Yacht Harbor, along area adjacent to existing shore line in San Diego Bay—by City Council, San Diego. 1-10

Dam . . .

Texas

COLEMAN CO.—**List & Clark Construction Co.**, Railway Exchange Bldg., Kansas City, Mo.—$1,578,664 for embankment and appurtenant work, Hordes Creek Reservoir and dam on Hordes Creek—by U. S. District Engineer, Galveston. 1-27

Irrigation . . .

California

RIVERSIDE CO.—**Otto B. Ashbach & Sons**, 2700 N. Hamline Ave., St. Paul, Minn.—$697,724 on schedule 1 for conc. canal lining from Sta. 6106 plus 06 to Sta. 6517 plus 00, Coachella Canal, All-American Canal System, near Indio—by Bureau of Reclamation, Coachella. 1-17

Washington

THURSTON CO. — **J. A. Terteling & Sons, Inc.**, Box 1428, Boise, Ida.—$14,079 to furnish material and constr. inverted syphon, Yelm—by Yelm Irrigation District, Yelm. 1-17

Tunnel . . .

California

AMADOR CO.—**T. E. Connolly, Inc.**, 461 Market St., San Francisco—will constr. unlined water transmission tunnel, approx. 2½ mi. long, lined only at portals, near Jackson—by Pacific Gas & Electric Co., San Francisco. 1-27

AMADOR CO.—**Utah Construction Co.**, 1 Montgomery St., San Francisco, **Morrison-Knudsen Co., Inc.**, Crocker First National Bank Bldg., San Francisco and **Walsh Construction Co.**, New York, N. Y. will construct water transmission tunnel, lined only at portals and approx. 8½ mi. long, near Jackson—by Pacific Gas & Electric Co., San Francisco. 1-27

Power . . .

Arizona

MARICOPA, PINAL AND PIMA COS.—**J & J Construction Co.,** Oklahoma City, Okla.—$475,165 for constr. of 3-phase, 60-cycle, single-circuit transmission line, approx. 125 mi. long, betw. Maricopa, Casa Grande and Eloy—by Bureau of Reclamation, Washington, D. C. 1-19

California

SAN DIEGO CO.—**S. A. Cummings,** 3450 Kite St., San Diego—$77,450 to install runway lights, underground duct system, etc., at Naval Air Station, North Island, San Diego—by Bureau of Yards & Docks, Washington, D. C. 1-14

Texas

ERATH CO.—**Panhandle Supply Co.,** Amarillo—$61,925 for constr. of 207 mi. of distribution lines, Stephenville—by Erath County Electric Cooperative Association, Stephenville. 1-9

Washington

OKANOGAN CO.—**James C. Roberts,** Spokane—$87,547 to dismantle Chelan Falls-Brewster line and constr. 115,000-volt power line from Omak to Tonasket—by Public Utility District No. 1, Okanogan. 1-25

Wyoming

PARK CO.—**S. H. Reither,** Aitken, Minn.—$177,586 on Schedule 1, for constr. of Heart Mountain-Garland, 69-kv. transmission line, approx. 35 mi. long, from Heart Mt. Powerplant to Garland switching station, Shoshone Project—by Bureau of Reclamation, Denver, Colo. 12-27

Building . . .

Arizona

MARICOPA CO.—**Stewart Construction Co.,** Phoenix—$130,700 for constr. of addition to technical school, Phoenix — by Board of Supervisors, Phoenix Technical School, Phoenix. 1-16

MOHAVE CO.—**W. S. Ford,** Box 928, Kingman—$47,900 for constr. of 20 two-bedroom, prefab. houses at Davis Government Camp, approx. 30 mi. W. of Kingman—by Bureau of Reclamation, Kingman. 1-8

YUMA CO.—**Will H. Minor,** Las Casas del Tovar, Yuma—$75,000 for constr. of store bldg. on NW. corner of 4th Ave. and 8th St., Yuma—by self. 1-17

California

ALAMEDA CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$165,000 for constr. of 2-story, reinf. conc. and structl. steel storage bldg. at 4901 E. 12th St., Oakland—by Pacific Rubber Co., Oakland. 1-3

ALAMEDA CO.—**Marvin E. Collins,** 825 Galvan Drive, El Cerrito—$100,000 for constr. of steel and conc. one-story addition shop bldg., 14th and Poplar Sts., Oakland—by Carnation Co., Oakland. 1-31

CONTRA COSTA CO.—**Lewis Construction Co.,** 1815 Telegraph Ave., Oakland—$115,000 for constr. of one-story, structl. steel factory bldg., Rd. 17, near Richmond—by Myers Barrel Co., Oakland. 1-24

FRESNO CO.—**Paul Spencer,** 832 W. 5th St., Los Angeles—$75,695 to move and convert bldgs. from Fresno Co. Fair Grounds to govt. campsite in Orange Cove—by Bureau of Reclamation, Friant. 1-9

HUMBOLDT CO.—**Fred J. Maurer & Son,** 125 W. 5th St., Eureka—$110,000 for constr. of steel frame and brick facing, one-story addition to present bldg. at 538 F St., Eureka—by Pacific Telephone & Telegraph Co., San Francisco. 1-15

IMPERIAL CO.—**Smith & Manchester,** 730 Cedar St., Holtville—$60,000 for constr. of produce packing shed, betw. N. 8th St. and Southern Pacific tracks, Brawley—by American Fruit Growers, Inc., Brawley. 1-24

LOS ANGELES CO.—**Guy F. Atkinson Co.,** Mission Road and Aliso St., Los Angeles—$797,800 for constr. of main bldg. substruct. Units 3, 4 and 5, Harbor steam plant, Wilmington—by Department of Water and Power, City of Los Angeles. 1-17

LOS ANGELES CO. — **Atlas Development Co.,** 6521 Wilshire Blvd., Los Angeles —$500,000 for constr. of 90 frame and stucco, 5-room dwellings in the Venice District, Los Angeles—by self. 1-3

