WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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FEBRUARY • 1948

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$4.00 PER YEAR

ALAMEDA CREEK Highway Bridge, concrete box girder type structure near completion 3 mi. east of Niles, Calif. canopies entrance to the Western Pacific Railway tunnel. The new span replaces an old narrow bridge. The $427,000 contract for the job is held under a combination bid by R. G. Clifford and Al Biasotti and Son, contractors of Stockton, Calif.

Photo by courtesy of Bethlehem Pacific.

UP GOES YOUR FOOTAGE

DOWN COME YOUR COSTS

When your drills are protected against wear and rust with *Texaco Rock Drill Lubricants E. P.*

THERE is less work for the "drill doctor" when you keep drills in condition with *Texaco Rock Drill Lubricants E.P.* These fine "extreme pressure" lubricants have ample film strength to protect moving parts under even the severest conditions.

In addition, *Texaco Rock Drill Lubricants E.P.* resist oxidation, flow readily, and prevent rust whether drills are running or idle. Their use helps you drill more footage, assures less servicing, longer drill life.

Texaco Rock Drill Lubricants E.P. are approved by leading rock drill manufacturers. Use the viscosities recommended for your particular drills and operating conditions. And to keep your compressors efficient – valves clean, rings free, airlines clear – use the recommended *Texaco Alcaid, Algol or Ursa Oil.*

A Texaco Lubrication Engineer will gladly advise you. Just call the nearest of the more than 2500 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Rock Drill Lubricants E. P.

TUNE IN . . . TEXACO STAR THEATRE presents the TONY MARTIN SHOW every Wednesday night. • METROPOLITAN OPERA broadcasts every Saturday afternoon.

IT'S THE *TOUGH JOBS* THAT MAKE NORTHWEST REPEAT ORDERS

Grafe Callahan's experience with Northwest goes back many years. Since the purchase of their first Northwest they have steadily added to their fleet. Theirs is heavy work—plenty of rock work in rugged country where they've needed the best they could own—work that really proved equipment.

It is outfits like this that have made one out of every three Northwests sold a repeat order and this is the kind of an outfit to check with when you plan for future equipment on your work.

Asking the user is still the best way to find out whether you will get the kind of service *you* want.

Let us tell you about Northwest advantages. Follow the Northwest Crowd.

NORTHWEST ENGINEERING CO.
135 South LaSalle Street
Chicago 3, Illinois

13 NORTHWESTS for Grafe Callahan Construction Company Dallas, Texas

...cal NORTHWEST sales agents

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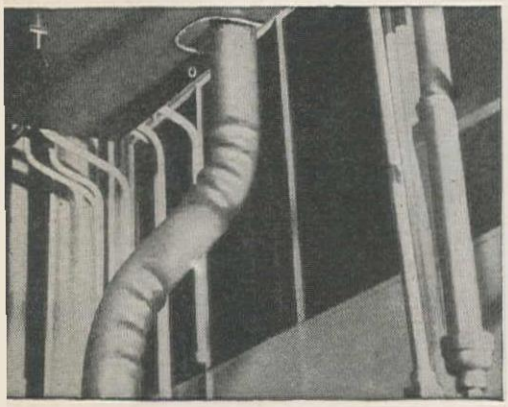
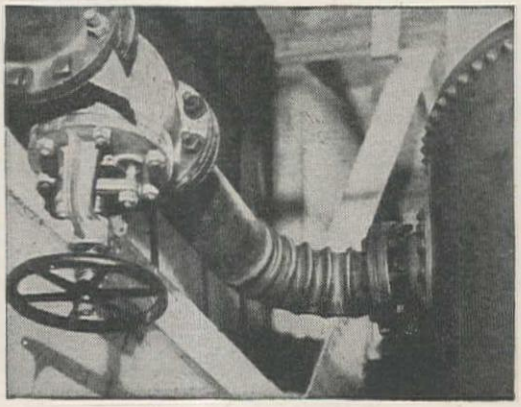
1234 Sixth Ave., South

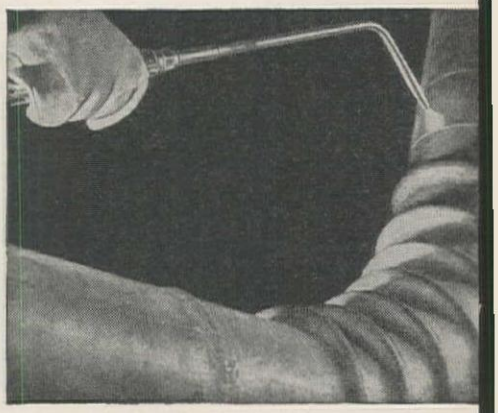
"Tailor-Made" Bends



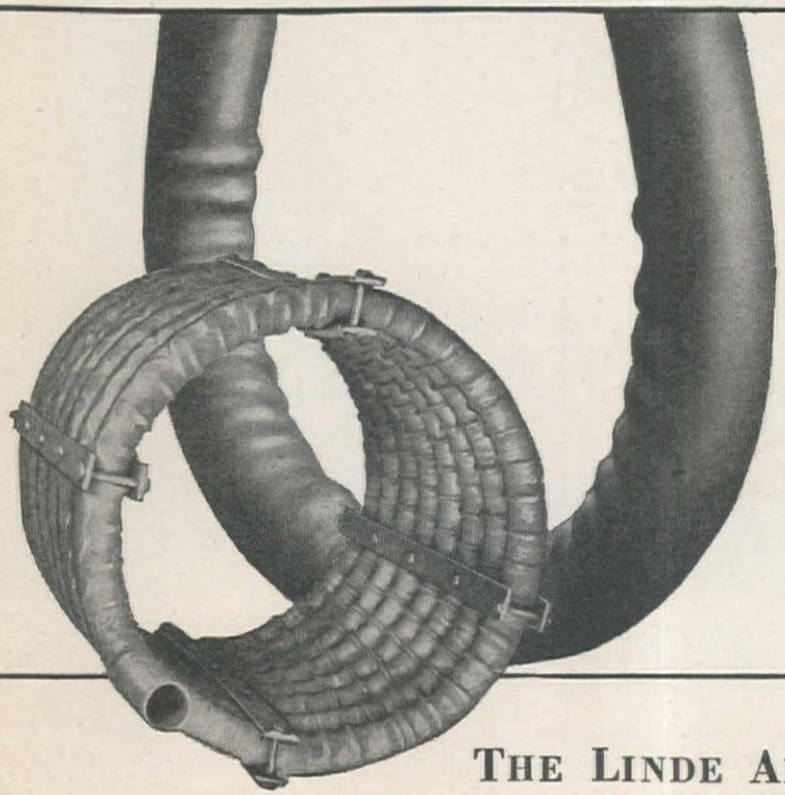
Where compound bends are required in a continuous section of pipe, wrinkle-bends offer an ideal solution. Wrinkle-bends are leakproof, as strong as the pipe itself, require no maintenance, and are easy to insulate.



This short-radius wrinkle-bend joins a compressed air line to a reservoir. Wrinkle-bends can be made in brass, copper, aluminum, and steel pipe from 2 inches to 26 inches in diameter.



Pipe bends can be made right on the spot with the aid of an oxy-acetylene welding or heating blowpipe, a simple bending rig, and a few common tools. Wrinkle-bending does not reduce the thickness of pipe walls.



This condenser coil made from 2-inch stainless steel pipe has 350 wrinkle-bends.

There are many LINDE methods for forming, cutting, joining, and treating metals. LINDE engineering service is always on call to help customers with production, construction, and maintenance jobs. Just call the nearest LINDE office.

Linde

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

Volume 23 **FEBRUARY • 1948** Number 2

TABLE OF CONTENTS

Covering the Western Half of the National Construction Field

America's Most Powerful

Get the Benefit of These Features

Greater Power—180 H.P. at the flywheel, 167 Belt Horsepower and 140 Drawbar Horsepower. Unmatched by any other crawler!

Higher Speed—The TD-24 is built for high speed operation as well as for tremendous pull.

"Planet-Power Steering" means greater drawbar pull on turns—power on both tracks! Also pivots easily!

Hydraulic "Finger-tip Control"—relieves operator of work in maneuvering this agile giant. Provides instant High-Low Range shift.

Quick Reverse Shift—bypasses speed change gears to permit instant forward-to-reverse and reverse-to-forward shift.

Synchromesh Transmission—permits shifting "On the Go"!

8 Speeds Forward and 8 Speeds Reverse—provides correct gear for each load condition.

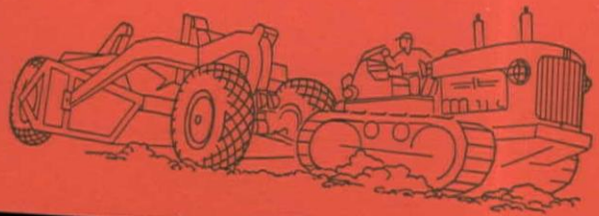
THIS new, versatile giant of power and pull now rolls off the production line at International Harvester's mammoth Melrose Park Works. It is America's *most powerful* and *easiest to operate* crawler. It cannot be beat for work capacity!

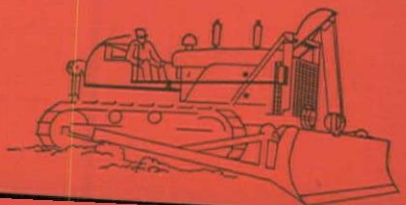
See your International Industrial Power Distributor soon and get the whole story, including specifications and delivery data, on this new Diesel tractor. When you put the TD-24 to work on your jobs, watch your earth-moving costs drop.

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

CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

INTERNATIONAL





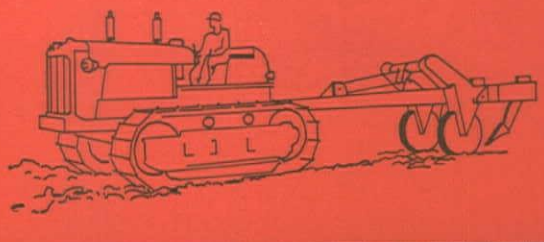
Crawler Tractor

The INTERNATIONAL TD-24

The new leader in the big power class of Diesel crawlers. No matter how big the load or how tough the going, the TD-24 operator is master of the job.

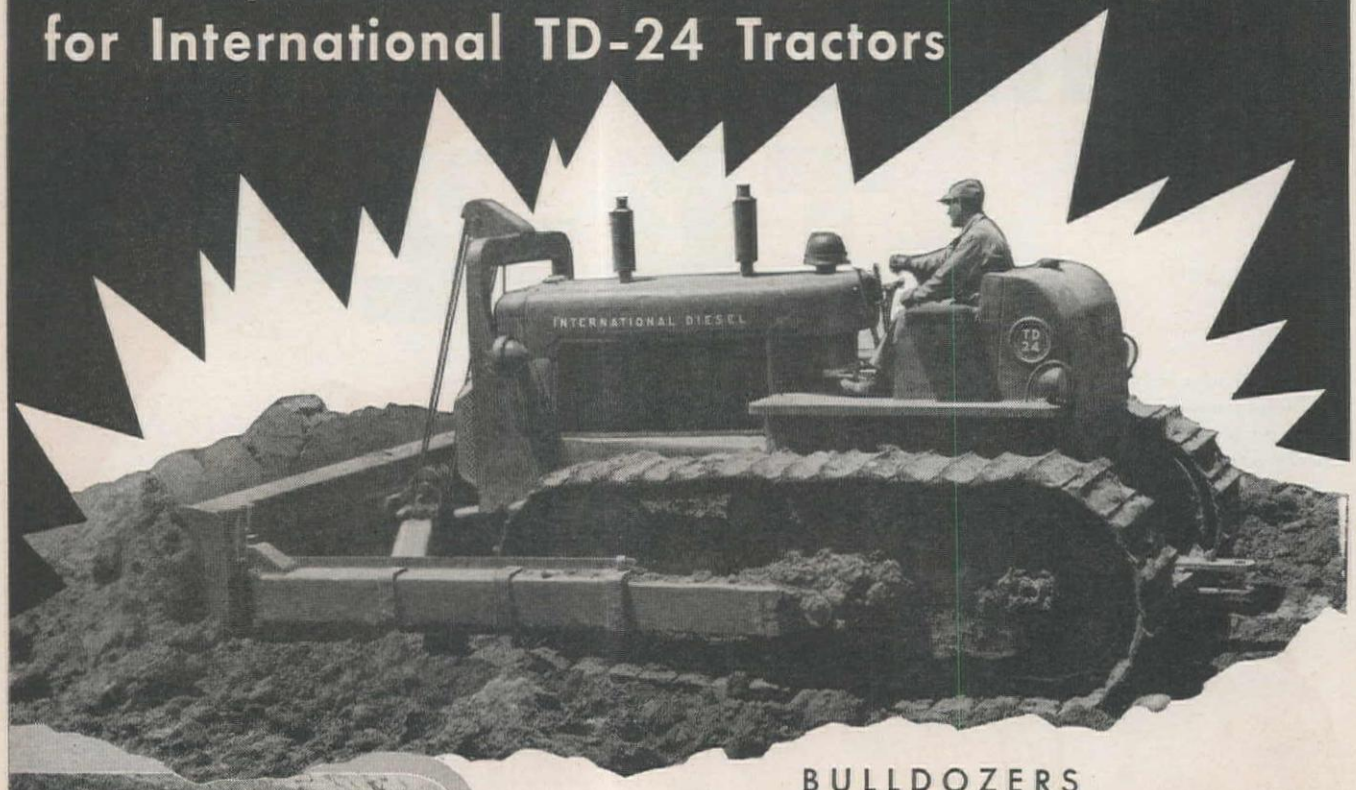
INTERNATIONAL HARVESTER

Industrial Power



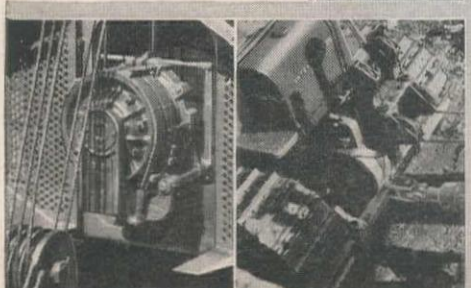
Bucyrus-Erie Announces . . .

A Complete New Line of Tractor Equipment for International TD-24 Tractors



Scientifically curved Bullgrader blade keeps dirt on the move.

The B-250 scraper has 22 cu. yds. struck capacity. Hinged apron provides greater opening.



WINCHES: Left: Front-mounted single drum winch. Right: Rear-mounted double drum winch.

BULLDOZERS

Sturdily built, thoroughly field-tested with the tractor. Highly wear-resistant alloy steel blade, reinforced for hard digging, curved to keep dirt rolling. Reversible cutting edge. Box-section push arms, with vertical diagonal braces strongly welded to blade. Simple, effective cable control. Combination of castings and weldments for strength and durability. Easy to apply to the tractor.

BULLGRADERS

Unusual visibility for accuracy, efficiency and safety of control. Tilting and angling adjustments for increased versatility. Manganese steel blade of high tensile strength. Reversible cutting edge. Replaceable cast steel corner shoes. Loads and thrusts placed to make most efficient use of tractor power. Cable controlled, with large sheaves placed well out of the way of dirt . . . simple cable reeving.

SCRAPERS

Four-wheel scrapers of 13.5 and 22 cubic yards struck measure capacity. Low center of gravity and wide-spread rear wheels furnish outstanding stability. Exclusive double-curve cutting edge . . . loads more uniformly with less horsepower. Positive rolling ejection takes less power . . . permits dumping and spreading in higher gear. Hinged, two-part apron on 22-yard scraper provides exceptionally wide opening for handling sticky or bulky materials. Can also be used as conventional single-piece apron . . . changeover requires only a few minutes. Main frame sides protected from wear by alloy steel side cutters bolted to side frames. Cutters are reversible for longer life.

Power Control Winches

Front-mounted single drum winch for use with bullgrader or bulldozer blade. Rear-mounted double drum winch for blade and scraper combinations. Planetary drive . . . constant live power instantly available. Low hand lever loads — conveniently located controls. Cool-running . . . interchangeable bands . . . single adjustment takes up all planetary main bearings. Band adjustments are easy to make, long lasting. Cushioned action is easy on cable, tractor and equipment.

So. Milwaukee **BUCYRUS ERIE** **Wisconsin**

93T47

See Your INTERNATIONAL Industrial Tractor Distributor

A right tire for each job

— right in body, right in tread, and built to do more work, take more punishment, move more dirt faster at lower cost than any other work tires made today.

That's why —

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND

BUY and SPECIFY
GOODYEAR
— it pays!

1898 GOODYEAR 50 ANNIVERSARY 1948

Sure-Grip, All-Weather—T.M.'s The Goodyear Tire & Rubber Company

GOODYEAR

Start earlier in the spring with extra capacity

Haul More pay yards per year...with fewer delays from weather conditions

LETOURNEAU EQUIPMENT

See your Le Tourneau Distributor NOW for complete information

. . . work later next fall

"B" TOURNAPULL

MORE FLOTATION — Extra big 24.00 x 29 tires on the new 29-yard B Tournapull have tapered beads for lower pressures, more ground contact. Eliminates rim slippage . . . helps rig ride over soft spots . . . travel safely over sticky or slippery grades.

SURE-FOOTED TRACTION — New-type differential automatically supplies 4 times as much power to drive wheel on firmest footing . . . enables Tournapull to walk through deep mud, sand, snow and ice that would stall any ordinary dirtmover.

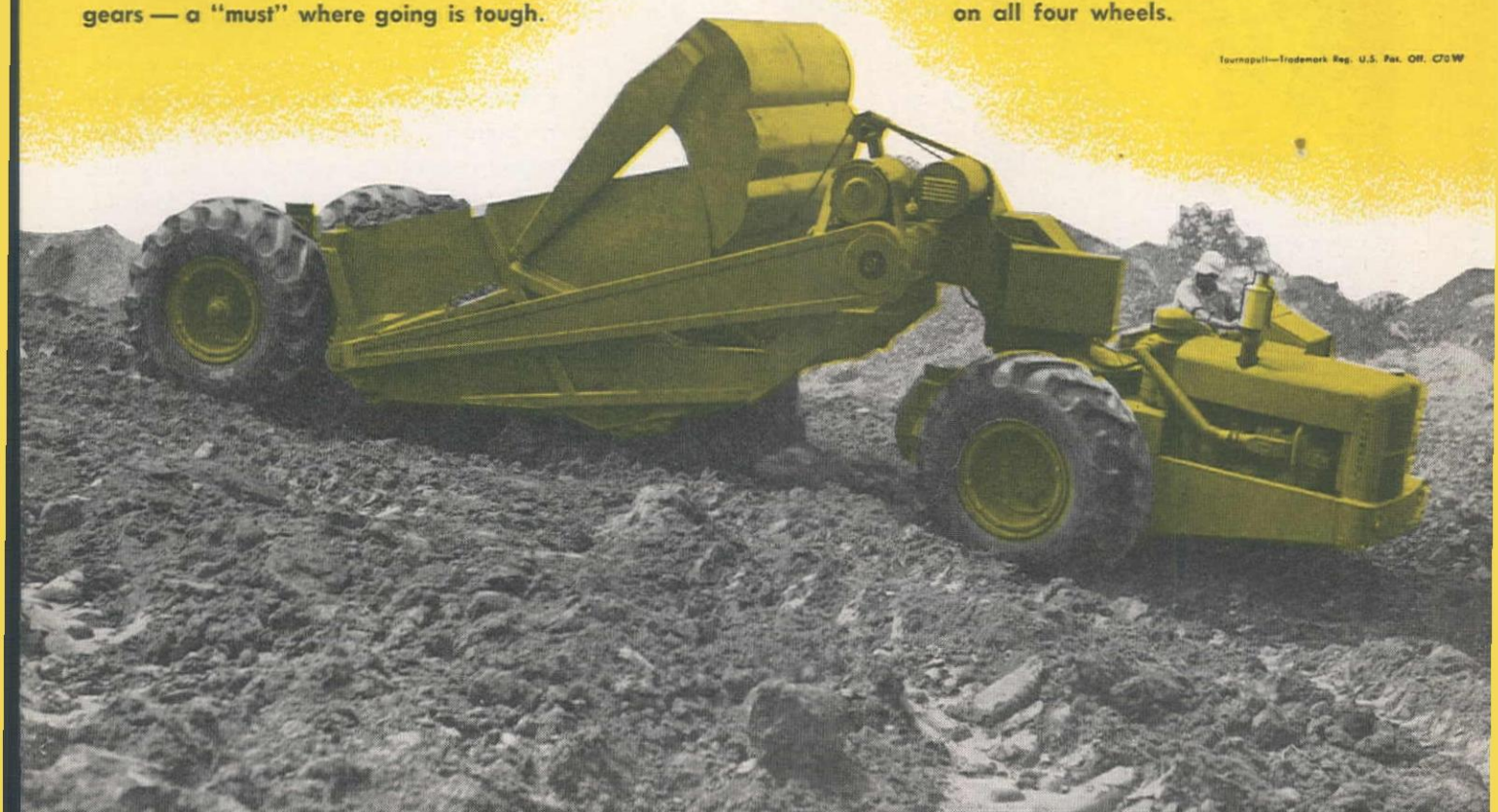
INSTANTANEOUS SPEED SELECTION — New constant mesh transmission provides instant acceleration . . . enables operator to change gear speeds anytime without loss of momentum or stopping to shift gears — a "must" where going is tough.

POSITIVE POWER STEER — Electric operated gear on yoke king-pin steers Tournapull and Scraper as one integral unit . . . keeps rig rolling in desired direction regardless of conditions underfoot. 90° turning radius increases safety and maneuverability.

FINGER-TIP ELECTRIC CONTROL — All operations are electrically controlled by individual motors, with convenient finger-tip control from dashboard. Reduces operator fatigue . . . makes entire operation safer, easier to control accurately — especially in bad weather.

DEPENDABLE POWER AND BRAKING — Husky 225 h.p. diesel engine provides ample power to pull through the toughest kind of going. Quick, non-swerving stops assured by big, multiple-disc air-brakes on all four wheels.

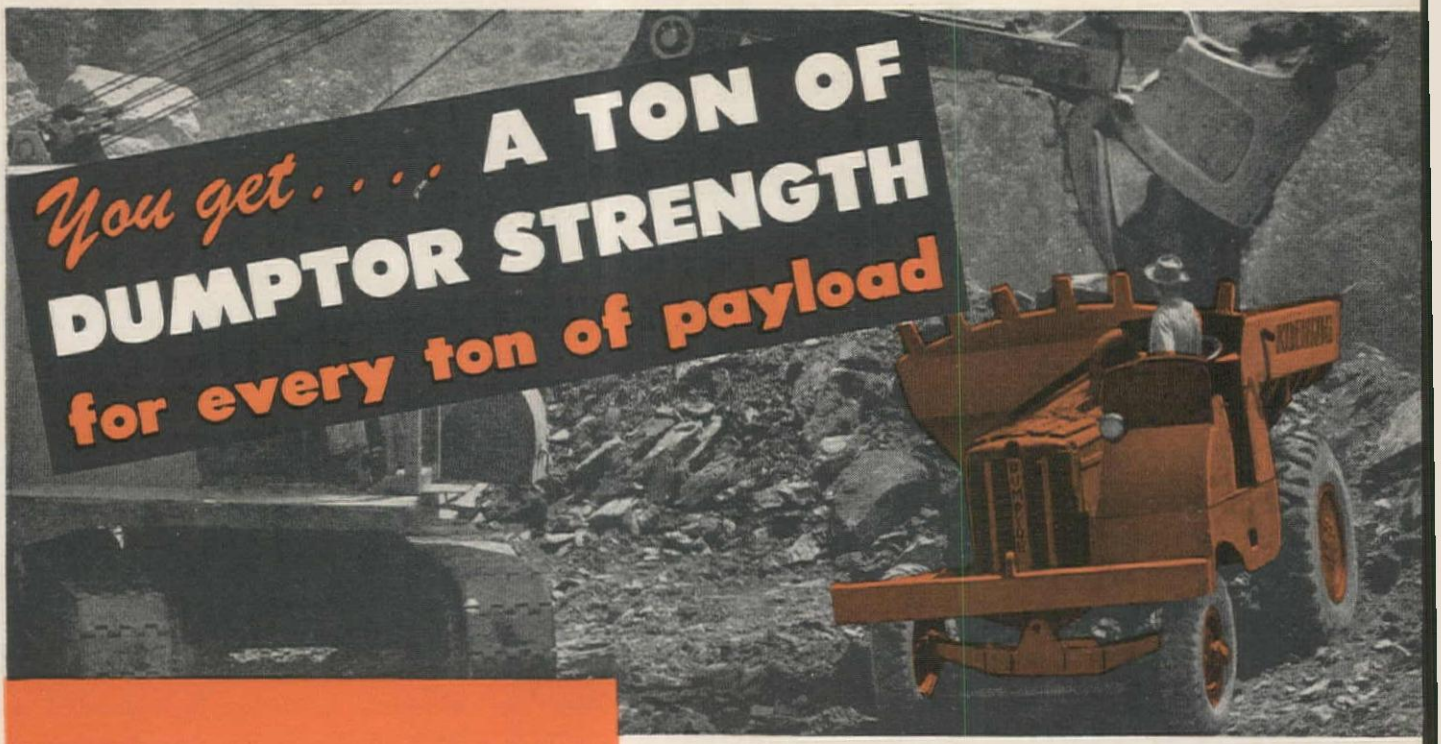
Tournapull—Trademark Reg. U.S. Pat. Off. C70W



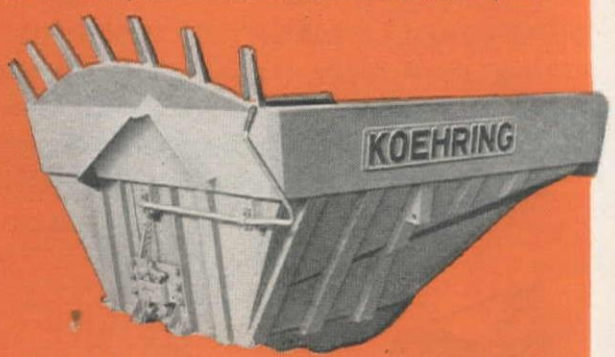
LETOURNEAU
PEORIA, ILLINOIS

EXTRA-CAPACITY TOURNAPULLS

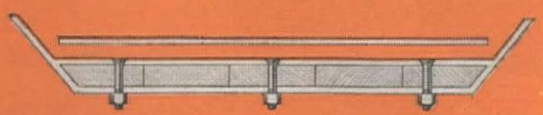
FOR LOWEST NET COST PER YARD



When a 1½-yard shovel dumps, over 2 tons of rock crash into your Dumptor. Koehring Dumptors can take this punishment day after day . . . many, still going strong, have been in heavy rock service like this for more than 10 years.



All-welded sides, ends and bottom of heavy-duty 6-yard Dumptor body are heavily ribbed with 4" channels. High-carbon steel gives extra strength at stress points where the abrasive action of rock handling is most severe.



Kick-out pan adds an extra 3/16" high manganese steel plate on top of the sturdy, shock absorbing, three-layer, steel-oak-steel bottom.

KOEHRING HEAVY DUTY

GRAVITY DUMP BODY HEAVILY REINFORCED

Dumptors stand up under the severest shocks of shovel-loading 1½ to 2½ yards of rock at a pass because they're built extra tough for rock handling. There's more than a ton of net vehicle weight for every ton of payload.

All-welded body sides, ends and bottom are heavily reinforced with 4" channel ribs. More than triple strength has been built into the bottom . . . seasoned 1⅝" oak timbers are securely bolted between two layers of 5/16" steel plate. Steel-oak-steel construction cushions shocks of rock loading. Free-swinging, kick-out pan adds another tough 3/16" high manganese steel plate for extra protection.

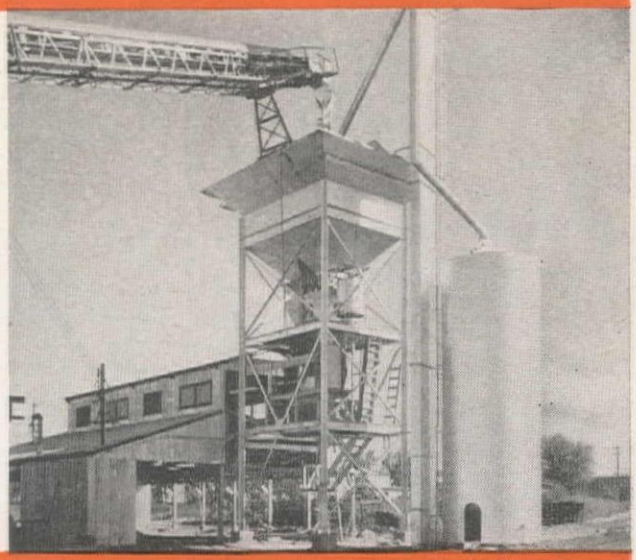
Rugged main frame, 8" ship-channels, heavily trussed . . . one-piece steel drive-axle housing and transmission case . . . 4" chrome steel drive axles . . . and cast alloy steel "I" beam steering axle add extra strength to Dumptor chassis.

Heavy-duty construction like this assures you that Koehring Dumptors will stand up under your toughest assignments . . . that there will be little down time with Dumptors on your job. For complete facts, see your Koehring distributor today.

Bay Cities Equipment, Inc., *Oakland*
Columbia Equipment Co., *Portland, Boise*
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*

KOEHRING HEAVY-DUTY
DUMPTOR — Trade Mark Reg. U. S. Pat. Off. CK819

JOHNSON ACCURATE-CONTROL PLUS LONG-LIFE MIX PLANTS



WHEN you plan for expansion, remodeling or new construction of mix plants, call on the C. S. Johnson Company's specialized skill and experience. Their engineering know-how in producing all types of concrete plants will save you time and money. That's why you'll find hundreds of Johnson plants throughout the country today, consistently delivering long-life, profitable service. It will pay you to discuss your plans with the Johnson distributor near you.

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

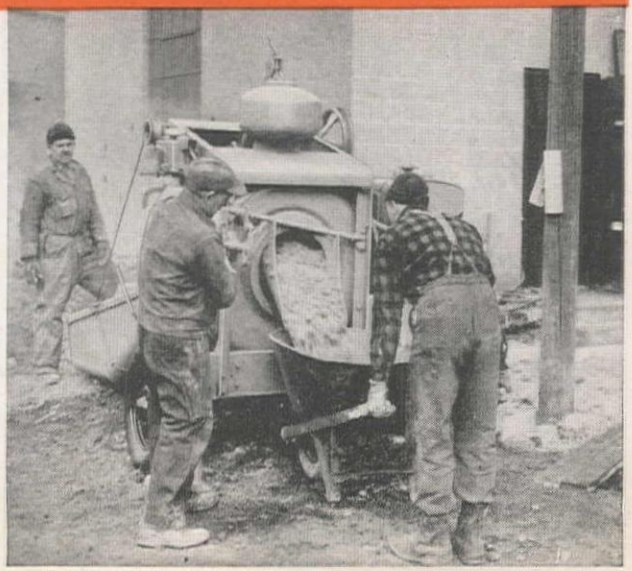
PARSONS HIGH-SPEED HEAVY-DUTY 221 TRENCHLINER*

ABILITY to produce maximum trench per hour at lowest cost has made Parsons outstanding in the trenching field for over 40 years. The new 221 ladder-type Trenchliner (illustrated) incorporates all up-to-date Parsons improvements . . . full crawler traction . . . shiftable boom . . . quick-shift, arc-type conveyor . . . arched frame for improved balance and clearance. The 221 digs trenches up to 8'6" deep, 36" wide. See your Parsons distributor.

*Reg. U. S. Pat.

Bay Cities Equipment, Inc.	Oakland
Columbia Equipment Company	Portland, Boise
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 FASTER CHARGE AND DISCHARGE DANDIE



CHARGE and discharge faster with the Kwik-Mix 6-S Dandie because *speed* is built into the mixer. All controls are conveniently arranged, easy-to-reach. Every second saved on each batch means money saved on the job . . . money in *your* pocket! You'll produce better concrete, too, with the exclusive Kwik-Mix blade-and-bucket remixing action. Learn more facts from your Kwik-Mix distributor.

Bay Cities Equipment, Inc.	Oakland
Columbia Equipment Company	Portland, Boise
Harron, Rickard & McCone Co. of So. Calif.	Los Angeles
Kimball Equipment Company	Salt Lake City
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Pacific Hoist & Derrick Company	Seattle
The Harry Cornelius Company	Albuquerque
Western Machinery Company	Spokane

146 Euclids

Merriman Dam at Lackawack, New York, is a $14,300,000 contract scheduled for completion in 1949. It will provide an additional one hundred million gallons of water daily to New York City. The length of the dam will be 2550 feet and the height 190 feet above stream bed.

EUCLID
THE PIONEER

EUCLIDS

are doing the job on

MERRIMAN DAM

Shown above is a 25 cubic yard Bottom-Dump Euclid being loaded by a 4½ yard shovel . . . material is hauled about 1½ miles to grizzly.

Below—a Rear-Dump Euclid discharges its 22-ton load over the bank on the rock section of the fill.

● Merriman Dam, largest rolled-fill dam in the East, will require excavation of 7,000,000 cubic yards of earth and rock. It is being built by S. A. Healy Company, White Plains, N. Y., for the Board of Water Supply of New York City. When completed it will furnish the nation's largest city with 100,000,000 gallons of water daily and will store 50 billion gallons.

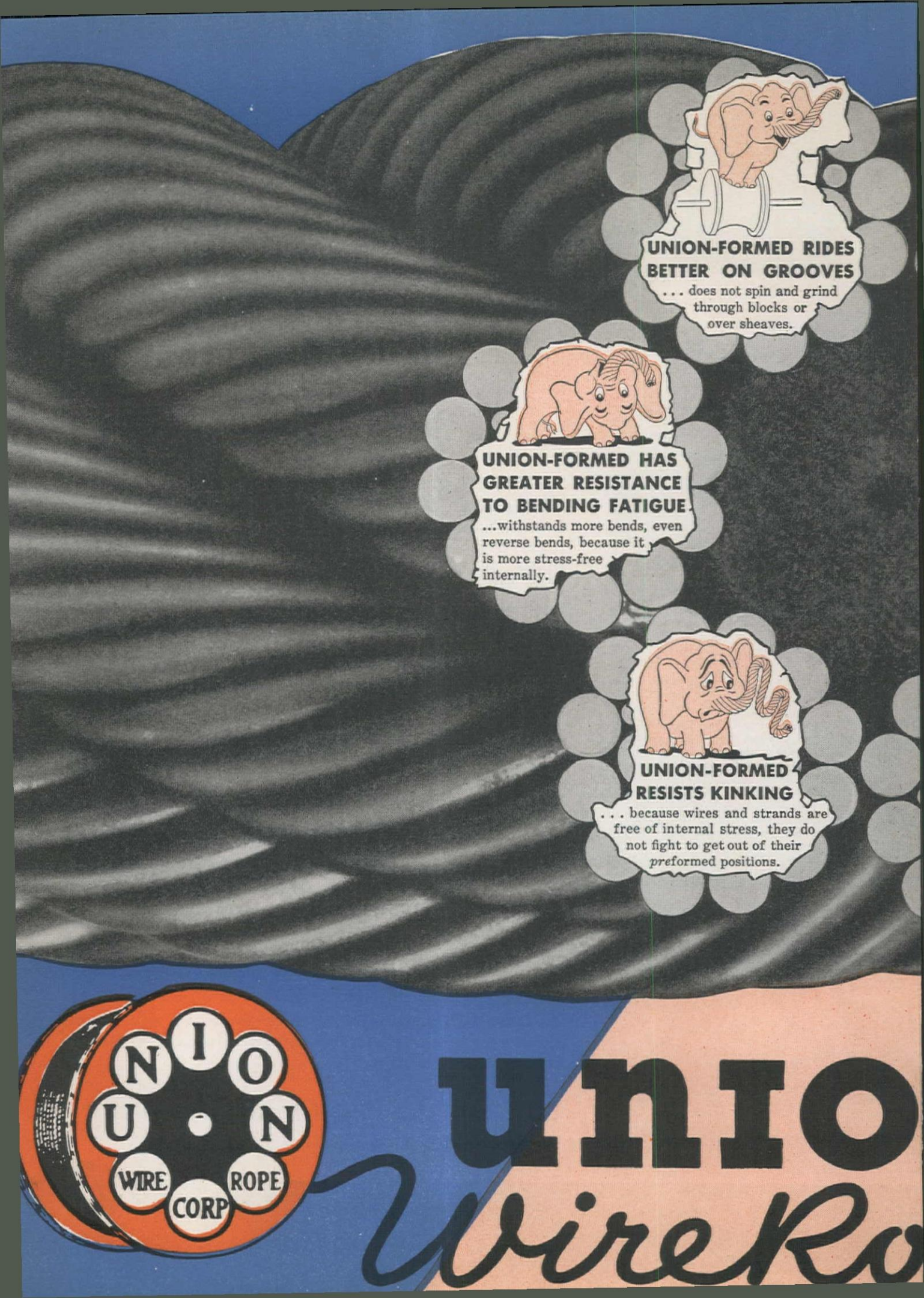
EUCLIDS ARE ON THE JOB . . . A fleet of 146 "EUCS" hauls rock, earth and rip-rap from borrow pits to grizzly to fill. Rear-Dump Euclids range in capacity from 15 to 22-tons. . . . Bottom-Dumps from 13 to 25 cubic yards, struck measure. Loaded in various borrow pits by shovels of 2 to 4½ yard capacity, Bottom-Dump "EUCS" haul material to the grizzly and dump without stopping. Both Rear-Dumps and Bottom-Dumps are used to move rock and earth from the grizzly to fill. Loaded hauls average from ½ to 1½ miles in length.