LOS ANGELES CO.—**Baruch Corp.,** 621 S. Flower St., Los Angeles—$350,000 for constr. of 2-story and basement, reinf. conc. medical research bldg. at 4751 Fountain Ave., Los Angeles—by Cedars of Lebanon Hospital, Los Angeles. 1-17

LOS ANGELES CO. — **M. J. Brock & Sons,** 2894 Rowena Ave., Los Angeles & **Davies, Keusder and Brown,** 4915 Exposition Blvd., Los Angeles—$2,000,000 for constr. of 228 frame and stucco, one-story dwellings, Imperial Hwy. and Paramount Blvd., Rancho Los Amigos—by self. 1-24

LOS ANGELES CO.—**Foothill Construction Co.,** 3265 Mt. Curve Ave., Altadena—$1,200,000 for constr. of 107 frame and stucco, 3-bedroom dwellings, Marathon Rd., Wapello St., Raymond Ave. and Bellaire Dr., Altadena—by self. 1-23

LOS ANGELES CO.—**Garel & Labby,** 13505 Ventura Blvd., Sherman Oaks—$150,000 for constr. of 20 frame and stucco, 6-room dwellings, Sayre, Beaver and Bordon Sts., Van Nuys—by self. 1-23

LOS ANGELES CO.—**Harvey & Rose,** 11 N. 5th Ave., Arcadia—$408,510 for constr. of reinf. conc. elementary school bldgs., Lower Santa Anita Ave., Arcadia — by City School District, Arcadia. 1-30

LOS ANGELES CO.—**Nichols Engineering & Research Corp.,** 70 Pine St., New York, N. Y.—$350,000 for constr. of incinerator plant in Beverly Hills—by City Council, Beverly Hills. 1-23

LOS ANGELES CO.—**C. L. Peck,** 354 S. Spring St., Los Angeles — $250,000 for constr. of 2-story and basement, 600 seat, reinf. conc. cafeteria bldg. at 4181 Crenshaw Blvd., Los Angeles—by Broadway Department Store, Inc., Los Angeles. 1-7

LOS ANGELES CO.—**Fred E. Potts Co.,** 2516 12th Ave., Los Angeles—$275,000 for constr. of 2-story, reinf. conc. office bldg. addition 117 N. Taylor St., El Monte—by Southern California Telephone Co., Los Angeles. 1-24

LOS ANGELES CO.—**C. A. Scull,** 8469 Wilshire Blvd., Beverly Hills — $160,200 for constr. of one-story, 24-room, frame and stucco apartment bldg., 3700 block Jasmine Ave., W. Los Angeles—by Comet, Inc., Los Angeles. 1-28

LOS ANGELES CO.—**J. K. Thomas & Beyer Construction Co.,** Chamber of Commerce Bldg., Los Angeles — $500,000 for constr. of 2-story steel frame and reinf. brick addition to existing bldg., 500 Elm Ave., Long Beach—by Associated Telephone Co., Ltd., Santa Monica. 1-7

LOS ANGELES CO.—**P. J. Walker Co.,** 3900 Whiteside Ave., Los Angeles—$2,000,000 including equipment, for constr. of 3- and part 4-story, conc. and brick addition to telephone bldg. at 6822 Santa Fe Ave., Huntington Park—by Southern California Telephone Co., Los Angeles. 1-17

LOS ANGELES CO.—**P. J. Walker Co.,** 3900 Whiteside Ave., Los Angeles—$1,500,000 for constr. of 2-story and basement, reinf. conc. office and laboratory bldg., El Segundo refinery—by Standard Oil Company, Los Angeles. 1-24

LOS ANGELES CO.—**L. S. Whaley Co.,** Times Bldg., Long Beach—$900,000 for constr. of 2-story, frame and stucco, 8 to 16 unit apartment bldgs. at California Ave. and San Antonia Drive, Long Beach—by Ridgewood Heights Manor, Inc., Long Beach. 1-31

ORANGE CO.—**John C. Blystone,** 513 E. 3rd St., Santa Ana—$112,000 for converting, moving and re-erecting war surplus bldgs. from Santa Ana Air Base to Fullerton Jr. College, Fullerton — by Federal Works Agency, San Francisco. 1-17

SACRAMENTO CO.—**Central California Construction Co.,** Capitol National Bank Bldg., Sacramento—$120,000 for constr. of reinf. conc. store bldg. and plant nursery at 1223 Alhambra Blvd., Sacramento—by F. Lagomarsino & Sons, Sacramento. 1-10

SACRAMENTO CO. — **Lawrence Construction Co.,** 3020 V St., Sacramento — $250,000 for constr. of one-story, basement and mezzanine addition to bank bldg., 1011 10th St., Sacramento—by American Trust Co., San Francisco. 1-30

SACRAMENTO CO. — **Lawrence Construction Co.,** 3020 V St., Sacramento—$114,846 for alterations to 2-story, brick bldg., 700 Capital Ave., Sacramento — by State Division of Architecture, Sacramento. 1-23

SACRAMENTO CO.—**Swinerton & Walberg Co.,** 225 Bush St., San Francisco—$110,000 for constr. of addition to telephone bldg. at 411 J St., Sacramento—by Pacific Telephone & Telegraph Co., San Francisco. 1-13

SAN BERNARDINO CO.—**Fluor Corp., Ltd.,** 2500 Atlantic Blvd., Los Angeles—$4,000,000, total estimated cost, for constr. of chemical processing plant for extraction of chemicals from brine of Searles Lake—by American Potash & Chemical Co., Los Angeles. 1-17

SAN BERNARDINO CO.—**C. T. & W. P. Stover,** 116 N. Alexander Ave., Claremont—$100,000 for constr. of store and medical bldg., on S. side of Foothill blvd., E. of Euclid Ave., Upland—by H. K. Hemingway, Upland. 1-24

SAN DIEGO CO.—**Trepte Construction Co.,** 2001 Kettner Blvd., San Diego—$151,890 to recondition and alter Tioga Hotel, San Diego—by Public Buildings Administration, Washington, D. C. 1-29