On this huge project as on hundreds of other earth moving jobs, Euclids have lived up to their reputation for top performance. Ability to move big yardage under a wide range of operating conditions has enabled the contractor to keep the work ahead of schedule. The rugged construction, large capacity and staying power of Euclids result in low cost per ton or yard moved.

Your Euclid Distributor or Representative will be glad to show you how Euclids can cut your hauling costs and increase your profits.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

Move the Earth

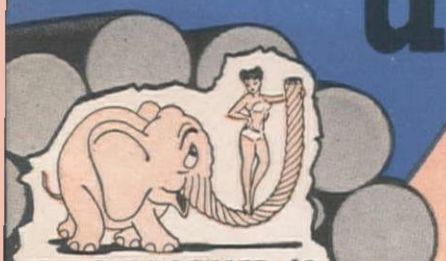

UNION-FORMED RIDES BETTER ON GROOVES
. . . does not spin and grind through blocks or over sheaves.
UNION-FORMED HAS GREATER RESISTANCE TO BENDING FATIGUE
...withstands more bends, even reverse bends, because it is more stress-free internally.
UNION-FORMED RESISTS KINKING
. . . because wires and strands are free of internal stress, they do not fight to get out of their preformed positions.
UNION
WIRE ROPE CORP
union
WireRo

union-formed

(*Preformed*)

STRONGER

LASTS LONGER

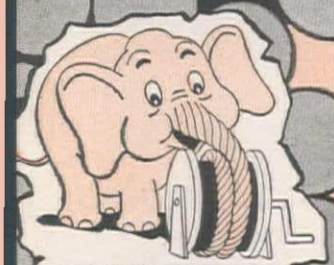


UNION-FORMED IS SAFER TO HANDLE

. . . worn, broken wires do not spring out and porcupine but continue to lie close to the rope.

UNION-FORMED IS FLEXIBLE and RELAXED

...bends in any direction, yet has "toughness" to withstand jerking and other punishing strain.



UNION-FORMED SPOOLS BETTER

. . . even with a light load it winds evenly and tightly.

Few products have so many extra advantages to offer as Union-Formed (*Pre*formed) Wire Rope. Look at them! Safer to handle... flexible and relaxed... greater resistance to bending fatigue... resists kinking... spools better... rides better on grooves. You save time and labor costs in quicker installation, splicing, and socketing... in reduction of accidents. Each of these advantages has actual dollar and cents value to the user—each fills a need for greater economy, safety, finer performance in the field.

Key to the exceptional quality and durability of Union-Formed Wire Rope is its *pre*formed construction. Before the wire rope is constructed, each strand is precision shaped to lay in the exact position which it will take in the completed wire rope. Thus, torsion and internal stresses which fatigue strands, cause them to break quickly and spring out are completely eliminated by *pre*forming.

To assure you of getting the Union-Formed Wire Rope best suited to your job, the pedigree of each reel of wire rope is recorded. A quick check tells which rope has the tensile strength, torsional values, fatigue life, ductility, hardness of wire, etc., to give you the longest, most satisfactory service.

Union-Formed Wire Rope is made by specialists who devote their whole time to the making of fine quality wire rope. It is supplied to you by distributors who share this "know-how" and who are fully equipped with a thorough working knowledge of wire rope applications.

See your nearest Union Wire Rope distributor. Tell him you want "Union-Formed". He will help you analyze your operating conditions and recommend the wire rope constructions to meet the exact specifications for your job.

Your Union Wire Rope
DISTRIBUTOR IS LISTED IN YELLOW SECTION OF YOUR TELEPHONE DIRECTORY

n

re

UNION WIRE ROPE CORPORATION

2146 MANCHESTER AVE. **KANSAS CITY 3, MO.**

Send book, bulletin, or circular as checked.

- ☐ Steel Tendons
- ☐ Rope Dope No. 1
- ☐ Splicing Wire Rope
- ☐ Socketing Wire Rope
- ☐ Wire Rope Lubrication
- ☐ Mining Rope Circular
- ☐ Choker Rope Circular
- ☐ Slusher Rope Circular
- ☐ Correct Handling of Wire Rope

FIRM NAME _____

ADDRESS _____

CITY _____

ZONE _____ STATE _____

For lowest first cost..

you can't beat LaPLANT-CHOATE 4-yd. hydraulic operated scrapers and high-speed, rubber-tired industrial tractors . . . . . .

LaPlant-Choate 4-yd. scrapers have all the features for moving more dirt at less cost. Offset cutting edge and powerful hydraulic down pressure insure instant penetration in any type of material and 25% faster loading. Positive forced ejection means fast, accurate spreading. Modern design and low center of gravity provide maximum maneuverability and minimum maintenance and upkeep expense.

You can use these handy 4-yd. units with almost any type of industrial rubber-tired tractor with sufficient horsepower. They will pay for themselves and the tractor in a hurry and step up your profit range on an infinite variety of earthmoving jobs.

Ask your nearest LaPlant-Choate distributor for a copy of Bulletin A-1142-A for specifications. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th Avenue, Oakland 3, Calif.

COMPARE THE COST AND PRODUCTION

No. of Units	Approx. Cost Tractor & Scraper	*Production in Yds. Per Hour One Way Haul				
		200′	400′	600′	1000′	2000′
1	$ 6,500	69	55	50	44	32
2	13,000	138	110	100	88	64
3	19,500	207	165	150	132	96

*Production based on 50 minutes per hour operating efficiency, level loading, average working conditions and average material.

LaPLANT-CHOATE

HIGH SPEED EARTHMOVING EQUIPMENT

FOR LOWEST POSSIBLE COST PER YARD..PER JOB..PER YEAR

and HIGHEST YARDAGE PER HOUR on your small earthmoving jobs

Easily converted for use with track-type tractors.

INDUSTRIAL EQUIPMENT COMPANY OF SOUTHERN CALIFORNIA
4441 Santa Fe Avenue
LOS ANGELES 11, CALIFORNIA

WESTERN MACHINERY COMPANY
1004 Speer Boulevard
DENVER, COLORADO

WESTERN CONSTRUCTION EQUIPMENT CO.
505 N. 24th Street
BILLINGS, MONTANA

218 W. Pine Street
MISSOULA, MONTANA

GENERAL EQUIPMENT COMPANY
1201 East 2nd Street
RENO, NEVADA

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

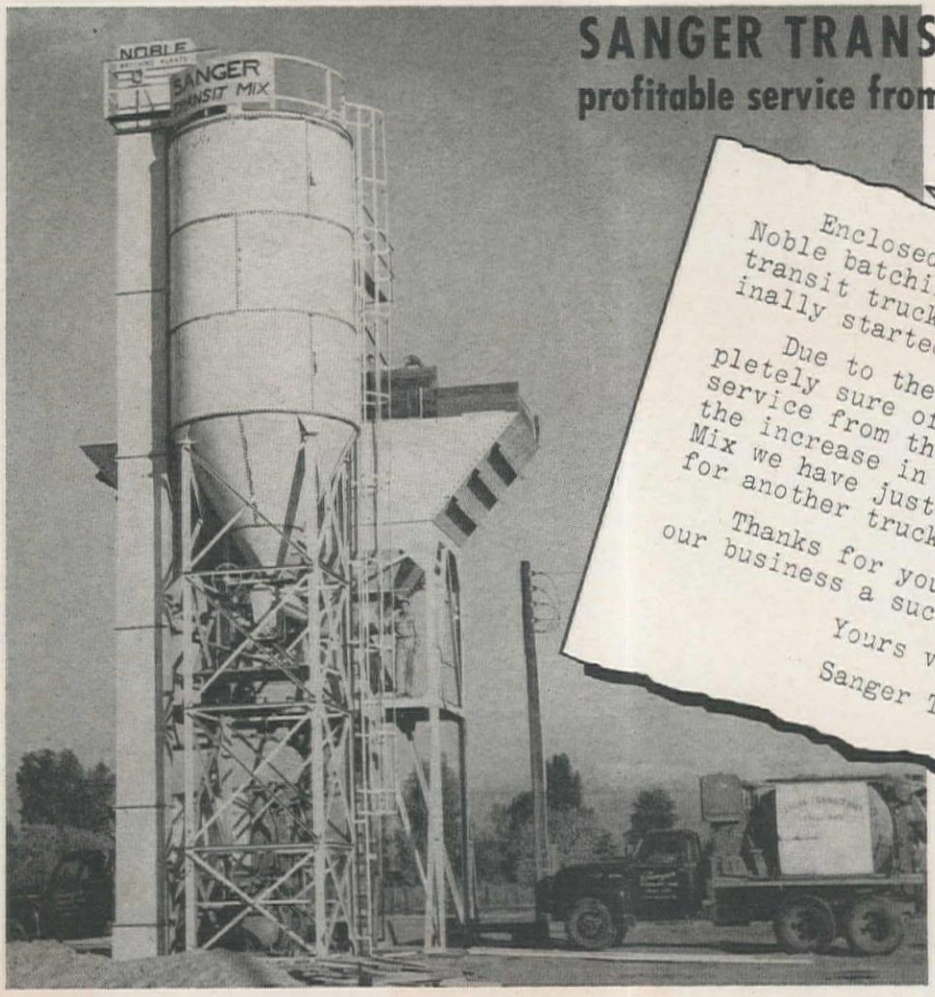
N. C. RIBBLE CO.
Associated with Western States Welding & Press Co.
1304 N. Fourth Street
ALBUQUERQUE, NEW MEXICO

WESTERN MACHINERY COMPANY
760-762 Folsom Street
SAN FRANCISCO, CALIFORNIA

INDUSTRIAL EQUIPMENT COMPANY OF ARIZONA
720 S. 19th Avenue
PHOENIX, ARIZONA

"THANKS for your part in making our business a success"

SANGER TRANSIT MIX gets excellent, profitable service from their NOBLE 104 Batcher



As they wrote us recently . . .

Enclosed is a picture of our Noble batching plant and the two transit trucks with which we originally started operation.

Due to the fact we are so completely sure of continued excellent service from the plant along with the increase in calls for Transit Mix we have just placed an order for another truck.

Thanks for your part in making our business a success.

Yours very truly,
Sanger Transit Mix

SANGER TRANSIT MIX, Sanger, California, operates a Noble 104 Batching Plant with a semi-automatic weigh batcher, 1200 cu. ft. cement silo, and 10"x6" cement elevator.

HERE'S WHY NOBLE BATCHING PLANTS SAVE YOU TIME AND MAKE YOU MONEY...

1. Central cement compartment and discharge method premixes aggregate and cement, reduces mixing time, eliminates dust and cement loss.

2. Double clamshell batch gates assure fast flow and accurate control of all materials—regular aggregates, cinders, etc.

3. One man operation.

4. Easy-operating control levers reduce operator fatigue, and give full view of weigh indicator.

5. Batching of cement and aggregate accurate to 0.2%.

6. All-welded center section includes weigh batcher units with scales and controls in place and connected, for quick low-cost erection and moving.

7. Contractor designed to solve batching and handling problems of operators wanting adaptable, easily-erected plant.

Our engineering department will gladly help you plan your plant layout. No obligation — call on them NOW.

DESIGNERS AND BUILDERS OF

CEMENT AND AGGREGATE BATCHING PLANTS · BULK CEMENT PLANTS · CONVEYORS · ELEVATORS · HEAD FRAMES · SWIVEL DISTIBUTORS AND CHUTES · GATHERING HOPPERS · CALIBRATED WATER TANKS · WATER SCALES · SLIDE GATES · CLAMSHELL GATES · AGGREGATE BINS AND CEMENT SILOS

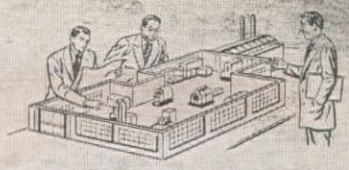
NOBLE CO.

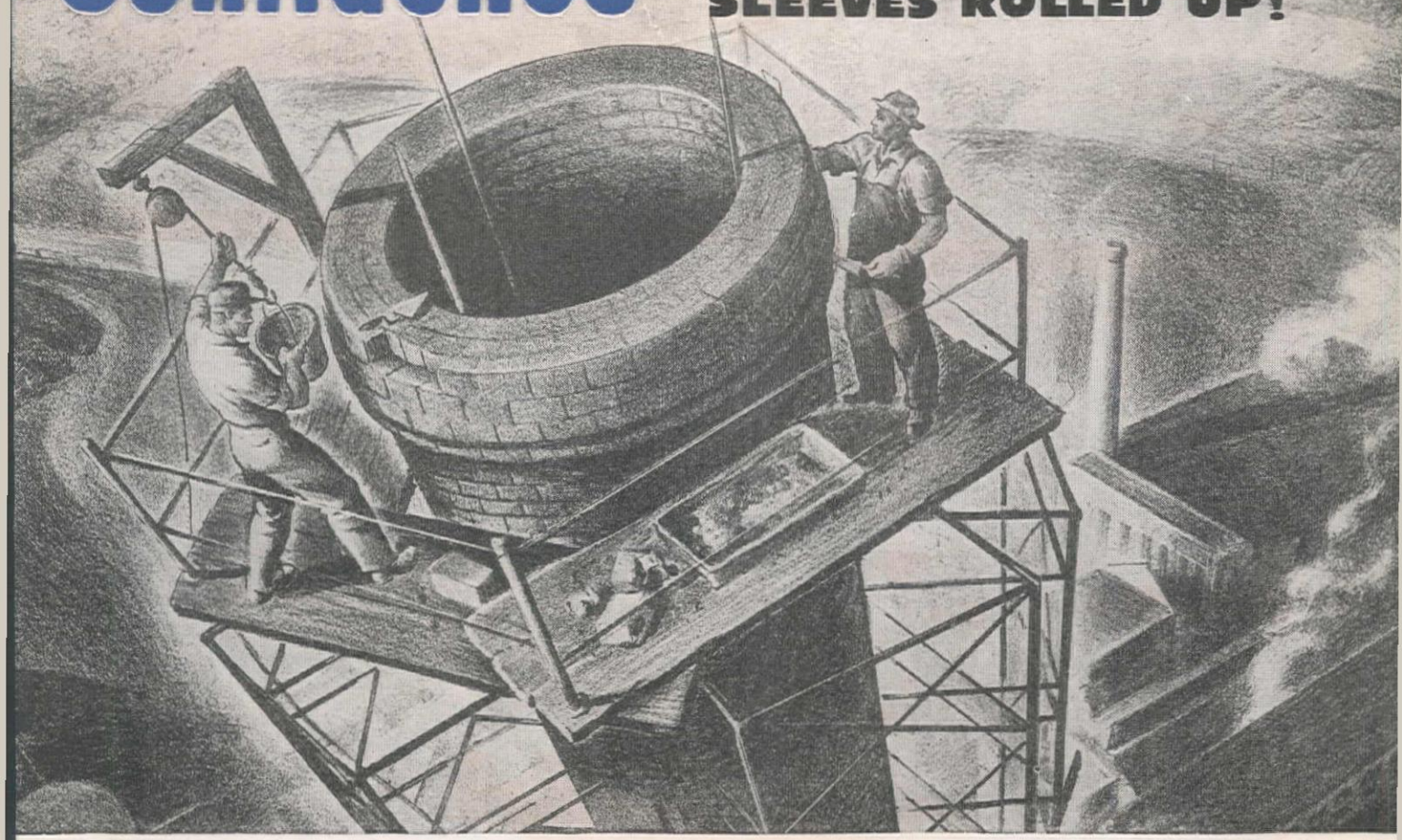
1860 - 7th STREET · OAKLAND 7, CALIFORNIA
TEMPLEBAR 2-5785
4017 MEDFORD STREET · LOS ANGELES 33, CALIF. · ANGELES 2-6455

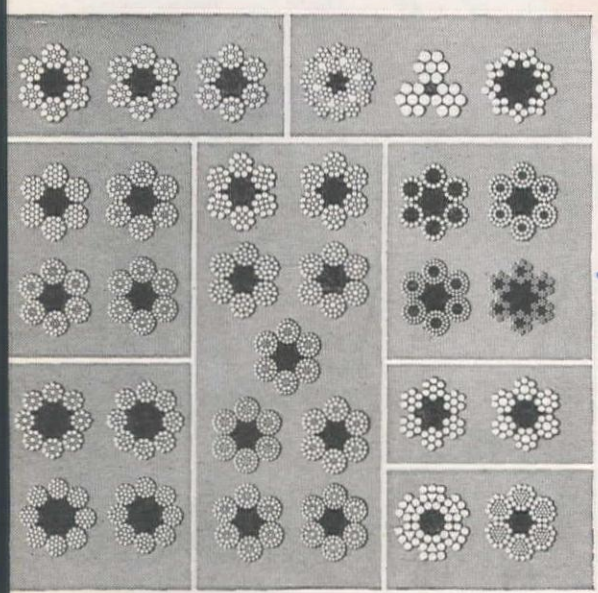
YOUR CHOICE OF MANUAL, SEMI-AUTOMATIC OR FULLY AUTOMATIC PROPORTIONING

A. H. COX & COMPANY, Seattle; ENGINEERED SALES, San Antonio; HALL-PERRY MACHINERY COMPANY, Butte; RAY L. HARRISON CO., Albuquerque; HELD & McCOY MACHINERY CO., Denver; LOGGERS & CONTRACTORS MACHINERY CO., Portland; TATTAN-DOUGLASS EQUIPMENT CO., Oklahoma City; TRI-STATE EQUIPMENT CO., El Paso; TRI-STATE EQUIPMENT CO., Spokane; J. K. WHEELER MACHINERY COMPANY, Salt Lake City.

Confidence- WITH ITS SLEEVES ROLLED UP!







STRAIGHT AND STALWART, every factory stack is a towering symbol of man's faith in the future... industry's confidence in its ability to create and to expand production for better living and a richer world.

With confidence like that, Roebling has pioneered in developing and making an extraordinary range of products indispensable to industry. And the confidence that its products and engineering skill have earned in every industrial field is one of Roebling's most valued assets. Every Roebling employee is striving to safeguard that confidence by making products and rendering services that are of maximum utility to you.

YOU CAN'T GO WRONG WITH THE RIGHT WIRE ROPE

EVERY TYPE of Roebling Wire Rope is right for certain service. But that's not enough... the important thing is that you choose the one rope that's *right* for your own job... the rope with the right balance of strength, flexibility, fatigue and abrasion resistance to give real economy over a long period of use.

Your Roebling Field Man will gladly study your requirements, and you can have full confidence that the rope he recommends will give you top returns per dollar. Whatever type it is, preformed or non-preformed, it will have behind it Roebling's unequalled experience in research, development and manufacturing the finest wire products that can be made.

Call or wire the nearest Roebling branch office.

JOHN A. ROEBLING'S SONS COMPANY OF CALIFORNIA

San Francisco Los Angeles Seattle Portland

A CENTURY OF CONFIDENCE **ROEBLING**

JAR ROEBLING

★ WIRE ROPE AND STRAND ★ FITTINGS ★ SLINGS ★ SUSPENSION BRIDGES AND CABLES ★ AIRCORD, AIRCORD TERMINALS AND AIR CONTROLS ★ AERIAL WIRE ROPE SYSTEMS ★ ELECTRICAL WIRE AND CABLE ★ SKI LIFTS ★ HARD, ANNEALED OR TEMPERED HIGH AND LOW CARBON FINE AND SPECIALTY WIRE, FLAT WIRE, COLD ROLLED STRIP AND COLD ROLLED SPRING STEEL ★ SCREEN, HARDWARE AND INDUSTRIAL WIRE CLOTH ★ LAWN MOWERS

IN THE GRAVEL PITS — ON THE HIGHWAY —

Tire cost is a major item in our type of operation. For that reason we must hold tire expense to the minimum. We do that by using Firestone All Traction Tires. They are money savers.

PAUL GRAHAM, President
Graham Brothers

IT'S Firestone FOR Graham Brothers of

LOS ANGELES, CALIFORNIA

FIRESTONE builds tires for every load, road and condition of service — tires fitted to the job.

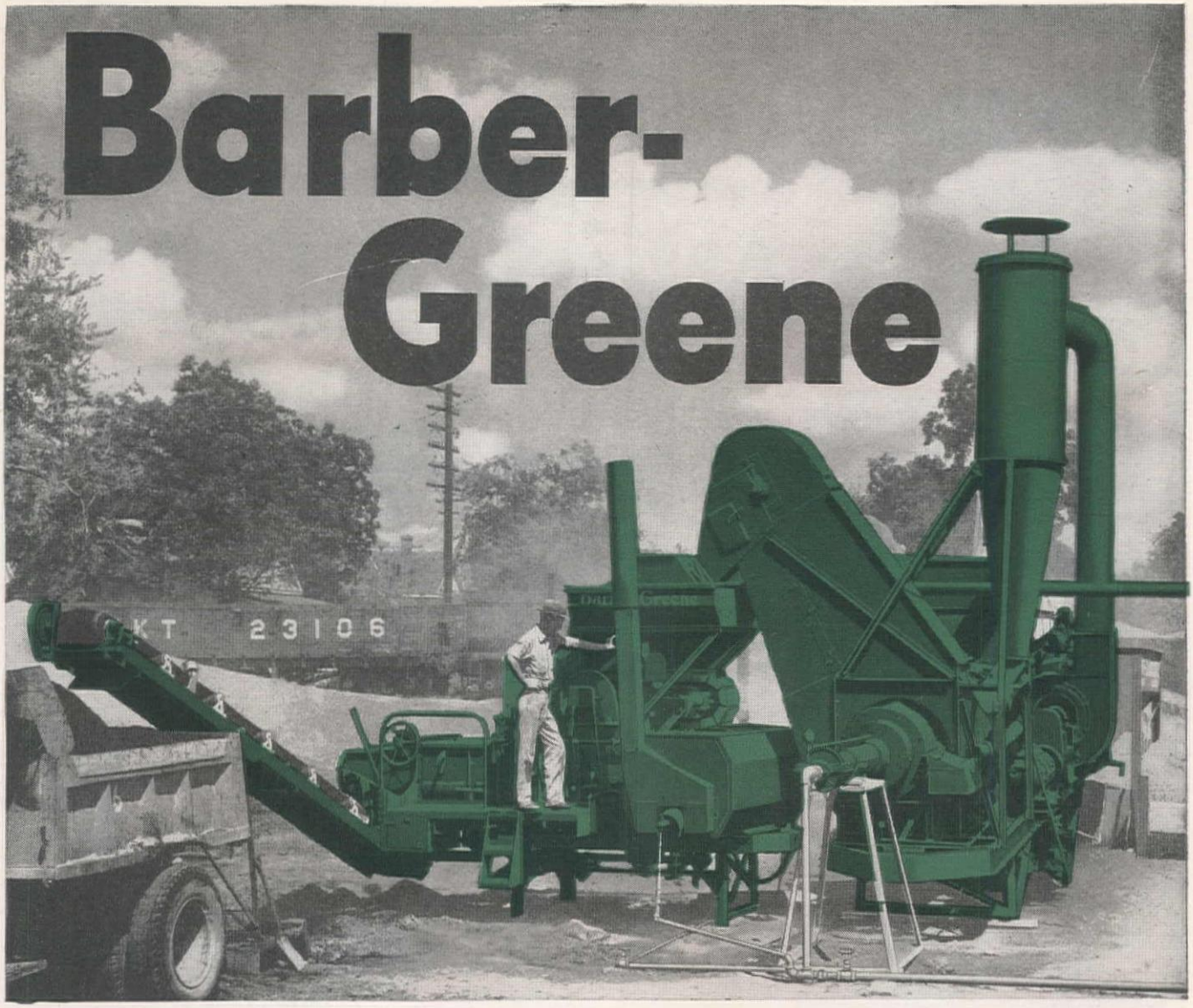
For Graham Brothers in the rock and concrete business in Los Angeles, the tire that fills the bill is the Firestone All Traction. It has the traction for off-the-highway use and the roadability and long life for over-the-highway hauling. And it slashes costs.

The Firestone All Traction will do the same in any hauling operation that demands off-the-highway traction and on-the-highway roadability with long life.

Whatever your hauling job may be you can cut tire costs by equipping your trucks with Firestone Tires fitted for your specific job. Give them a trial. They will prove it.

GROUND GRIP | ROCK GRIP | EARTH MOVER

Firestone



Typical set-up of the Barber-Greene Maintenance Plant. Various combinations to meet your immediate needs may be easily arranged.

This *Small* Bituminous Mixing Plant Does a *BIG* Job!

Here's a complete, easy-to-operate, small bituminous mixing plant! It is specifically designed for maintenance and repair work, small road building projects and a variety of other surfacing jobs. The B-G Maintenance Plant will handle any type of mix, and its capacity is remarkable, considering its size and portability.

The B-G Maintenance Plant is truly portable and easily erected. Small enough to operate at low cost on maintenance and general repair work, it is still large enough to handle small construction projects. It operates on the same principles as the larger Barber-Greene Central Plant, measures the correct amount of aggregate and bitumen, thoroughly mixes them and discharges the mix into trucks.

It consists of two basic units—the 840 Mixer and 830 Aggregate Dryer. Each unit is equipped with a towing hitch and pneumatic tires to trail smoothly behind your truck when going from job to job. A complete line of auxiliary equipment available including Reciprocating Feeder, Bins, Dust Collector, etc. For illustrative literature, write Barber-Greene Company, Aurora, Illinois.

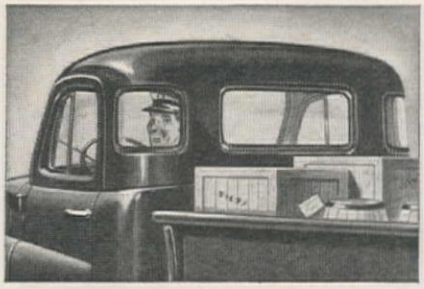
BARBER-GREENE COMPANY · AURORA, ILLINOIS

Constant Flow Equipment

LOADERS PERMANENT CONVEYORS PORTABLE CONVEYORS COAL MACHINES BITUMINOUS PLANTS FINISHERS DITCHERS

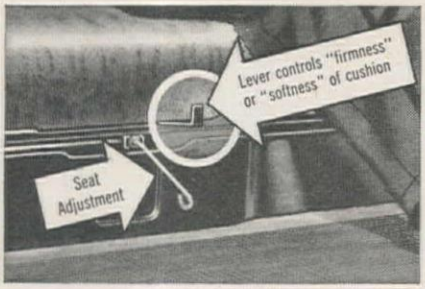
FOR SALE BY: Brown-Bevis Equipment Co., Los Angeles 11, Calif.; Columbia Equipment Co., Spokane, Wash., Seattle, Wash., Boise, Idaho, Portland 14, Ore; Wilson Equipment & Supply Co., Cheyenne, Wyo., Casper, Wyo.; Contractors Equip. & Supply Co., Albuquerque, N. Mex.; Ray Corson Machinery Co., Denver 9, Colo.; Jenison Machy. Co., San Francisco 7, Calif.; Western Construction Equip. Co., Billings, Mont., Missoula, Mont.; Kimball Equipment Co., Salt Lake City 10, Utah; State Tractor & Equipment Co., Phoenix, Ariz.

Much That's New...and "Job-Rated", too!



1. More Safety from the All-'Round Vision of New "Pilot-House" Cabs!

Note the tremendously increased *vision* of new Dodge cabs. Windshields and windows are higher and wider. New rear quarter windows are available, adding still more to vision and to safety. You get true "Pilot-House" vision in all directions. They are the safest cabs ever built.

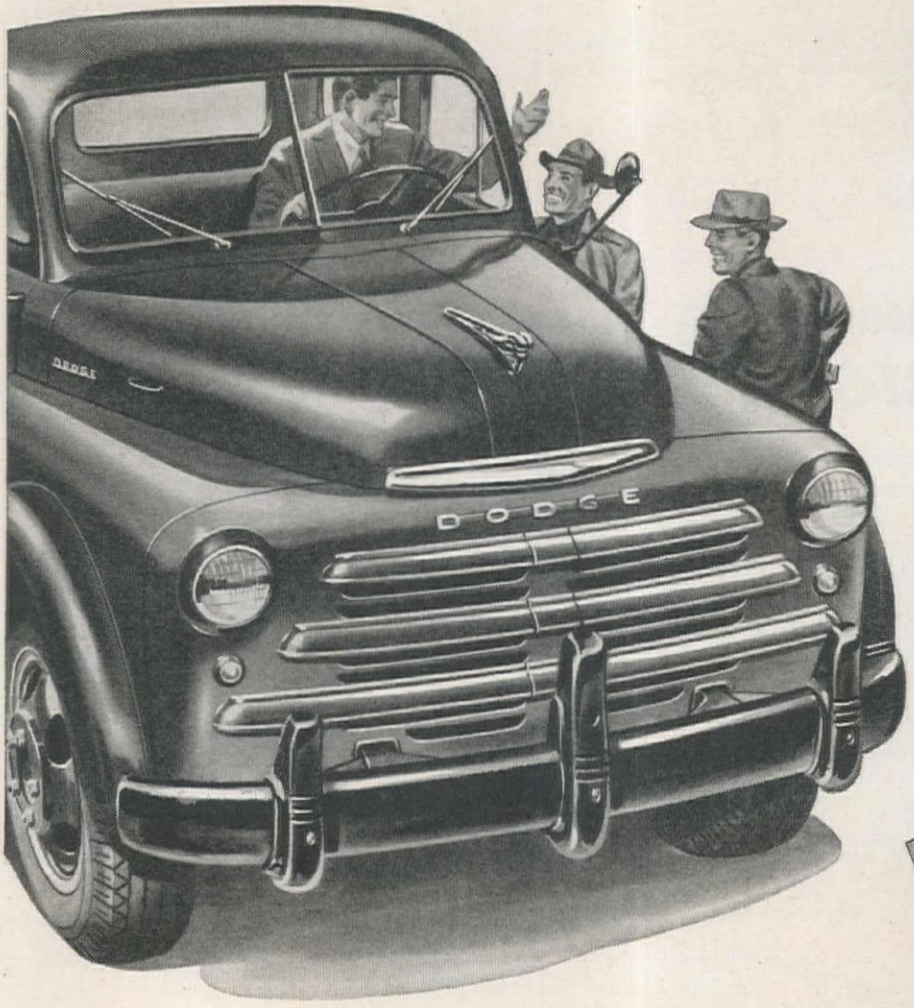


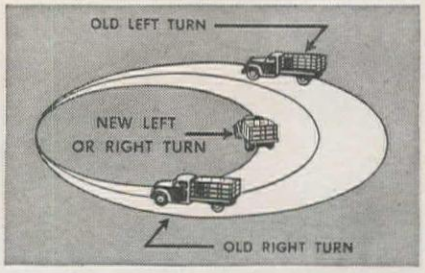
2. More Comfort from New Adjustable "Air-O-Ride" Seats!

"Air-O-Ride" seats give the kind of comfort you want. You may have a "soft" seat . . . or you can ride on a "firm" or "medium" seat. You control cushion "give" by a lever at the bottom of the front seat. Seven full inches of seat adjustment provide the right legroom for every driver.

3. More Safety . . . More Comfort . . . from New All-Weather Ventilation!

Whether the thermometer is ten below or a hundred above—you're *comfortable!* That's because of the availability of an ingenious combination of fresh air intake, newly designed hot water *truck* heater, with powerful fan and defroster tubes, vent windows and cowl ventilator.





4. Easier Handling because of New Chassis Design!

By moving the front axle back, *under* the frame, and moving the engine forward, Dodge has greatly improved maneuverability and weight distribution. Also, a wider front axle tread plus a new type of cross steering permit a full 37° turning angle to left or right.

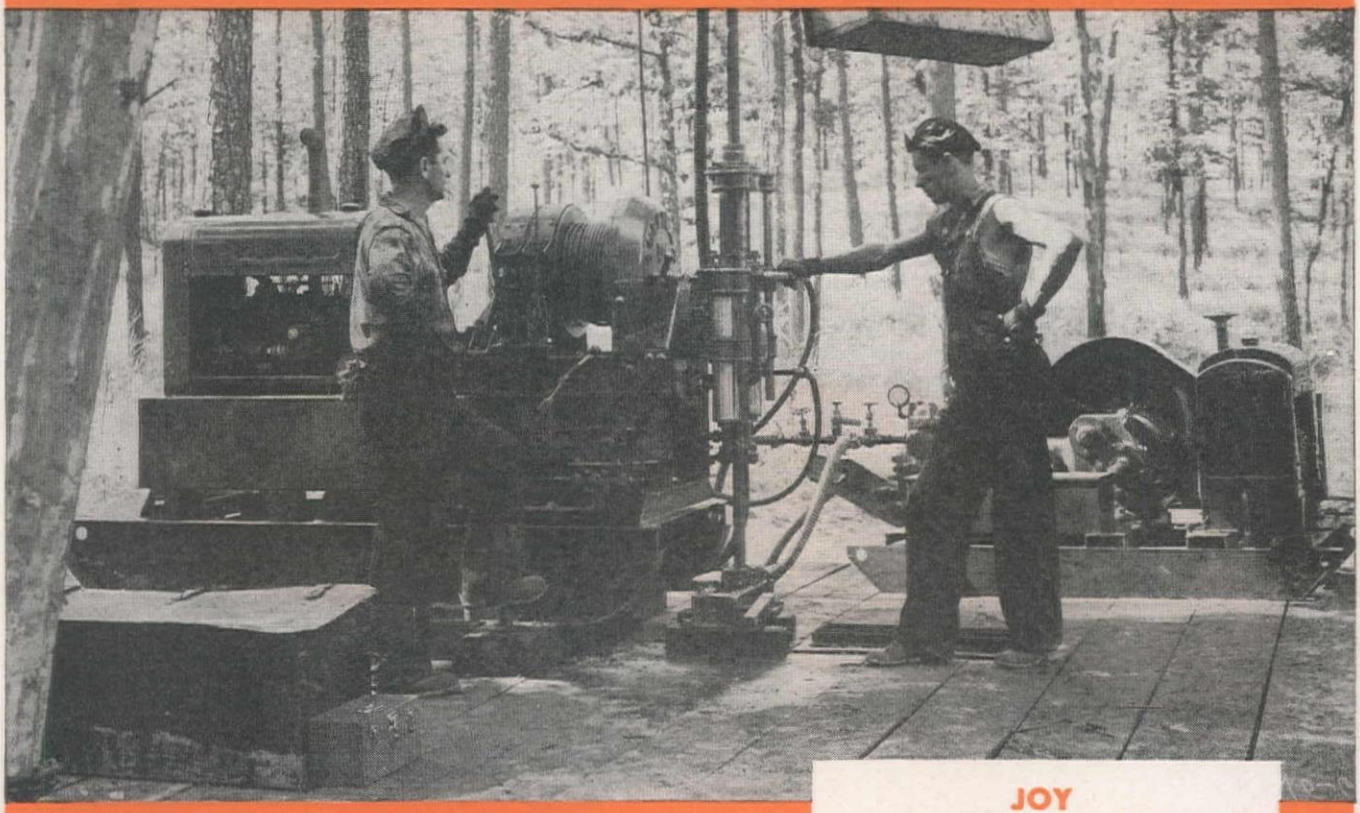
5. . . . And Your New Dodge Truck will be "Job-Rated," too!