SAN FRANCISCO CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$150,000 for interior and exterior remodel. of 3-story bldg., 410 Bush St., San Francisco—by Westinghouse Electric Corp., San Francisco. 1-3

SAN FRANCISCO CO. — **Cahill Bros.,** 206 Sansome St., San Francisco—$750,000 for constr. of structl. steel and conc. theater bldg. at Geary Blvd. and First Ave., San Francisco — by San Francisco Theaters, Inc,. San Francisco. 1-3

SAN FRANCISCO CO.—**Dinwiddie Construction Co.,** Crocker Bldg., San Francisco—$100,000 for constr. of addition of conc. roof for storage space, O'Connor, Moffatt & Co., O'Farrell and Stockton Sts., San Francisco—by Provident Securities, San Francisco. 1-16

SAN FRANCISCO CO.—**Fred J. Early Jr.,** 369 Pine St., San Francisco—$90,000 for constr. of one-story addition to bank bldg., California and Sansome Sts., San Francisco—by Bank of America, San Francisco. 1-24

SAN FRANCISCO CO.—**Monson Bros.,** 475 6th St., San Francisco—$850,000 for constr. of reinf. conc. and steel frame telephone exchange bldg. at 1 McCoppin St., San Francisco — by Pacific Telephone & Telegraph Co., San Francisco. 1-27

SAN FRANCISCO CO.—**Monson Bros.,** 475 6th St., San Francisco—$300,000 for constr. of 2-story reinf. conc. and steel bottling plant, 675 Treat Ave., San Francisco—by Regal Amber Brewing Co., San Francisco. 1-10

SAN JOAQUIN CO.—**Shepherd & Green,** First National Bank Bldg., Stockton—$408,460 for constr. of one-story, reinf. conc. industrial plant addition, Stockton—by Fibreboard Products Co., San Francisco. 1-2

SANTA CLARA CO. — **Dinwiddie Construction Co.,** Crocker Bldg., San Francisco —$1,000,000 for constr. of 6-story Class A reinf. conc. and steel department store bldg. on NE. corner of E. Santa Clara and S. First Sts., San Jose—by Roos Bros., San Francisco. 1-13

SANTA CLARA CO.—**Haas & Rothschild,** Merchants' Exchange Bldg., San Francisco—$350,000 for constr. of one-story addition of reinf. conc. and struct. steel over existing 2-story bldg., 529 Bryant St., Palo Alto—by Pacific Telephone & Telegraph Co., San Francisco. 1-15

SANTA CLARA CO. — **McKeon Construction Co.,** 948 Taraval St., San Francisco — $5,000,000 for constr. of 600 dwellings on 66-acre site, N. First St., adjacent to Rosemary Gardens Subdivision, San Jose—by San Jose Development Co., San Jose. 1-14

SANTA CLARA CO.—**Pasetta Construction Co.,** 2795 Park Ave., Santa Clara—$100,000 for constr. of first unit of auto parts mfg. plant in Pasetta industrial subdivision, Santa Clara - Alviso Rd., Santa Clara—by D. W. Fether, Los Angeles. 1-29

SANTA CLARA CO. — **Pittsburgh - Des Moines Steel Co.,** Neville Island, Pittsburgh, Pa.—$167,100 for constr. of first unit of steel fabricating plant, 70-acre site at NW. corner of Bayshore Hwy. and Santa Clara-Alviso Rd.—by self. 1-20

SOLANO CO. — **Stolte, Inc.,** 8451 San Leandro St., Oakland & **Morrison-Knudsen Co., Inc.,** Crocker First National Bank Bldg., San Francisco—$3,000,000, supplemental contract, for constr. of 4-story and basement, reinf. conc., 150-bed hospital in Fairfield—by U. S. Engineer Office, Sacramento. 1-27

STANISLAUS CO.—**Frederick G. Haase & Associates,** Perkins—$122,500 for constr. of frame and brick veneer frozen food warehouse on F St. at 1st and S. Pacific Sts., Patterson—by Food Facilities, Inc., Sacramento. 1-29

STANISLAUS CO.—**M. A. Little Co.,** 1 Grand View Ave., San Francisco—$150,000 for constr. of conc. block and structl. steel cannery bldg. at 1st and M Sts., Patterson—by Patterson Products Co., Patterson. 1-24

SUTTER CO. — **Younger Construction Co.,** 575 Mission St., San Francisco—$200,000 for constr. of reinf. conc. and steel frame one-story and basement bldg., betw. Clark St. and Forbes Ave., adjacent to Sacramento Northern Railroad, Yuba City —by Yuba City Walnut Packing Co., Yuba City. 1-17

VENTURA CO.—**Johnson Western Co.,** 2100 Wilmington — San Pedro Rd., San Pedro—$75,000 for constr. of temporary housing facilities at guided missile test center, Point Mugu, near Oxnard — by

Bureau of Yards & Docks, Washington, D. C. 1-17

VENTURA CO.—**MacDonald & Kruse, Inc.,** 816 Allen Ave., Glendale—$100,000 for constr. of temporary housing facilities, at guided missile test center, Point Mogu, near Oxnard — by Bureau of Yards & Docks, Washington, D. C. 1-17

Colorado

MESA CO.—**Olson Construction Co.,** Box 366, Salt Lake City, Utah—$3,406,000 for constr. of 150-bed veterans admin. hospital at Grand Junction—by U. S. Engineer Office, Washington, D. C. 1-24

Nevada

WASHOE CO. — **DeArmond, Voss & Huck,** 3021 Rowena Ave., Los Angeles, Calif.—$700,000 for constr. of one main and 16 smaller hotel bldgs. on 15-acre site on Skyline Blvd., SW. of Reno—by self. 1-30

Oregon

LANE CO.—**Waale-Camplan & Co.,** 2100 SW. Jefferson St., Portland—$142,000 for constr. of addition to telephone bldg. in Eugene—by Pacific Telephone & Telegraph Co., San Francisco, Calif. 1-20