Every unit of your truck . . . from engine to rear axle . . . will be "*Job-Rated*" for economy, dependability, performance, and long life. The 248 basic chassis and body models are engineered and built for gross vehicle weights up to 23,000 lbs., and for gross train weights up to 40,000 lbs

NEW
DODGE
"Job-Rated"
TRUCKS
FIT THE JOB . . . LAST LONGER

COMPLETE CORE DRILLING SERVICE

for foundation testing, prospecting and all types of exploratory work



World-wide service!

CORE DRILLING by Contract

Whether you wish to prove your property's value, prospect new fields or determine foundations, experienced Joy crews are prepared to make test borings for you . . . quickly and economically . . . any place in the world.

Consult a Joy Engineer or write for complete details

JOY 22-HD CORE DRILL

Conservatively rated at 1750 ft. capacity with "E" rods, the 22-HD is built for drilling in all formations. Compact design and modern lightweight alloy construction assure its portability.

SUL-SET DIAMOND CORE BITS

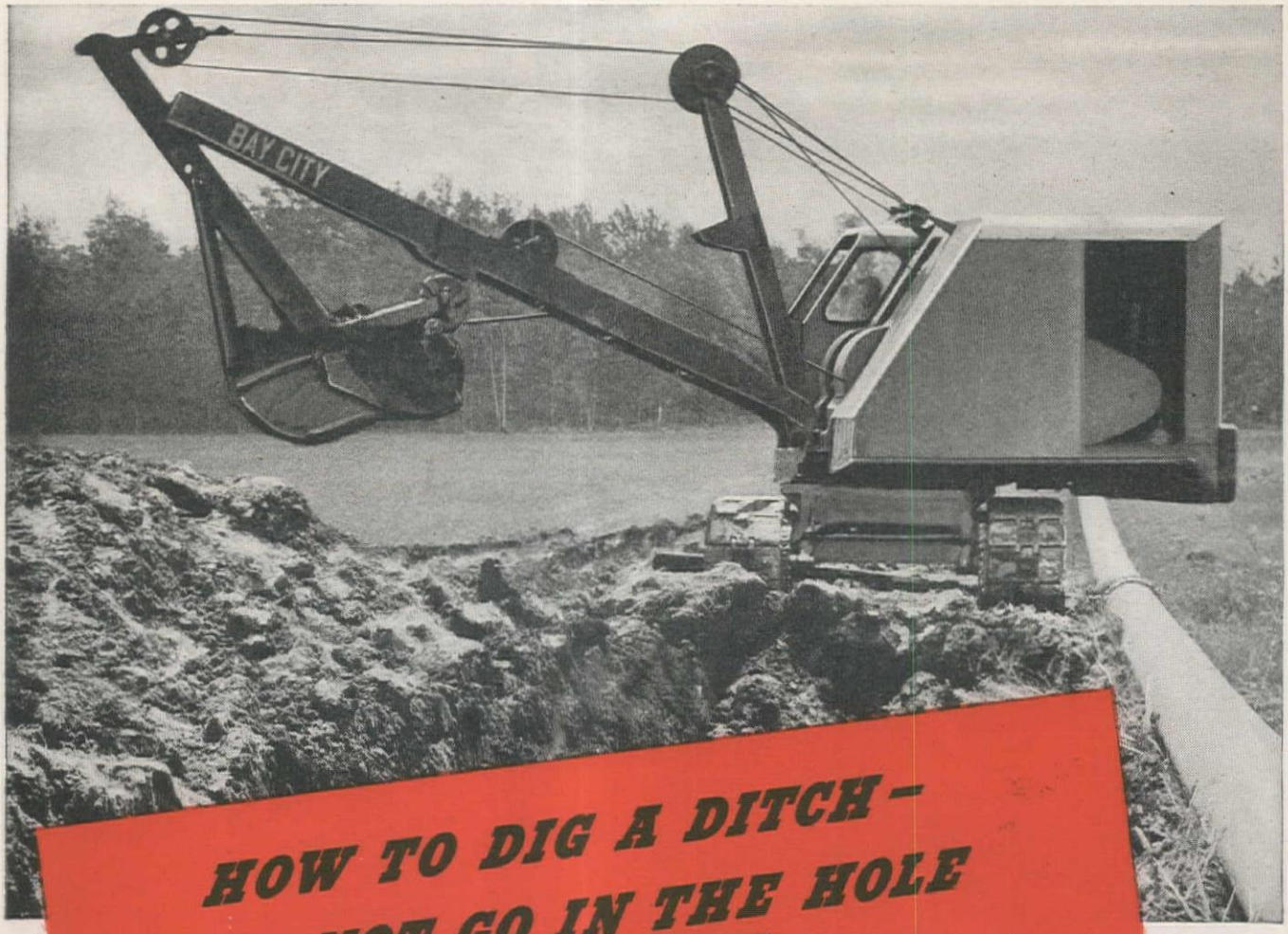
The ridge design of these bits allows faster drilling speed and produces unusually accurate cores.

W&D C1304

SULLIVAN DIVISION

JOY MANUFACTURING CO.

GENERAL OFFICES: HENRY W. OLIVER BLDG., PITTSBURGH, PA.



HOW TO DIG A DITCH— AND NOT GO IN THE HOLE

Yager and Sons, Beaverton, Michigan, call the 3-cylinder GM Series 71 Diesel that powers this shovel "just about the best power we've ever used." Inset shows Mr. Fay Yager, in charge of the shovel operation, who says, "You fellows just don't boast enough about that GM Diesel engine."

Shown here is a General Motors Diesel-powered Bay City ¾ yard shovel. It's doing the toughest part of a pipe-trench job—mile after mile of 6′ by 12′ trench—cutting through wet sand, swamp mud, pulling stumps, digging in the roughest kind of terrain.

Taking jobs like this in stride is everyday work for GM Diesel-powered equipment. The 2-cycle GM Diesel gives instant response to widely fluctuating power demands, operates on low-cost fuel, and delivers long, economical service.

No wonder so many operators rely on GM Diesel power to help them trim costs on close-figured contracts. You, too, will find it pays to specify GM Diesels for repowering old equipment or when buying new. Write today for complete details.

DETROIT DIESEL ENGINE DIVISION

DETROIT 28, MICH. • { SINGLE ENGINES . . Up to 200 H. P. / MULTIPLE UNITS . . Up to 800 H. P.

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

Evans Engine & Equipment Co.
SEATTLE 9, WASH.

Cate Equipment Co.
SALT LAKE CITY, UTAH

Fred M. Viles & Company
SPOKANE 8, WASH.

Mountain Tractor Co.
MISSOULA, MONT.

Gunderson Bros. Equipment Corp.
PORTLAND 9, ORE.

Olson Manufacturing Co.
BOISE, IDAHO

Capitol Tractor & Equipment Co.
SACRAMENTO, CALIF.

Anderson-O'Brien Co.
LOS ANGELES 21, CALIF.

JAEGER ANNOUNCES a fundamental improvement in the finishing of concrete slab

type "X" diagonal screed finisher

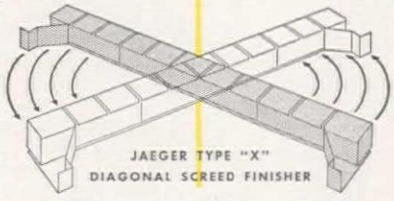
a revolutionary mass-production, labor-saving tool to work behind modern mass-production pavers

solves finishing problem on pitched slab and curve elevations: A true power trowel — where slab is pitched you simply set the rear screed at whatever angle is needed to carry the material uphill and compact it solidly against the upper form. Eliminates or greatly reduces carry-back; you save one to two shovelers' wages on every job.

more accurate than any transverse finisher: Because the rear screed operates diagonally to the front screed, it always meets the material at a different point. High spots left by the front screed are sliced off, low spots are filled in, producing a smoother surface than is possible with any one-direction finisher and with less hand work and equipment needed behind the machine.

greater capacity to match any paver: Because the rear screed works at an angle against the final roll of material and at a wide range of speeds, *all independent of traction*, stiff mixes are more easily finished without tearing. Helps to eliminate extra passes, easily keeps pace with dual drum pavers on half-width as well as full-width slab.

job-tested for 18 months — now available for 1948 work: 10-15 and 20-25 ft. widths with quick crown change screeds standard. See your Jaeger distributor immediately or write for Specification FX-8.



Front Screed is Transverse, Rear Screed is Diagonal:

Hand wheel, on operator's platform, quickly swings pivoted screed in either direction to operate at whatever angle best suits the work.

- EDWARD R. BACON CO. — San Francisco 10, Calif.
- SMITH BOOTH USHER CO. — Los Angeles 54, Calif. and Phoenix, Ariz.
- A. H. COX & CO. — Seattle 4, Wash.
- NELSON EQUIPMENT CO. — Portland 14, Ore. and Twin Falls, Ida.
- WESTERN MACHINERY CO. — Salt Lake City 13, Utah and Denver 2, Colo.
- ANDREWS EQUIPMENT SERVICE — Spokane 9, Wash.
- CENTRAL MACHINERY CO. — Great Falls, Mont.
- TRACTOR EQUIPMENT CO. — Sidney, Mont.
- WORTHAM MACHINERY CO. — Cheyenne, Wyo. and Billings, Mont.
- HARDIN & COGGINS — Albuquerque, N. M.
- MILES CITY EQUIPMENT CO. — Miles City, Mont.

The Job

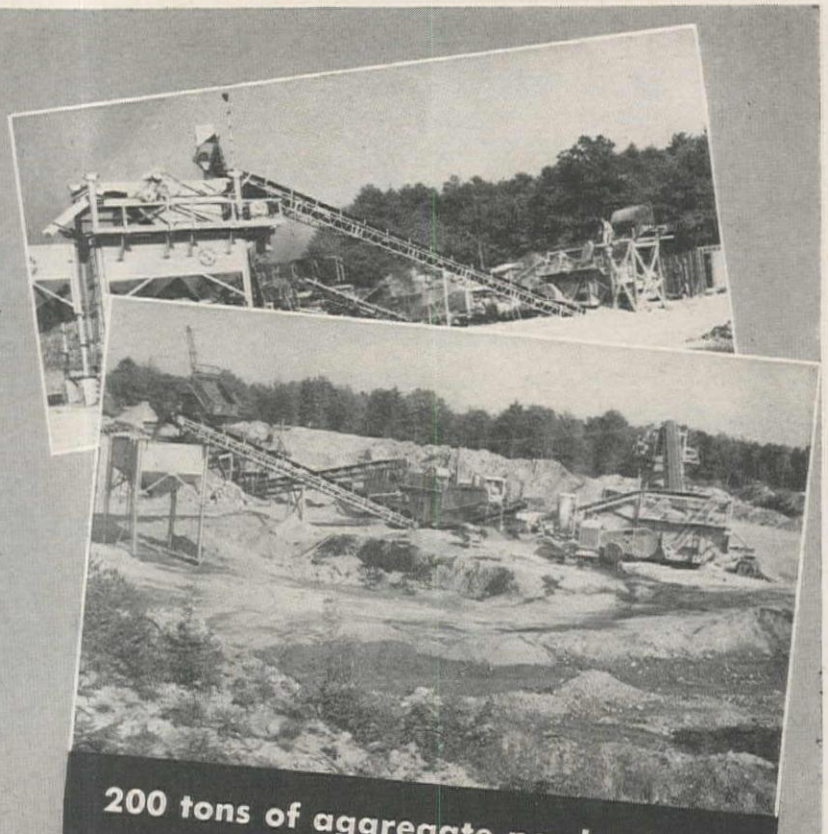
The Maine Turnpike

The Equipment

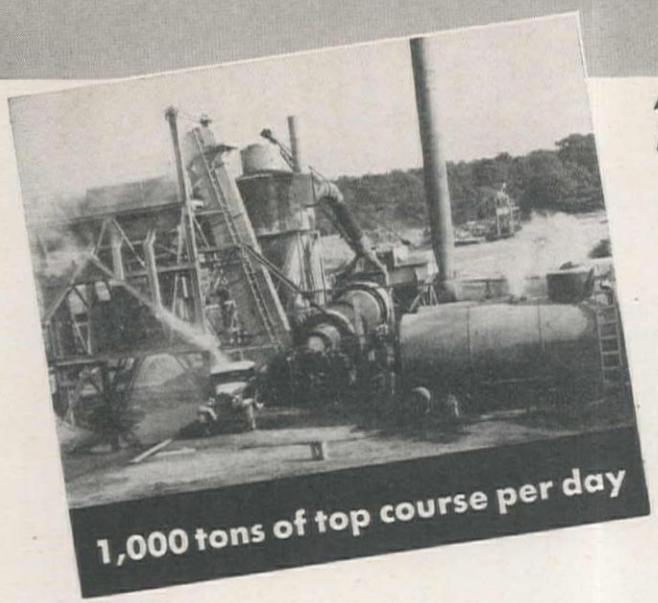
2 Cedarapids Unitized Plants
Cedarapids Model "E" Asphalt Plant

The Contractor

B. Perini & Sons, Inc.
Framingham, Mass.



200 tons of aggregate per hour. . .



1,000 tons of top course per day

PRODUCING the aggregate and mixing the top course of asphaltic concrete for the south half of the Maine Turnpike was the job assigned to two Cedarapids Unitized Plants and a Cedarapids 4,000 lb. Model "E" bituminous mixing plant. And right on schedule the job was done by the Perini organization.

On job after job, you'll find that contractors who know construction equipment best base their bids on Cedarapids production and get the awards. Whether you need 50 tons of aggregates per hour or 200—or more—there's a Cedarapids plant that will meet your requirements. When it comes to black top there's a Cedarapids bituminous mixing plant to meet the most exacting specifications.

And, best of all, you'll know that you'll get your jobs done on time and make a profit because of their high production, and very low maintenance costs.

On your next job use Cedarapids equipment —you'll be way ahead. When you buy aggregate producing or bituminous mixing equipment — buy the best — buy Cedarapids.

The Iowa Line

of Material Handling Equipment is Distributed by

HOWARD-COOPER CORP., Seattle, Washington, Portland, Eugene, and Central Point, 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 and Redding, California; ARIZONA-CEDAR RAPIDS CO., Phoenix, Arizona; R. L. HARRISON CO., INC., Albuquerque, New Mexico; SIERRA MACHINERY CO., Reno, Nevada.

Cedarapids

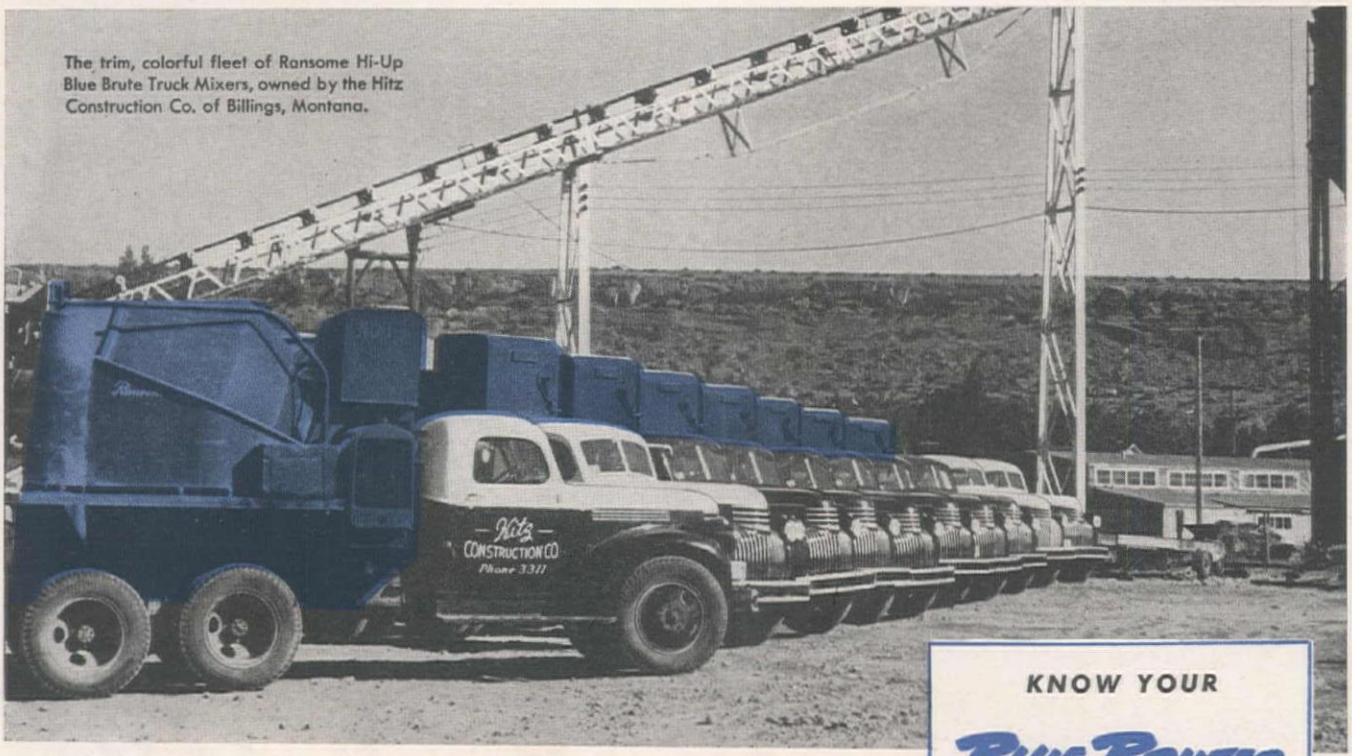
Built by IOWA

PRODUCT OF IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

HOW TWO HI-UPS BECAME A FLEET...



The trim, colorful fleet of Ransome Hi-Up Blue Brute Truck Mixers, owned by the Hitz Construction Co. of Billings, Montana.

Any time you want the real low-down on truck mixer performance, go to a fleet-owner! Such as Mr. Adam Hitz of the Hitz Construction Co., prominent in the present big expansion program around Billings, Montana, who writes:

"We are building business on service and quality of materials. Blue Brute Hi-Up Truck Mixers are a large factor in giving this service."

Like many another ready-mix producer, the Hitz Co. chose Blue Brute Hi-Ups for advanced features such as: Engineered flexibility, eliminating operating strains . . . Ransome's exclusive mixing action . . . quick-charging hopper with non-jamming sealing door . . . simplified, trouble-free water system . . . plus simple, clean design that provides maximum accessibility to working parts and facilitates routine servicing.

And here's action that speaks louder than words. The Hitz Co., starting in 1946 with *two* Hi-Ups (serviced by a Ransome 56-S Big Mixer) now operates *a fleet of nine* Blue Brutes — conclusive, on-the-job proof of the Hi-Up's exceptional dependability and economy . . . To learn more about the many desirable features of these Blue Brute Hi-Ups, contact your nearby Worthington-Ransome Distributor, or write for Bulletin 221. R8-1

KNOW YOUR

BLUE BRUTES

Your Blue Brute Distributor will be glad to show you how Worthington-Ransome construction equipment will put your jobs 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.

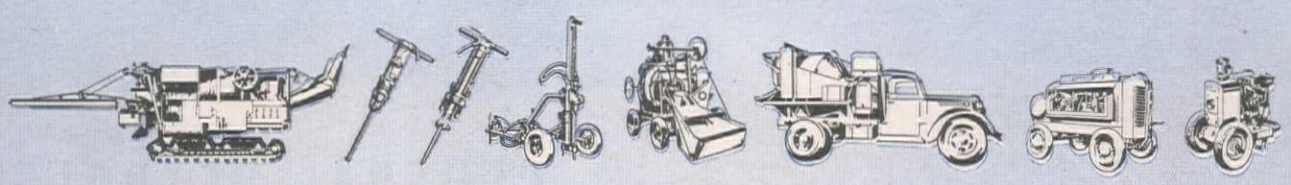
WORTHINGTON

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

Distributors in all principal cities

NATIONAL READY MIXED CONCRETE ASSOCIATION NRMCA

BUY BLUE BRUTES



IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

These Operators Know When

HOW G. P. SERVICE SAVES YOU MONEY

Performance of equipment is materially improved by specialized services of G. P. engineers. These trained, experienced men will confer with your job superintendent to set up a program, which includes such specific services as these:

- **Equipment Survey** — Analyze equipment and operating conditions.
- **Service Intervals** — Set up schedules for lubrication and drains.
- **Product Recommendation** — Insure use of correct products at specified periods.
- **Reduced Inventory** — Select smallest number of products necessary for all equipment.
- **Storage and Handling** — Recommend storage facilities and handling equipment best suited.
- **Deliveries** — Insure uninterrupted schedule of lubricant deliveries.

GENERAL PETROLEUM

Servicing at lunch time.

and How to Lubricate . . .

Equipment operators on this Ridge Route Road job for Winston Bros. Company know *when* and *how* to lubricate each piece of machinery. This schedule was set up in advance for the entire year the job will take.

The first step was a lube survey by trained General Petroleum engineers. From this survey were developed recommendations for oil drains and lube schedules, based on the equipment and the nature of the job.

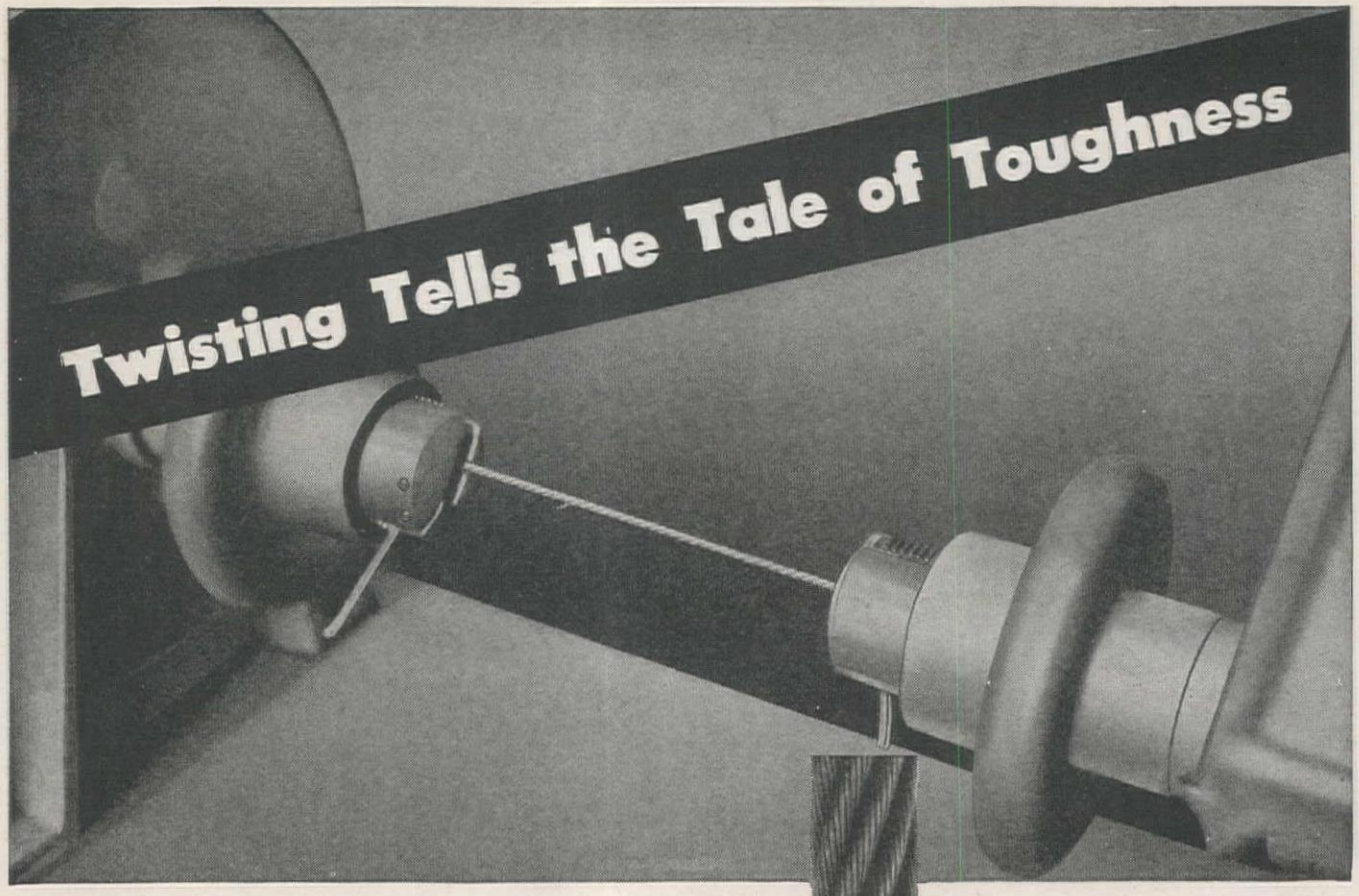
There was a bonus for Winston Bros. Company from this survey, too, as a number of helpful operating suggestions were worked out by G. P. men.

Only Mobil fuels and lubricants are used on this contract, which involves four miles of construction on Highway 99, north of Castaic, California.

In addition to cats, dozers, blades and shovels, Winston Bros. Company operates a rock crusher on the job. Jack Yount is Construction Manager, Jack Adams is Job Superintendent, and Les Croft is Master Mechanic.

CORPORATION · CONTRACTOR SERVICE

Mobiloil
SOCONY-VACUUM



Here we see an 8" piece of rope wire being twisted on its own axis. The revolutions necessary to break the wire are counted and only those coils are accepted which test at least 10% above American Petroleum Institute specifications for wire rope. In addition to being an indication for toughness, the torsion test reveals whether the wire is free from steel defects such as seams and cups.

A routine test? Yes, but with higher standards. And every coil of wire on both ends must pass this and countless other tough tests before acceptance for use in making Wickwire Rope. It's these tests, coupled with over 125 years of wire-working know-how, that are your assurance of the utmost in performance, safety and long rope life when you use Wickwire Rope.

Wickwire Distributors and Wire Rope engineers throughout the country are ready to help solve your wire rope problems, and to provide prompt delivery of the rope you need from strategically located warehouse stocks. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY *Pre*formed.

THIS 82-PAGE BOOK ON WIRE ROPE IS FREE. WRITE FOR YOUR COPY TODAY!

Thousands of wire rope users have found that the information packed in the pages of "Know Your Ropes" has made their work easier. It's full of suggestions on proper selection, application and usage of wire rope. It's easy-to-read and profusely illustrated. For your free copy, write —Wire Rope Sales Office, Wickwire Spencer Steel, Palmer, Mass.

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A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

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PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

One-man gravel getter...

WITH TWO-FISTED PUNCH

ADAPTABLE to the operating of many kinds of auxiliary equipment, "Caterpillar" Diesel Tractors keep finding more and more jobs to do—*better, quicker, cheaper.*

With two such valiant helping hands ("Caterpillar" matched Bulldozer and mounted Hystaway dragline crane), the D7 in these California scenes makes gravel digging and truck loading so easy that little experience is required to man the controls. In fact, the operator on this job had never handled any type of shovel or dragline before the day these photographs were taken. The rig is also used for removing overburden.

Users everywhere say: Where there's time to be saved, more work to be done, greater profits to be made, "Caterpillar" is the power and equipment that's most certain to "deliver the goods."

• *The standard model D7 Tractor is priced (without Bulldozer and Hystaway) at $7960, F.O.B. Peoria, subject to change without notice.*

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

CATERPILLAR

REG. U. S. PAT. OFF.

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MOTOR GRADERS
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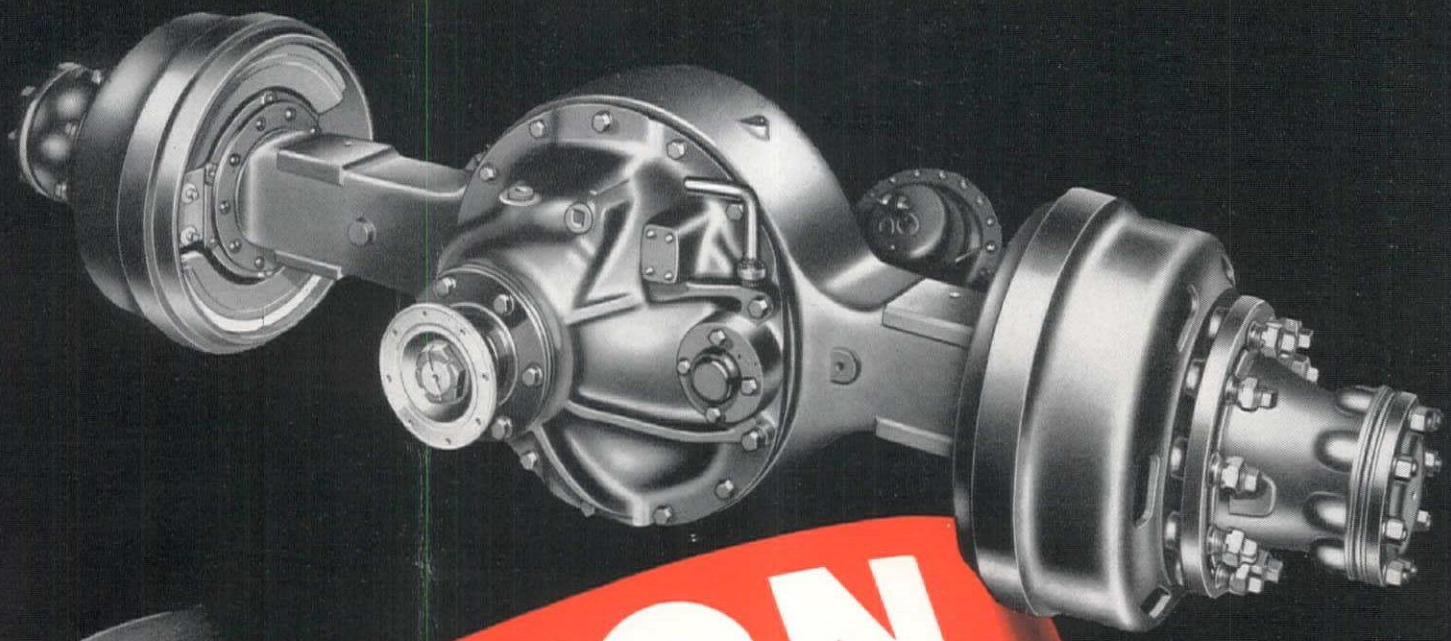

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MORE THAN ¾ OF A MILLION EATON 2-SPEED AXLES IN TRUCKS TODAY

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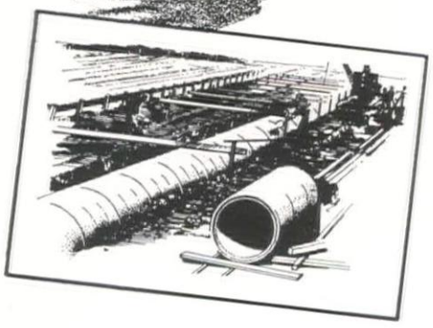

If it's a problem of controlling, supplying, conserving or disposing of water, California Associated Concrete Pipe Manufacturers can give you the answer.

Whether it's small or a gigantic system of drainage for flood control or reclamation, a sanitary sewer for the largest or smallest city, or culverts under light or heavy traffic and fills, there's a backlog of performance in durable concrete pipe that's yours for the asking.

Thousands of miles of plain and reinforced concrete pipe, used under every conceivable condition, including irrigation systems and farm drainage, testify to its better efficiency, longer life and greater economy.

Concrete pipe is manufactured from local materials by local labor and capital. It's **made right** in your own district. Write for the names of your nearest manufacturer-members of

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. . . no waste space, compressor and engine coupled into a single, rigid, permanently aligned unit . . . balanced to reduce wear and increase efficiency!

Lightweight

. . . Portables designed for quick handling to and from the job, stationary units vibrationless.

Easy to start

. . . Just push the built-in electric starter, and the Compressor starts . . . to give you a continuous amount of air.

For these reasons—compactness, lightweight, ease of starting—users of Schramm Air Compressors have said they *like* to operate them.

Other features, however, enter into the usefulness of Schramm. There's 100% water cooled feature, allowing you to operate Schramm perfectly both summer and winter; mechanical intake valve, forced feed lubrication, to mention a few.

Schramm features make them the Air Compressors ideal for your many jobs . . . and the reason they're specified North, East, South and West. Write today for full data.

TOOLS *for the* JOB

Schramm Inc. also has a complete line of Pneumatic Tools to offer and recommend for operation by their Compressors.

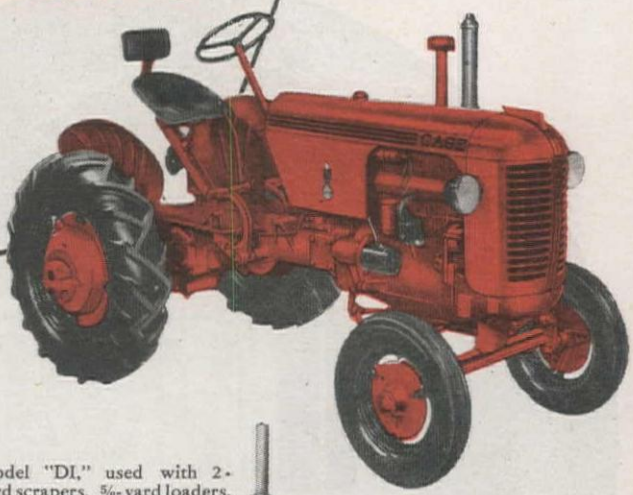
These include Rock Drills, Paving Breakers, Trench Diggers, Clay Spades, Backfill Tampers, Tie Tampers, Sheeting Drivers, Demolition Tools, Chain and Circular Saws.

Write for bulletins and prices.

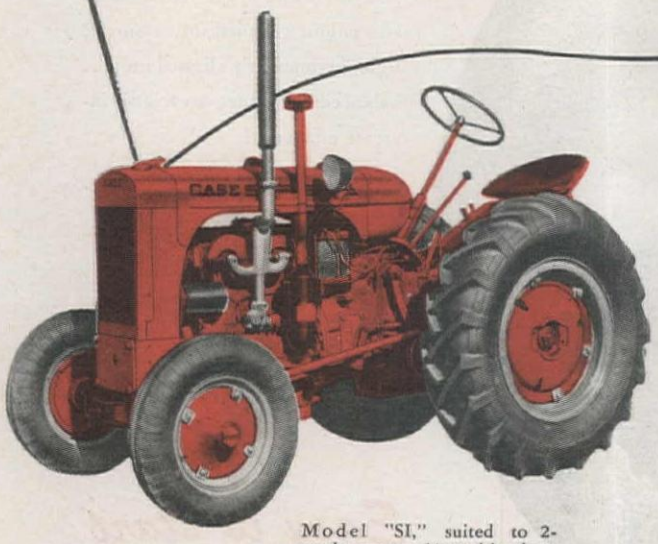
SCHRAMM INC.

THE COMPRESSOR PEOPLE • WEST CHESTER • PENNSYLVANIA

The More You Look at Tractors The Better a CASE Looks



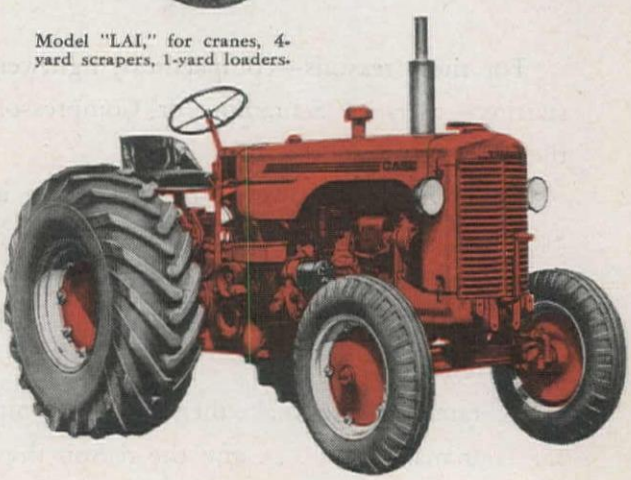
Model "VAI," favorite for highway mowing, sweeping.



Model "SI," suited to 2-yard scrapers, ½-yard loaders.

Model "DI," used with 2-yard scrapers, ⅝-yard loaders.

Model "LAI," for cranes, 4-yard scrapers, 1-yard loaders.



● Your first glimpse gets the sense of something like a thoroughbred—lithe, compact, solid. In action you find a Case tractor like a blooded bridle-mount—an engine with energy eager to go, yet tender-bitted in response to a touch of throttle or steering wheel. You find a clutch that is gentle, yet unfaltering.