MULTNOMAH CO.—**Campbell, Lowrie, Lautermilch Corp.,** Chicago, Ill.—$172,000 for constr. of one-story mfg. plant at 3750 NW. Yeon Ave., Portland—by Lloyd A. Fry Roofing Co., Summit, Ill. 1-2

MULTNOMAH CO.—**Knott, Rogers & Dunbar,** 425 NE. Tillamook St., Portland —$75,000 for constr. of conc. theater bldg. at 7804 SE. Stark St., Portland—by Fred Teeny, Portland. 1-10

MULTNOMAH CO. — **Reimers & Jolivette,** Railway Exchange Bldg., Portland —$750,000 to remodel 7-story office bldg., Portland — by Lincoln Building, SW. Fourth and Fifth Aves., Portland. 1-2

MULTNOMAH CO. — **Reimers & Jolivette,** Railway Exchange Bldg., Portland —$81,000 for constr. of addition to mfg. plant, Portland—by Western Waxed Paper Co., Portland. 1-2

MULTNOMAH CO.— **Sandberg-Asbahr Co.,** 2140 NE. Union Ave., Portland—$440,000 for constr. of 5 wood frame and brick veneer, 2-story and basement bldgs., 54 two-bedroom apts., at 300 N. Sumner St. block, Portland—by T. E. C. Inc., Portland. 1-10

Texas

CLAY CO. — **Dolph Construction Co.,** Thomas Bldg., Dallas—$108,000 for constr. of one-story school bldg. in Henrietta—by Midway Consolidated School District, Henrietta. 1-20

DALLAS CO. — **Nathan Wohlfeld,** Box 7084, Dallas—$244,000 for constr. of 2-story office and bus garage bldg., Dallas—by Continental Bus Co.,.Fort Worth. 1-8

TARRANT CO.—**Jim Miller,** 2602 Chestnut St., Fort Worth—$100,000 for constr. of 3-story hotel bldg., 3rd and Burnett Sts., Fort Worth — by Boots Simpson, Fort Worth. 1-9

TARRANT CO.—**Oscar Quisle,** First National Bank Bldg., Fort Worth—$163,428 for constr. of school facilities at university, Fort Worth—by Board of Supervisors, Texas Christian University, Fort Worth. 1-8

TOM GREEN CO.—**G. & E. Construction Co.,** 1915 Guadalupe St., San Angelo—$246,000 for constr. of school bldg. and boiler house in San Angelo—by College District of Tom Green County, San Angelo. 1-6

WICHITA CO.—**Glade Construction Co.,** Wichita Falls—$70,700 for constr. of school facilities at Hardin College, Wichita Falls —by Ray Arnhold, Wichita Falls. 1-14

Washington

BENTON CO.—**Brady Construction Co.,** 707 Spokane St., Seattle — $104,688 for constr. of annex to court house, Prosser—by County Council, Prosser. 1-14

COWLITZ CO. — **Quoidbach Construction Co.,** Longview—$1,000,000 for constr. of plywood mfg. plant in Longview—by Weyerhaeuser Timber Co., Longview. 1-2

KING CO.—**Archie Iverson & Co.,** 1139 Market St., Seattle—$1,300,000 for constr. of 100 brick veneer duplex dwellings in Seattle—by self. 1-13

KING CO. — **Metropolitan Construction Co.,** Douglas Bldg., Seattle—$175,000 for constr. of 3-story, frame and stucco, 24-unit apartment bldg., Second Ave. N. and Roy St., Seattle—by White & Bollard, Inc., Seattle. 1-28

KING CO.—**Nettleton & Baldwin,** 1109 No. 36th St., Seattle—$4,500,000 for constr. of forty-four 4, 8, 12, 16 and 20-unit bldgs. to contain 544 apartments on Ambaum Way, betw. SW. 136th and 140th Sts., Seattle—by Lake Burien Heights Holding Corp., Seattle. 1-8

KING CO.—**Howard S. Wright & Co.,** 407 Yale Ave. N., Seattle—$900,000 for constr. of 2-story, with tower, reinf. conc. newspaper plant, one block square, Fifth and Sixth Ave., and Wall and Battery Sts.,

Seattle — by Seattle Post-Intelligencer, Seattle. 1-8

KITTITAS CO.—**MacLean Construction Co.**, 717 Elliott Ave. W., Seattle—$1,214,370 for constr. of reinf. conc. 2-story bldg. and boiler plant at the college grounds, Ellensburg—by Central Washington College of Education Board, Ellensburg. 1-29

PIERCE CO. — **D. V. Davidson Co.**, Provident Bldg., Tacoma—$4,000,000 for constr. of 513 one and 1½-story dwellings in West Moorland Addition, Tacoma—by Corliss Investment Co., Tacoma. 1-23

PIERCE CO. — **Hykes Construction Co.**, 2800 E. Howell St., Seattle—$1,000,000 for constr. of 2-story apartment bldgs., Oneida Gardens, Sand Point Dist., Tacoma—by Carroll, Hillman & Hedlund, Inc., Seattle. 1-24

Miscellaneous . . .

California

CONTRA COSTA CO.—**Western Pipe & Steel Co.**, 200 Bush St., San Francisco—$4,508,532 on Schedule 1, to furnish lined steel pipe for constr. of Second Mokelumne Aqueduct, Unit B, betw. Geary Rd., Walnut Creek and Bixler Station, near Brentwood—by East Bay Municipal Utilities District, Oakland. 12-27

LOS ANGELES CO.—**Hess Construction Co.**, 2303 E. Artesia, Long Beach—$230,920 to grade, pave, constr. conc. curbs and gutters, sidewalks, culverts, etc., in Tract 13204, betw. Bellflower and Clark Blvds., Conant and Wardlow Rds., Long Beach—by Lakewood Development Co., Long Beach. 1-24

SAN FRANCISCO CO.—**Charles L. Harney**, 625 Market St., San Francisco—$183,266 to reconstr. inner tracks betw. Fremont and Eddy Sts. on Market St., San Francisco—by City and County Public Utilities Commission, San Francisco. 1-2