When you look at records of work done, you see why men who keep count of man-hours feel kindly toward Case tractors. And when you dig into cost sheets you see why Case ENDURANCE gladdens the hearts of maintenance men.

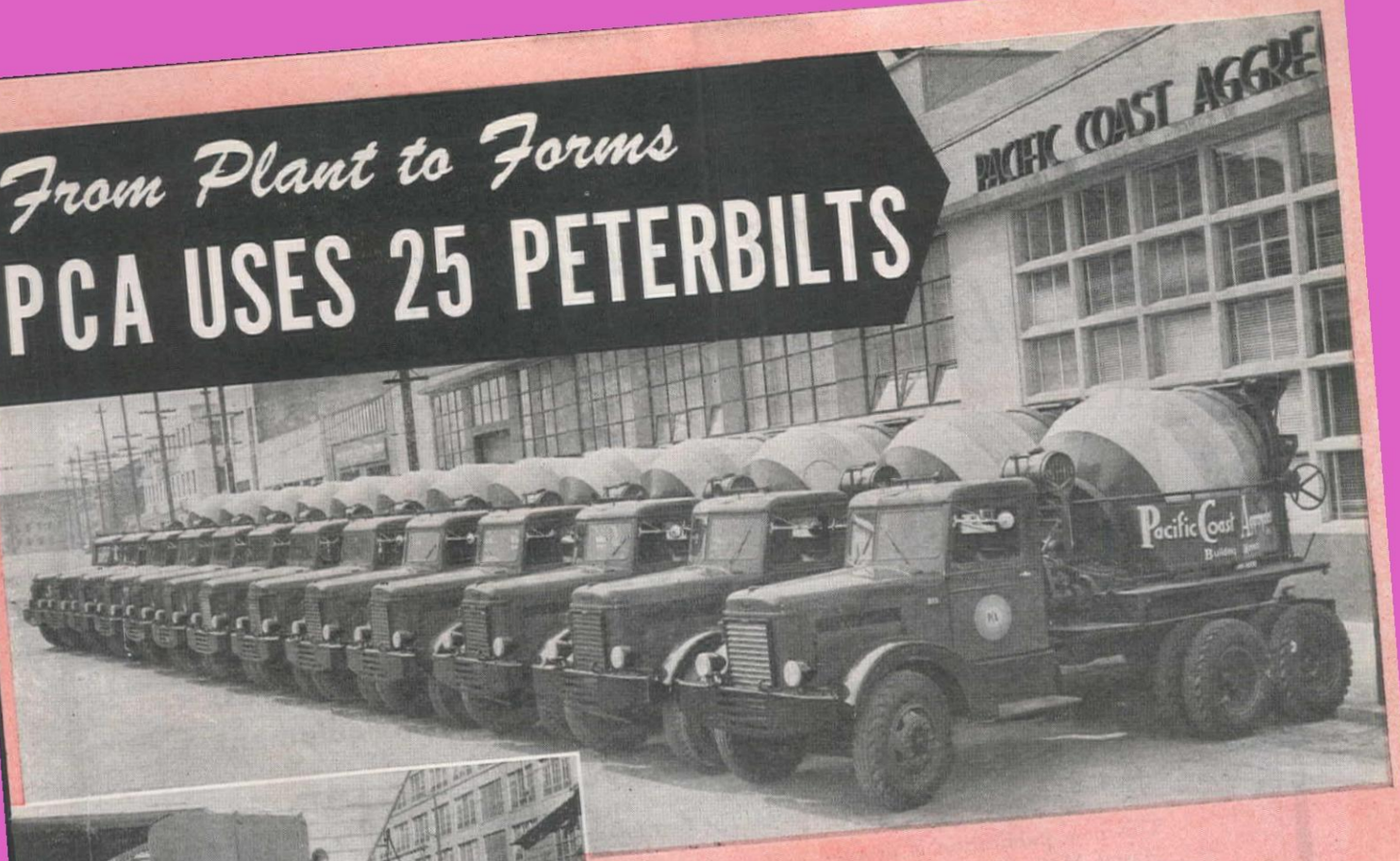
Case Industrial Tractors are built in four basic sizes. With varied wheel and tire equipment they cover a weight range from 2500 to 10,000 pounds, fit all conditions of footing. For full information on tractors and related equipment, call your Case industrial dealer.

Your Case industrial dealer is strategically located to serve you conveniently, staffed and stocked to serve you well. Besides Case tractors and engine units he offers a well chosen line of related equipment such as tractor-mounted cranes, loaders, winches, snowplows, highway mowers and rotary brushes. Specializing in the power and equipment problems that prevail in your area, he has broad experience that can be helpful to you in the choice, use and care of equipment. J. I. Case Co., Oakland, Los Angeles.

CASE

From Plant to Forms

PCA USES 25 PETERBILTS



Pacific Coast Aggregates, Inc., largest operator in the building materials industry on the Pacific Coast, have a fleet of 25 PETERBILT DUAL DRIVES with which they deliver ready-mixed concrete from their plants directly to the forms where it is poured.

In this type of hauling, motor trucks must not only be sturdily built to carry the heavy load of concrete and mixing machine, but the truck must have the power and traction to take the load wherever the forms may be located.

Sometimes they must go up over the curb onto property at a much higher elevation than the street level. Sometimes they must go into an excavation to pour a concrete floor. They must be prepared to make delivery regardless of grade or ground conditions. That means plenty of power—plenty of traction. They achieve that result with PETERBILT DUAL DRIVES.

Peterbilt Motors Company

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Master Mechanic

A quarterly magazine devoted to the Mechanical Features, Proper Maintenance and Repair of Construction Equipment

The publishers of *Western Construction News* take pleasure in announcing the new publication, MASTER MECHANIC. It will be issued on a quarterly basis, in the months of March, June, September and December. The first issue will be in March, 1948.

This new publication is devoted exclusively to the interests, methods and problems of Master Mechanics and those men charged with the responsibility of the proper selection, maintenance and repair of equipment owned and operated by construction firms, utilities and the public works departments of federal, state, county and municipal governments.

MASTER MECHANIC will bring to these readers carefully selected material that they can get from no other source: Information on lubricants, welding procedures, hard facing, accessories and mechanical attachments that lead to better equipment performance. A considerable amount of space will be devoted to the mechanical features of new equipment or new models, with details of design that the manufacturer has developed to reduce maintenance or repair problems. Information on new materials and replacement parts will be given.

The editors of MASTER MECHANIC, engineers with many years of practical, field-experience, will uncover and report on short-cuts, improvisions and adaptations developed by master mechanics out on the job.

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In order to make Master Mechanics better acquainted with this new publication, we are making available a limited number of free subscriptions for a short time only. We shall be happy to send to you, if you are a Master Mechanic or Equipment Superintendent, copies of MASTER MECHANIC for the next few issues. There will be no charge or obligation of any sort. However, there is a limit to the number of free copies we can send out, so "first-come, first-served." Please use the coupon printed below.

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Just open the valve . . . the new Thor Backfill Tamper will pound more dirt into the hole than you can shovel out of it!

Even the stiffest backfill is pounded solid—*quickly*, with the rapid, powerful blow of this new Thor . . . with a minimum of lifting by the operator. New plate valve and enlarged air ports deliver maximum power under varying air line pressure. Automatic lubrication. Positive-lock butt. Positive air seal.

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Only ADNUN BLACK TOP PAVERS give you these *Extra* Job possibilities!

ABOVE—*Laying a four-inch course of No. 1 rock with an Adnun. Rock passes 4-inch screen, retained on 2-inch . . . An extra, profitable job for any Adnun!*

ABOVE—*Putting down base course for another smooth, Adnun-laid highway. Only Adnun has Continuous Course Correction feature for smoothing subgrade irregularities out of succeeding courses. Note retractable wheels for fast, easy between-jobs travel.*

ADNUN Black Top Paver ability goes far beyond precision laying of all types of black-top mixes at big volume rates. With an Adnun you can add extra job possibilities that mean more machine time on profitable work for you: Laying stone, slag or gravel courses . . . Laying soil cement and all types of built-up subgrade material.

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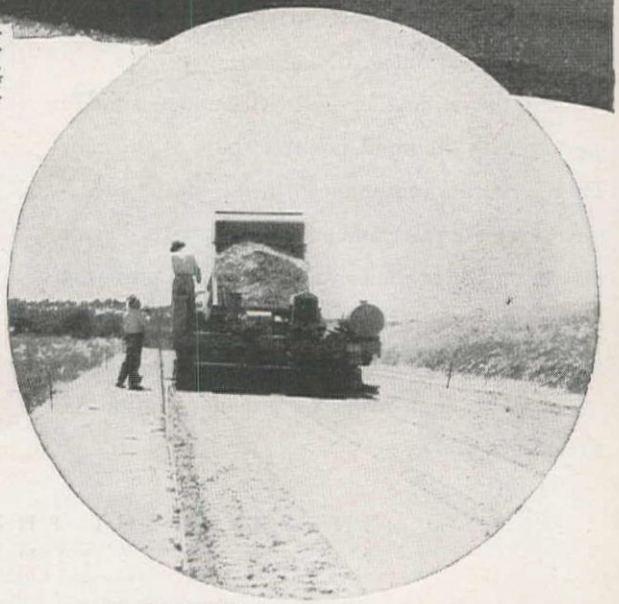
Adnun's rugged, cross-braced construction is made to take the pounding of heavy trucks for years of low-cost operation and maintenance. For the complete Adnun story, call your Adnun Representative, or write direct for illustrated Adnun Bulletin.



IN CIRCLE—*Laying a 10-inch course of subgrade aggregate to finished surface accuracy. A fast Adnun operation that makes finishing easier; completed roads smoother, longer-lasting.*

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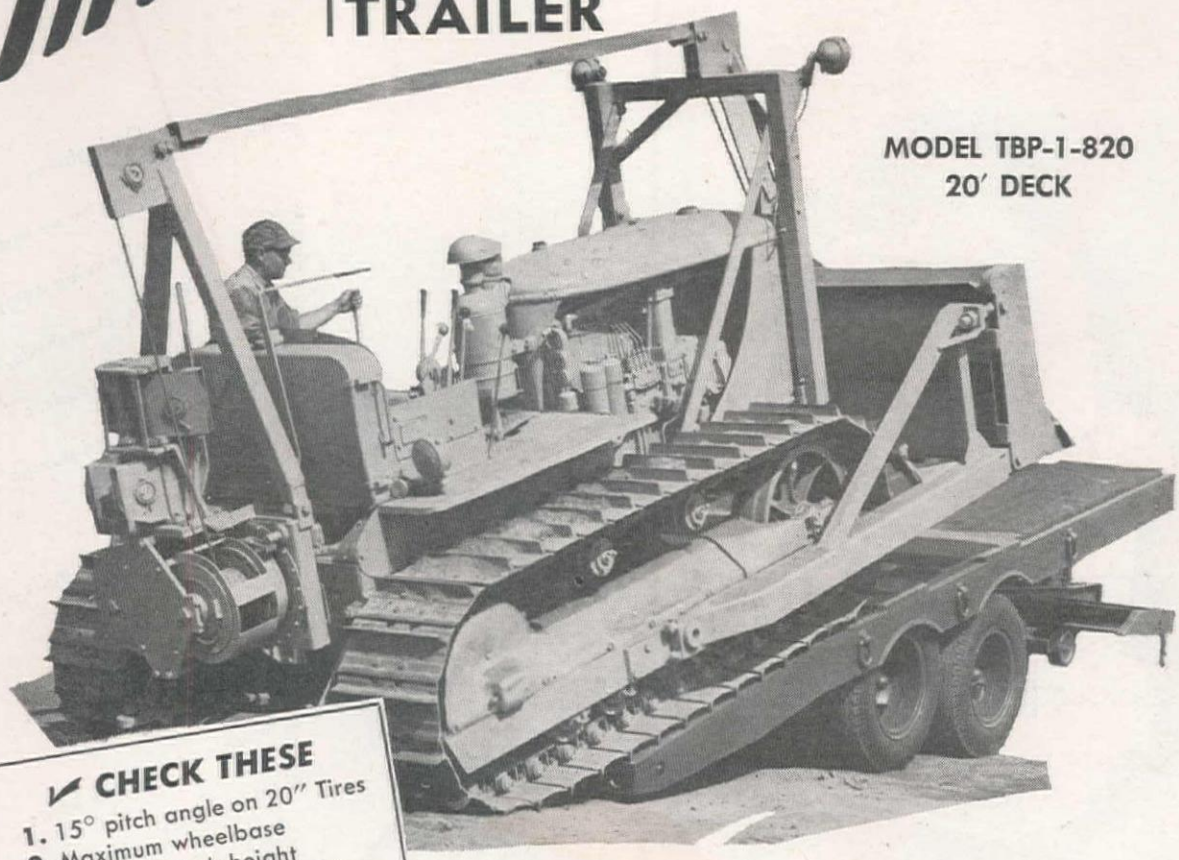

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Here—at last—is a sump pump built especially to save costly delays on the job and frequent replacement expense! The new Gardner-Denver VP4 Sump Pump has TOP-SUCTION—won't dig in and bury itself in the mud. But that's only one of its big features . . .

TOP SUCTION—Top-suction design eliminates one of the most common causes of pump failure—breaking of the pump shaft seal because of water pressure. In the VP4, the oil seal is subjected only to static pressure from depth of immersion when not in operation—when pump operates, water *cannot* reach oil seal or air motor.

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SIMPLE CONSTRUCTION—Buttress thread cap on air end for quick disassembly instead of multiple cap screws, studs or bolts. Air inlet has non-clogging filter screen easily and quickly removable for cleaning.

EASY TO HANDLE—Light in weight, the VP4 has substantial handles welded to the housing for greater ease in lifting and carrying.

For complete information write Gardner-Denver Company, Quincy, Illinois

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WESTERN BRANCH OFFICES:

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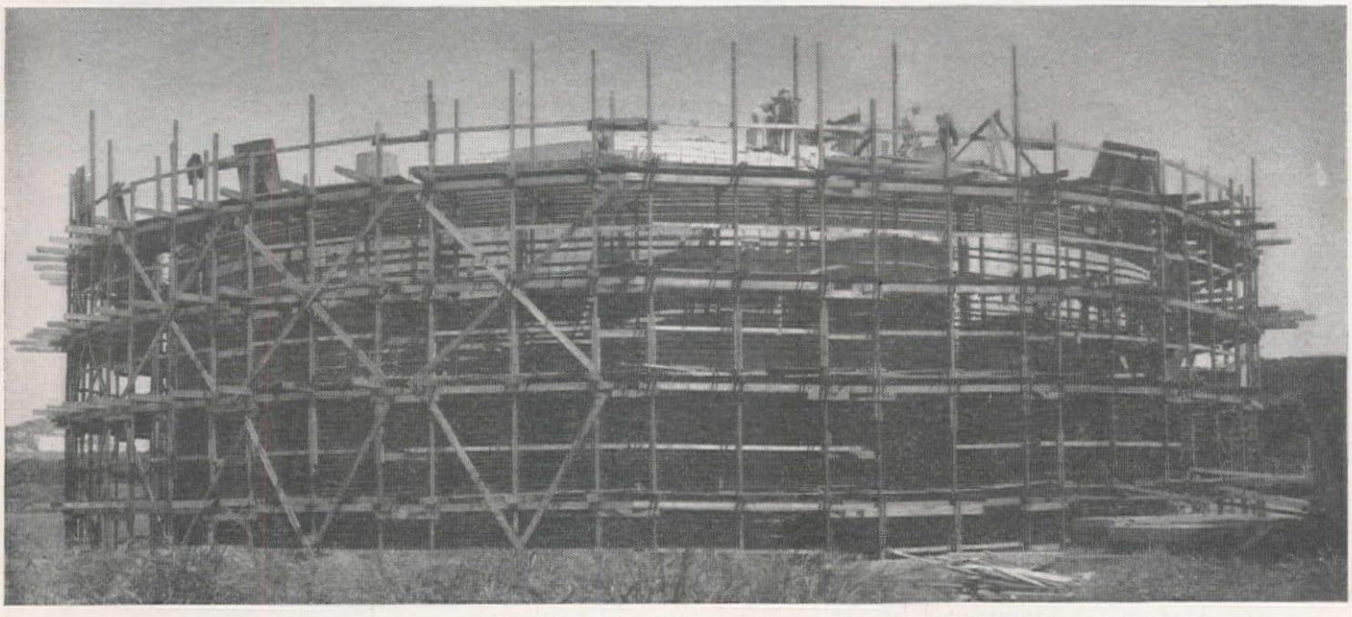
Special

ROLLED-THREAD TIE RODS

FOR RICHMOND-SUNSET DIGESTER TANK



Concrete digester tank for San Francisco Sewage Treatment Plant. 80 tons of Bethlehem Pacific rolled-thread, steel tie-rods encircle the wall of this structure. General Contractor, Clinton Construction Co., San Francisco.

This pre-stressed concrete digester tank is one of the largest of its kind ever constructed. Measuring 100 ft in diameter, it will handle approximately 20,000,000 gals of effluent per day for San Francisco's Richmond - Sunset Sewage Treatment Plant.

Bethlehem Pacific produced the specially - designed steel tie - rods that circle the cylindrical concrete wall of this tank. These rods range in length from 10 ft to 36 ft, and vary in diameters from 1-1/32 in. to 1-9/32 in. They were furnished with both right-hand and left-hand rolled threads to accommodate turnbuckles.

Special fastenings like this are an important part of Bethlehem Pacific's business. Unusual headed and threaded products are turned out every day by this company's three complete bolt-and-nut plants. These products are manufactured in either the finished or semi-finished form to suit the customers' requirements.

Whenever you need any kind of fastening specialty for any industrial purpose Bethlehem Pacific can produce it. Or whenever you need regular bolts and nuts Bethlehem Pacific can supply them in all sizes and styles.