VARIOUS COS. — **Consolidated Steel Corp.**, 5700 S. Eastern Ave., Los Angeles—$2,500,000 for fabrication only of 100 mi. of 26-in. steel pipe, part of gas pipeline from Texas to Calif.—by El Paso Natural Gas Co., El Paso, Tex. 1-10

Colorado

LARIMER CO. — **Allis-Chalmers Manufacturing Co.**, Denver—$537,592 to furnish 3 vertical-shaft, hydraulic type turbines for Estes Park Plant, approx. ½ mi. below Estes Park—by Bureau of Reclamation, Washington, D. C. 1-9

LARIMER CO. — **General Electric Co.**, Denver—$626,746 to furnish 3 vertical-shaft three-phase generators for Estes Park Plant and one generator for Marys Lake Plant, for Colorado-Big Thompson project—by Bureau of Reclamation, Washington, D. C. 1-9

LARIMER CO.—**Newport News Shipbuilding & Drydock Co.**, Newport News, Va.—$164,604 for one hydraulic type, 11,300 hp. turbine for Marys Lake Plant—by Bureau of Reclamation, Washington, D. C. 1-9

Montana

VARIOUS COS.—**Fairchild Aerial Survey, Inc.**, 224 E. 11th St., Los Angeles, Calif.—$431,460 to make photographic maps of 7830 sq. mi. in upper Missouri River basin, will be used for preliminary investigation for constr. of 26 units of dams and reservoirs, Missouri Basin project—by Bureau of Reclamation, Washington, D. C. 1-17

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

MOORE EQUIPMENT CO.'s manufacturing plant at Stockton, Calif., has been purchased by the INTERNATIONAL HARVESTER CO. Under terms of the sale Harvester will take over 160,000 sq. ft. of floor space under roof, 155,000 additional sq. ft. under concrete, and all the plant's machine tools and equipment. Stockton plant production will augment the output from Harvester's other plant at Huntington Park in southern California. Under the new setup, Moore Equipment is to vacate most of the plant by February 15, and all of it by June 1, 1947. Present plans call for the company to continue its dealership for quonset strand steel buildings, Allis-Chalmers tractor, General Motors trucks and diesel engines and other lines of farming, contracting and industrial equipment. All shop and office employes of the plant will be offered similar employment with the new Harvester subsidiary.

G. S. Parsons, after three years in the army, is now open for business in San Diego, as a dealer representing THE LINCOLN ELECTRIC CO., Cleveland, O., the world's largest manufacturer of electric arc welding equipment. Parsons has been affiliated with the company for nearly fourteen years, and at one time was with the factory branch office in Los Angeles.

☆ ☆ ☆

The move of a major industry to Los Angeles was officially completed late in December with the beginning of mass-production of gasoline engines in the new plant of the McCULLOCH MOTORS CORPORATION located adjacent to the Los Angeles airport. The company was originally established in Milwaukee, Wis.,

MINIATURE REPLICAS of machinery and layout in the plant being studied by Gerald Robechaud and John Ryde (upper photo). Below, architect's drawing of the new plant. Smaller building to be used for research, the larger for offices.

as McCulloch Aviation, Inc., and is headed by **Robert P. McCulloch,** president. Associated with McCulloch at his new headquarters are **Gerald Robechaud,** vice-president in charge of tooling, and **John Ryde,** chief engineer, both of whom were with the original company in Milwaukee.

☆ ☆ ☆

Joseph C. Costello, manager of the San Francisco District, Explosive Sales Department, ATLAS POWDER CO., retired January 1. Out of 37 years in the explosives industry, 25 years were in the service of Atlas. Succeeding him is **William T. Mahood,** who has been assistant to Costello since last April. Prior to that he had been Manager of the Seattle District.

☆ ☆ ☆

PACIFIC NORTHWEST

On January 1 the PACIFIC COAST CEMENT CO. resumed independent operations of the Diamond Cement Plant in Seattle. It will continue to manufacture Diamond brand cement for the markets of the Pacific Northwest and Alaska. Headquarters are located at 3801 E. Marginal Way.

☆ ☆ ☆

NORPAC, INC., 1000 King St., Seattle, has been granted the Northwest distributorship for aluminum building materials produced by the Reynolds Metals Co. The products, which will be handled for Oregon

and Washington, include 5-V crimp storm seal roofing, snal seal roofing, aluminum clapboard siding, aluminum weatherboard siding, and embossed ceiling panels. Structural members and accessories are also available. **William C. Sparks, Jr.,** is secretary and sales manager for Norpac, Inc.

☆ ☆ ☆

LECKENBY STRUCTURAL STEEL CO., Seattle, is established in its new plant at 2745 Eleventh Ave., SW., on Harbor Island. Construction of the new plant is practically completed and includes a 62 by 100-ft. welded structural steel frame and corrugated sheeting building on reinforced concrete foundation. Officers of the firm are **William S. Leckenby,** president; **Frank V. Seidelhuber, Jr.,** vice-president, and **Roy C. Erickson,** treasurer.

☆ ☆ ☆

R. W. Stevens, purchasing agent for the INTERMOUNTAIN EQUIPMENT CO., Boise, has been appointed manager of the company's Spokane, Wash., branch, succeeding **Elton L. Haines,** who resigned Jan. 1.

☆ ☆ ☆

AMONG THE MANUFACTURERS

R. G. LeTOURNEAU, INC., Peoria, Illinois, recently announced the appointment of **Robert C. Judd** as Market Research Manager. Before joining LeTourneau, Judd conducted his own sales research firm. He has also been associated with the Shaw-Box Crane and Hoist Division of Manning, Maxwell & Moore, Inc., Muskegon, Michigan, where he served as market analyst and manager of the statistical department. Judd replaces **Wendell Richards,** who resumes his District Sales Representative activities.

☆ ☆ ☆

Joseph Samuel Young, president of the LEHIGH PORTLAND CEMENT CO., was selected chairman of the board of directors of the Portland Cement Association. He succeeds **M. Moss Alexander,** president of the Missouri Portland Cement Co., who has been chairman of the board for the past two years. Young has long been prominent in business and civic affairs throughout the country.

☆ ☆ ☆

Frederick R. Lack, vice-president of WESTERN ELECTRIC CO., will be president of the AMERICAN STANDARDS ASSOCIATION for the ensuing year. Lack succeeds **Henry B. Bryans,** executive vice-president of the PHILADELPHIA ELECTRIC CO. He was formerly vice-president of the A.S.A. **George H. Taber, Jr.** will be vice-president of the association for the coming year. He is executive vice-president of the SINCLAIR REFINING CO., and was already a member of the A.S.A. Board of Directors.

☆ ☆ ☆

After 26 years of service, **Albert C. Walsh,** purchasing agent, has retired, according to a recent announcement of THE TIMKEN ROLLER BEARING COMPANY, Canton, Ohio. Walsh joined the Timken firm when it purchased the assets of the Gilliam Manufacturing Company, with whom Walsh was then employed.

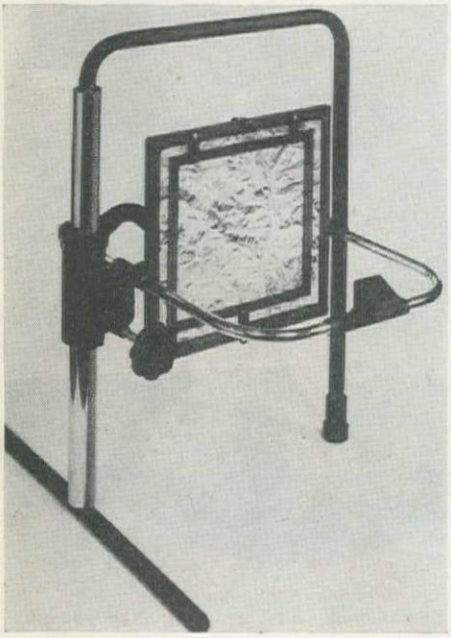
NEW EQUIPMENT

Mapping Instrument

Manufacturer: Fairchild Camera & Instrument Corp., Jamaica, N. Y.

Equipment: New instrument for mapping aerial photographs.

Features claimed: The Rectoplanigraph is a portable, light-weight instrument, easily assembled and disassembled, which can be set on a drafting table. Based on the principle of the camera lucida, it provides mapmakers with a simple means of rectifying and transferring planimetric detail from aerial photographs to maps and charts. Its design provides indexed adjustments for three focal lengths (6, 8¼ and 12 in.), a micrometer adjustment for all variations in scale, and adjustments for rectification of the photographs to compensate for errors introduced by tip and tilt. A picture-holder is fitted with masks to accommodate air-photos ranging from 4 in. x 5 in. to 9 in. x 9 in. A high quality prism assures a well-illuminated image.



Small Scraper Unit

Manufacturer: R. G. LeTourneau, Incorporated, Peoria, Ill.

Equipment: Small, high-speed scraper unit.

Features claimed: Built to answer the need for high-speed dirt moving on small yardage projects, the D Tournapull is powered by an 85 hp. gasoline engine and equipped with the new E-4 Carryall Scraper, which has a load limit of 4 tons and a struck capacity of 3.3 yards. The self-loading unit has 4 speeds forward, 4 reverse, and travels up to 23 miles per hour. Outstanding feature is the revolutionary new electric control by individual electric motors, eliminating need of a power control unit for scraper operation. New type differential keeps both wheels pulling at all times, while air brakes add to safe operation. This small, fast rig is extremely maneuverable, able to turn on a 25-ft. fill and to turn in its own length (22 ft., 5 in.) from a full stop.

Air King Compressors

Manufacturer: Worthington Pump and Machinery Corp., Harrison, N. J.

Equipment: New line of air compressors designed around established motor horsepowers.

Features claimed: This line includes single-stage and two-stage sizes for pressures up to 250 psi. for mating to standard motors of 1 to 15 hp., inclusive. Arrangements include self-contained power-driven models mounted on bases or tanks as well as bare compressors for either direct or V-belt connection to drivers. Such compressors supply air for a wide variety of industrial uses such as paint-spraying, operating pneumatic controls, tools, laundry presses, bottle filling machines, sandblasting, cleaning and blowing, inflating tires, etc. The "Air King" also introduces an entirely new

principle in automatic starting of compressors. A centrifugal clutch permits the driving motor to attain full speed before the compressor turns. This eliminates the need for starting unloaders, check valves, release and bleeder valves, etc. Direct power drive eliminates transmission losses and drive adjustments. It provides simplicity and compactness, at the same time resulting in neat, attractive appearance. An adequate guard incloses all moving parts assuring safety and cleanliness.

Dump Truck

Manufacturer: Kenworth Motor Truck Co., Seattle, Wash.

Equipment: Model 888, 20-yd. dump truck.

Features claimed: This heavy-duty truck features an offset cab which provides greater than usual visibility for the driver, a Knuckey dual chain drive bogie, either a 295-hp. Hall-Scott gasoline or a 200-hp.

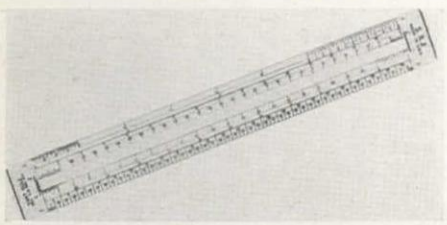
Hercules diesel motor, and 14.00 x 24 tires. Optional equipment includes 16.00x24 tires on rear wheels, and power steering. Gross capacity of the truck is 53 tons, and body equipment consists of a 20-yd. water level rock type actuated by a twin cylinder telescopic hoist which raises the body to a dumping angle of 50 deg.

Drafting Scale

Manufacturer: Stewart-Jackson Instrument Co., Los Angeles, Calif.

Equipment: New drafting scale.

Features claimed: Eight different scales are incorporated on one side of this transparent plastic instrument. The scale need not be turned over to find calibrations of



⅛ in., ¼ in., ⅜ in., ½ in., ¾ in., 1 in., 1½ in., and 3 in. per ft. Calibrations and numerals are in red to facilitate reading against black and white drawings or blue prints. Overall length is 13½ in. with scales reading to 12 in. All edges are beveled.

Tire Carrier

Manufacturer: T. E. D. Corp., Los Angeles, Calif.

Equipment: New Ted truck tire carrier.

Features claimed: The carrier is bolted to the chassis frame of truck, trailer or bus, either at the rear or side. It is constructed

to withstand a load stress equal to four times the load it carries under normal use. No straining or lifting is necessary to remove the spare and replace the flat. Even tilting to an upright position for rolling is done without lifting. After the tire-changing procedure, the carrier is tilted on a cradle swivel to a horizontal position, pushed back under chassis in a carrying position and securely fastened there with positive clamps that prevent vibration when on the road. Carriers are available in two sizes and with choice of holding down bars —for disc wheel or demountable rim.

AC Welder

Manufacturer: The Lincoln Electric Co., Cleveland, O.

Equipment: "Fleet-Arc" AC welder.

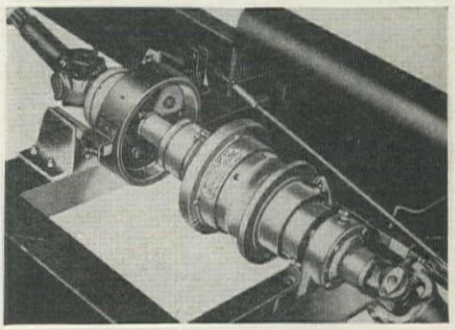
Features claimed: The new "Fleet-Arc," equipped with the "Arc Booster," surpasses the conventional AC welders in ease of welding, depth of penetration, range of output, economy of operation, safety, dependability and service life. The "Arc-Booster" augments the current the instant the arc is struck. The arc is started automatically the moment the electrode touches the work. This added feature of the new welder has been accomplished safely without the use of special high frequency devices or higher voltage. A selector switch on the front of the welder governs the amount of booster current to be used in striking the arc. This provides a complete range of striking intensity to suit requirements in the welding of thin sheets or heavy plates, making of tack welds, or in the use of various types and sizes of electrodes. The reactor current control, held in position by cone brakes and actuated by a self-cleaning chain drive, is smooth running and durable. Separate power transformer and adjustable reactor control enable the new unit to duplicate the wide range of output of DC welders, and at the same time simplify the low current welding of thin sheets and increase the welding of heavy plates at high current value. The lower open-circuit voltage gains a higher power factor and a reduction of condenser requirements.

Power Take-offs

Manufacturer: Davey Compressor Co., Kent, O.

Equipment: Eight new heavy duty power take-offs.

Features claimed: The Davey power take-off uses, as its basic principle, an internal and external gear drive, operating as a strong and durable spline rather than the series of rotating or meshing gears found in transmission type take-offs. Installation is made to the rear of the truck transmission case. The power take-off then becomes an integral part of the drive shaft assembly for transmitting power direct from the



truck engine either through V-belts or chain drive. The eight take-offs are available in three separate capacities—50, 75 and 100 hp. Model 50 is manufactured in both single and simultaneous drive designs. The latter permits operation of truck, or individual operation of driven equipment, or of both simultaneously. Models 75 and 100 are manufactured for single, simultaneous, and double drive. With double drive take-offs, the truck may be operated alone; either of two pieces of driven equipment may be operated individually, or both pieces of driven equipment may operate simultaneously.

Kinetic Mixer

Manufacturer: The Foote Company, Inc., Nunda, N. Y.

Equipment: Three cu. ft. Kinetic mixer.

Features claimed: This mixer, designed to handle all types of cold asphaltic mixes,

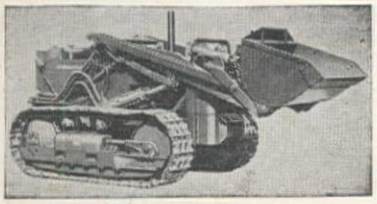
ncluding sheet asphalt and asphaltic concrete, produces two batches of asphalt per minute under good conditions. Operating cycle at this speed is 5 seconds for charging from a wheelbarrow, 20 seconds for mixing, and 5 seconds for discharging by a hand-controlled chute at the top of the machine. Mixing action is accomplished by a revolving drum and three stationary blades. The mixer is powered by a 12 hp. gasoline engine, or can be equipped with an electric motor. Over-all height is 58 in., length 81 in., width 68 in. Approximate weight is 1500 lb.

Bulldozer-Shovel

Manufacturer: Frank G. Hough Co., Libertyville, Ill.

Equipment: Bulldozer-shovel.

Features claimed: The new Model 9-A, specifically built into the International T-9 and TD-9 TracTracTor, is a dual purpose unit which may be equipped with either a full track width 1-yd. bucket or bulldozer



blade. The bucket is raised, lowered, dumped and relatched entirely by hydraulic control, eliminating practically all physical effort on the part of the operator. Bucket tilts back automatically in carrying position preventing spillage. Since overhead and side structures are eliminated, a full 360-deg. visibility is possible. A long, high dumping reach is provided for dumping into trucks, hoppers, etc.

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.

LIGHT AND POWER—**Davey Compressor Co.**, of Kent, Ohio, has recently published a booklet describing four new DA-V-LITE portable lighting and power units. Complete specifications are given of the Floodlight, Searchlight, Combination and Beacon models. In addition to their lighting uses, the units can be employed to supplement existing power facilities or to provide motive power for electric tools.

OFF-ROAD EARTHMOVING DESIGN—**Caterpillar Tractor Co.**, Peoria, Ill., has just released a 12-page booklet which describes its DW 10 Tractor, a rubber-tired machine designed and built for heavy, off-road earthmoving operations. Its heavy duty 100 horsepower Diesel engine has been built to "take it" when the going gets rough. Action pictures of this tractor with a variety of drawn equipment as used on different kinds of jobs are shown as well as model views of the Diesel engine and brief specifications of the equipment.

TOOL OF MANY USES—**Templeton, Kenly & Co.**, Chicago, Ill., recently issued a 4-page bulletin picturing and describing the uses of the Simplex Util-A-Tool which

in one unit provides the solution to many problems encountered daily in every type of plant operation. It will straighten frames, push and pull machinery, clamp parts together for welding or assembly, lift and support tractors and other machinery, pull all sizes of wheels and perform any number of other jobs.

SMALL PORTABLE PLANT—**Iowa Manufacturing Company,** Cedar Rapids, Iowa, has manufactured a new, small, portable crushing and screening plant called the Pitmaster Straightline. The primary crusher is a 10 in. by 16 in. roller bearing jaw crusher and the secondary is a 16 in. by 16 in. roller bearing roll crusher. The 30 in. by 9 ft. 5 in. double-deck horizontal vibrating screen gives the plant exceptionally low traveling height. Conveyors are ball bearing, channel-frame type for light weight. Pulley shafts have special permanently sealed, self-aligning anti-friction bearings. Total weight of the Pitmaster is 31,000 lbs. without power unit; transport length with feeder attached is 33 ft. and traveling height 11 ft. The plant is operated by a 50-60 h.p. gasoline or diesel engine. The Pitmaster is a complete gravel plant and can be quickly converted into a modern quarry plant by putting a portable primary ahead of it. A new illustrated bulletin describing the Pitmaster has just been released.

MODERN DESIGN TRACTOR — **Caterpillar Tractor Co.,** Peoria, Ill., recently published an attractive, new, 32-page catalog explaining the advantages to be found in the Diesel D7 Tractor. The all "Caterpillar"-built — engine, fuel system, tractor, spray cooled pistons, gasoline starting engine, "Finger tip" steering, five-bearing crankshaft, removable flywheel clutch, sealed track rollers with replaceable parts and positive transmission gear shift lock and many other parts and functions of the D7 are discussed and thoroughly illustrated.

EARTH-MOVING LOADER — **The Euclid Road Machinery Co.** of Cleveland, Ohio, has sent off the presses an interesting 8-page booklet giving complete information about the Euclid Model BV Loader stating that its efficiency and speed have been proved on such work as dams, airports, highway and railroad construction. Large belt capacity, wide cutting edge and ease of operation provide fast loading of hauling units in a short travel distance. Heavy duty design and construction throughout assure long life and trouble-free performance with minimum maintenance cost. Specifications of the BV Loader are given and pictures of the scraper and its features are shown.

RUBBER PRODUCTS FOR CONTRACTORS — **Raybestos - Manhattan, Inc.,** Passaic, New Jersey, has put out a folder in color emphasizing the numerous uses of Manhattan Rubber Products in construction work. Graphically illustrated are various uses of belting on conveyors, elevators, graters and muckers. The use of hose for pile driving, draining, harbor work and heavy duty road work represent just a few of its functions. Caption-type information is given about the rubber products used in the action photographs.

SLUDGE PLANT DIGESTER—**The Dorr Co.,** of New York City, N. Y., has published a 58-page, two-color treatise on Dorr Digesters, Single-Stage and Multdigestion, as well as the history, theory and practice of the art of digesting sewage sludges under controlled chemical, physical and thermal conditions. The history is traced from the early work at Birmingham, England and Baltimore, Md. in 1912 up to the present time; basic theory and practical factors are discussed; and operational difficulties are explained with recommended solutions. One section is devoted exclusively to calculations of sizes, heat losses and heating requirements with typical examples in each case. The portion dealing with the various types of Dorr Digesters is unusually complete. Each of the eight different types is covered with a complete description, photograph, general plan and elevation drawings and a complete set of specifications. General engineering information, presented in chart form, covers such factors as the effect of temperature on the time of digestion; the effect of rapid stirring on gas production per pound of volatile matter destroyed; the effect of period of digestion on percentage reduction in volatile matter and on per cent solids content of sludge and the relation between solids remaining after digestion and ash in sludges.

STABILIZING THE SOIL — **Harnischfeger Corp.,** Milwaukee, Wis., has sent off the press a 12-page, color booklet that graphically portrays the work to be accomplished by the P & H "Single-Pass" Soil Stabilizer. As the booklet points out the soil stabilizer meets the 8 basic requirements for new construction or re-construc-

OPPORTUNITY SECTION

ion of all weather highways, streets, airports and parking areas. It is equipped with two separate liquid systems, one for water and the other for bituminous fluids. These pressure systems, under full control of the operator, may be operated in unison or as individual units.

INDUSTRIAL ENGINES — **McCulloch Motors Corporation,** Los Angeles, Calif., has announced a new 8-page brochure describing their 2-cycle Series 1200 die-cast industrial gasoline engines, from 2½ to 4 hp. Details on standard engines now in mass production are given, as well as information on special engines which the company is prepared to design and mass-produce for a wide variety of customer applications in the transportation, marine, implement, aircraft-auxiliary and other fields.

WALL FORM CONSTRUCTION— **Universal Form Clamp Co.,** Chicago, Ill., has put out an 18-page catalog emphasizing the numerous features of the uni-form system of wall form construction. The assembly, alignment, corners, pilasters and fillers as well as various types of walls are thoroughly discussed, photographed and diagrammed.

GLUED LAMINATED STRUCTURAL LUMBER — **West Coast Lumbermen's Association,** Portland, Ore., has published a folio dealing with the recommended minimum standards for design and fabrication of glued laminated structural lumber. The detailed specifications given in the publication will be found valuable by architects, engineers, building officials and others who require accurate information on the subject. Part I of the booklet deals with the special factors to be considered in designing laminated structural members, as well as the grades of lumber demanded, and appropriate working stresses. Part II contains recommended specifications for the materials (lumber and glue), and their preparation for use. Proper stress transferring joints are covered, as are specifications for workmanship.

INDEX TO ADVERTISERS

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