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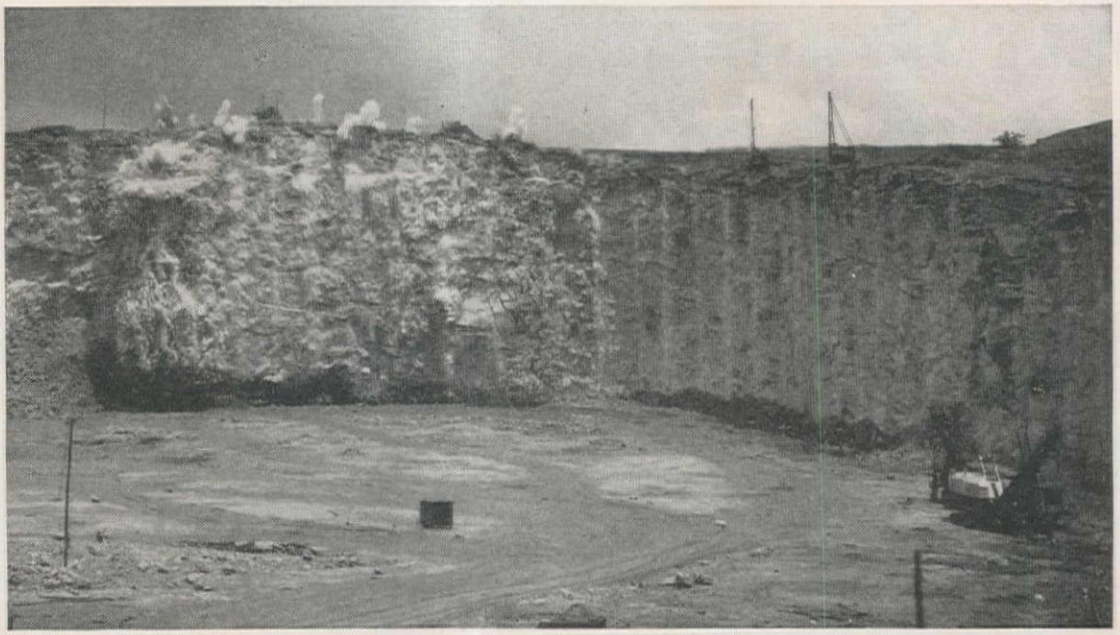
Can **ROCKMASTER** Lower Your Costs By More Efficient Use of Blasting Power?



Waste gas means waste power . . . notice the almost complete lack of it in this photo, even though the face has moved out.

THIS photograph tells more graphically than words why the Rockmaster Blasting System has been able to save as much as $20,000 a year in drilling and blasting costs in certain quarries . . . why it cuts costs way down on construction jobs and in coal stripping pits.

Rockmaster is the original milli-second delay blasting system . . . pioneered by Atlas. The choice of explosive velocity, detonators, spacing, loading and timing are all considered for your individual requirements.

That is why Rockmaster gives you better fragmentation and far less "back-break" in quarries and less pulverizing of coal in strip pits. That's why there's less noise and vibration, even though more holes may be fired.

Call in the Atlas representative today. Let him tell you what Rockmaster can do under your own conditions.

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"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

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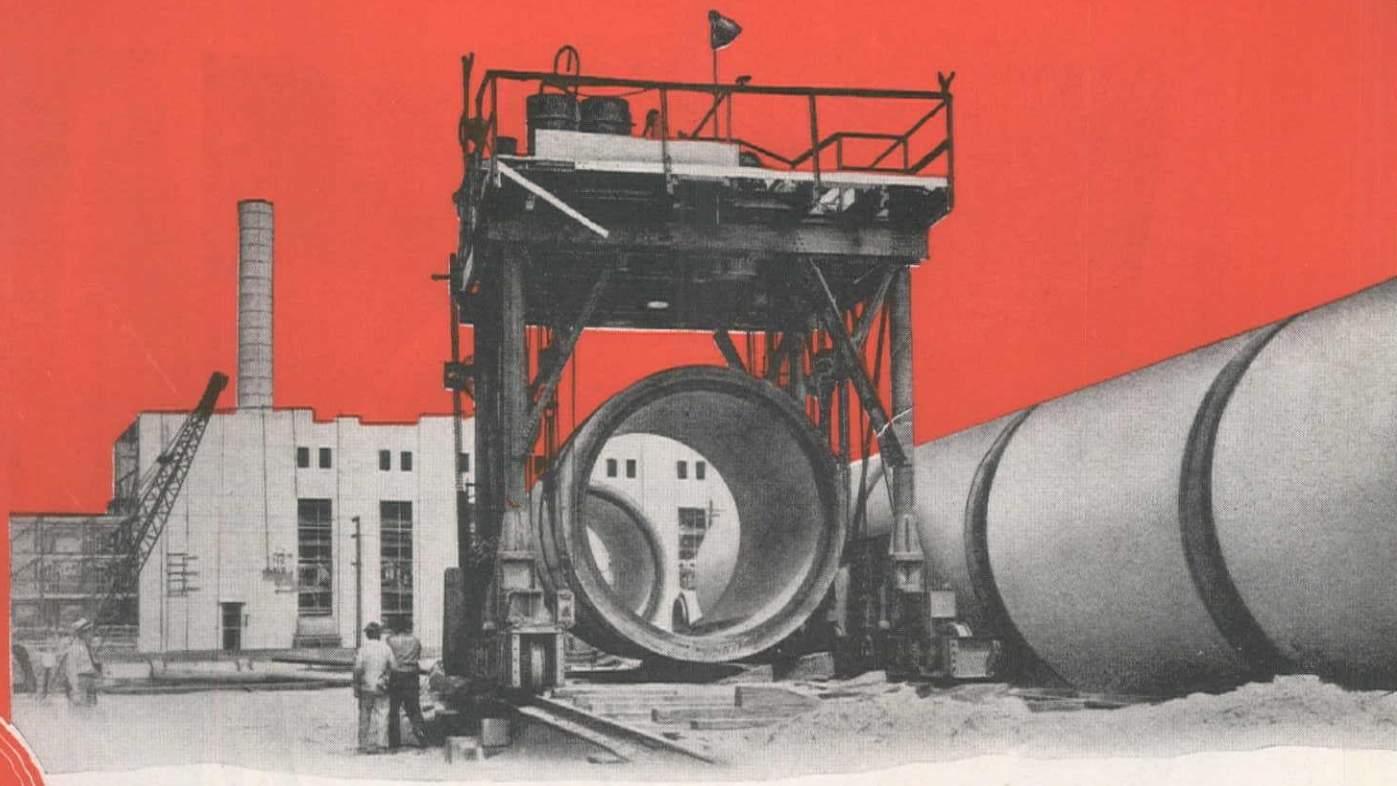

Pipe is suspended under special gantry crane which moves on a trestle track to position of installation. Divers then direct lowering and permanent placement of pipe under the ocean.

Pacific Ocean

Southern California Edison Co's

REDONDO STEAM STATION
Stone & Webster Engineering Corporation, Engineers.
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FOR IMPORTANT SUBAQUEOUS INSTALLATION—

large precast reinforced concrete pipe assures maximum permanence, performance and economy.

Extending under the Pacific Ocean for almost half a mile, two parallel alternating intake and discharge lines will perform the task of circulating ocean water, at an average flow of 400 second feet, for use in connection with the steam condensing system of the Southern California Edison Company's Redondo Steam Station, now nearing completion.

Each section of 120" I.D. pipe is equipped with Lock Joint Rubber Gasket joints which assure easy and accurate placement, as well as maximum joint flexibility for this important subaqueous installation.

Typical of American Pipe and Construction Co. products, here is a permanent pipe, offering the advantages of economical installation and maintenance, maximum hydraulic capacity, corrosion resistance and inherent strength, plus a large safety factor so necessary to any permanent installation.

This company has enjoyed a wide experience in the field of water supply line engineering and construction over a long period of years and this experience and training is available to water works officials and engineers. Information available upon request.

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PIPE AND CONSTRUCTION CO.

Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines. • P. O. Box 3428, Terminal Annex, Los Angeles 54, California

Quality pipe line products manufactured and installed by American include — Lock Joint Concrete Cylinder Pipe, Prestressed Lock Joint Concrete Cylinder Pipe, American Concrete Cylinder Pipe, Centrifugal Concrete Pressure Pipe.

Main Offices and Plant — 4635 Firestone Blvd., South Gate, California
District Offices and Plants — Oakland • San Diego • Portland, Oregon

Original Woodcut by Lynd Ward

Service on a nation-wide basis

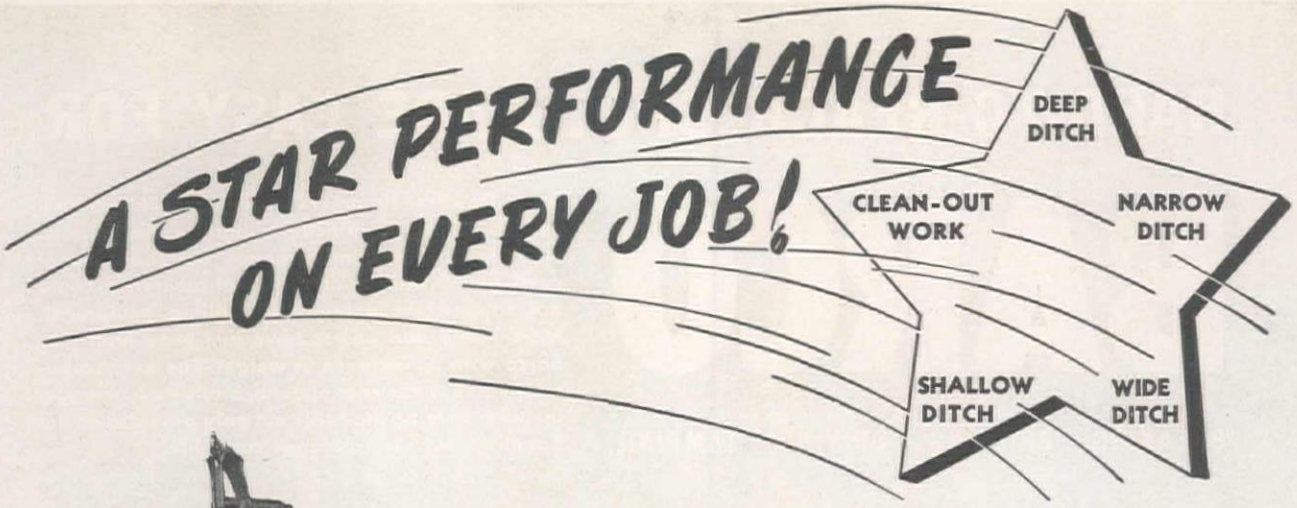
From the coral strands of Florida to the ski-slopes of Vermont and the High Sierras—in every State of the Union—U. S. Pit Cast and Super-de Lavaud centrifugally cast pipe render dependable service in water, gas and sewerage systems. Our plants and storage yards are strategically located for shipment by rail, truck or water. We maintain sales offices in all principal cities. For unusual problems in pipe design, a resourceful technical service is at your command.

U.S. cast iron PIPE

FOR WATER, GAS, SEWERAGE AND INDUSTRIAL SERVICE

UNITED STATES PIPE AND FOUNDRY CO., GENERAL OFFICES: BURLINGTON, N.J.
Plants and Sales Offices throughout U.S.A.

A STAR PERFORMANCE ON EVERY JOB!



HENDRIX *Lightweight* DRAGLINE BUCKETS

10% to 14% Manganese Steel Chains and Fittings are standard on all types and sizes.

3/8 TO 40 CUBIC YARDS

3 TYPES DESIGNED FOR EVERY DIGGING CONDITION

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

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

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

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

Write for descriptive literature—or ask your dealer

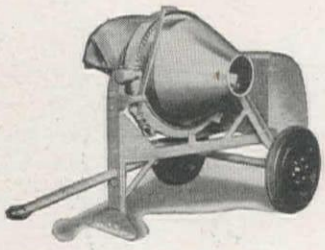
HENDRIX MANUFACTURING COMPANY
MANSFIELD INCORPORATED LOUISIANA

. . . from little fellow to big brother, SMITHS are GOOD MIXERS . . .

Everywhere you go . . . in both the social world and business world . . . good mixers are popular.

For almost a half century, the name SMITH has been popularly associated with Good Mixers. From the small 3½-S Mascot to the big 112-S Tilter, the World's Largest Concrete Mixer, Smith Mixers rate "TOPS" in the industry. They are popular with contractors because they produce big yardage concrete on a fast, efficient production basis. They are specified by engineers because of their uniform mix and absolute dependability.

Yes sir — Smith Mixers have been around a long time. Ask any of the users who have associated with them throughout these many years. Invariably, they will tell you ". . . from little fellow to big brother, SMITHS are GOOD MIXERS"!

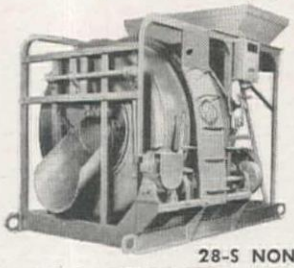


3½-S MASCOT

6-S TRAIL-SMITH

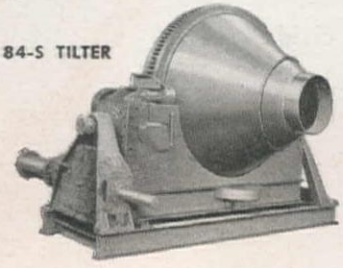
11-S TRAIL-SMITH

16-S NON-TILTER

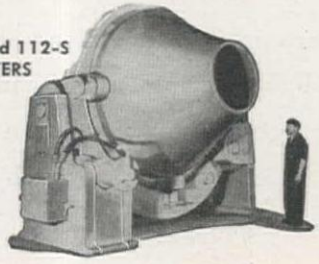


28-S NON-TILTER

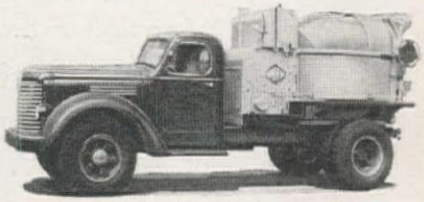
28-S TILTER



84-S TILTER



56-S and 112-S TILTERS



SMITH-MOBILE TRUCK MIXER AND AGITATOR

For that next concrete job, large or small, investigate SMITH Mixers and Smith-Mobile Truck Mixers. Write today for literature. THE T. L. SMITH CO., 2871 No. 32nd St., Milwaukee 10, Wis., U.S.A.

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

CONCRETE MIXERS

Famous for Performance on the World's Greatest Projects

A 5305-1P

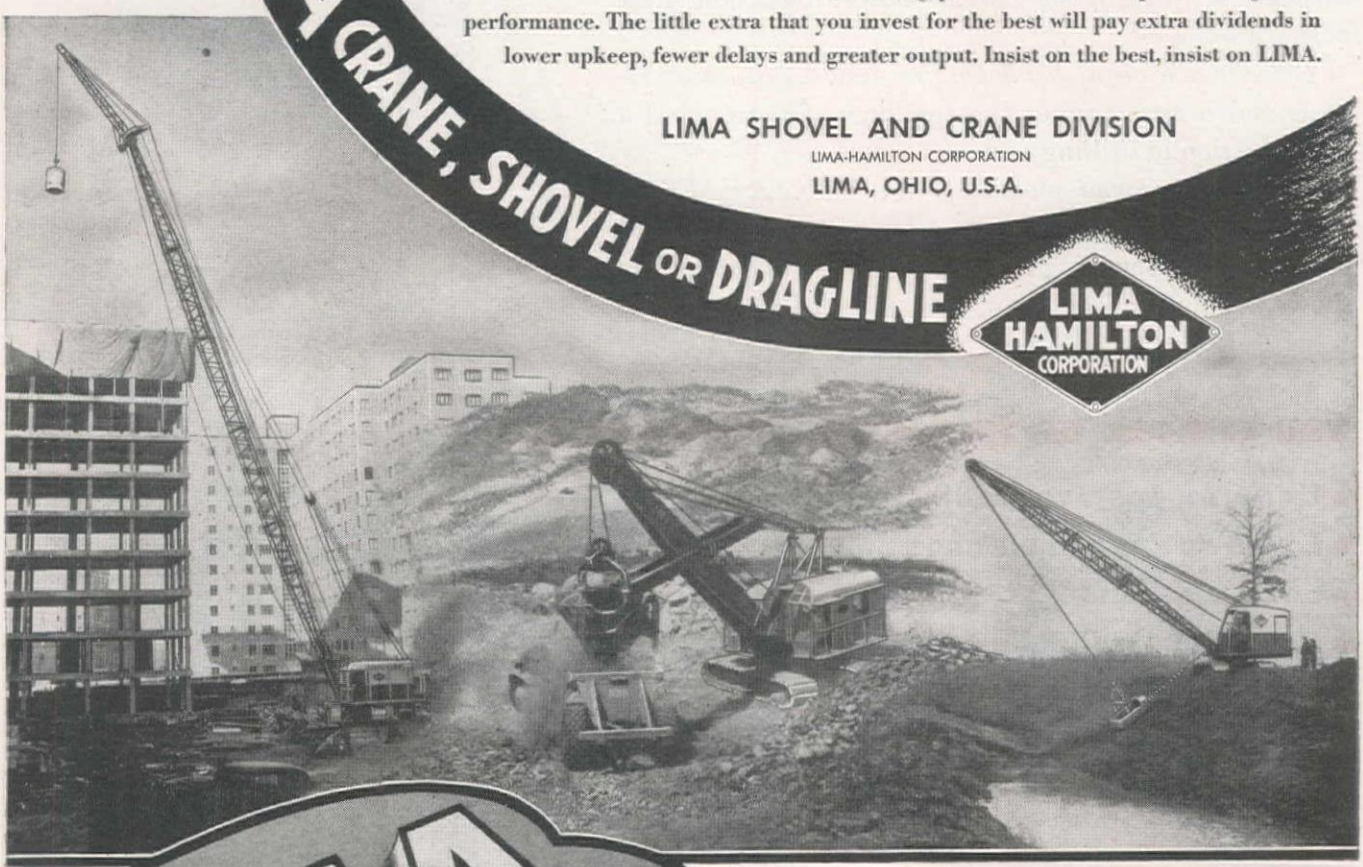
DO YOUR EXCAVATING and MATERIAL HANDLING JOBS Faster for Less

with a LIMA CRANE, SHOVEL OR DRAGLINE

Owners and operators alike are enthusiastic about the fast digging cycles, low cost of maintenance, ease of operation, and exceptional fuel and lubrication economies of LIMA shovels, cranes and draglines. Their superior performance in all classes of work is a topic of conversation with users who make it their business to know about the fine points of all makes of shovels, cranes and draglines. This comparison has resulted in a steady increase in the number of LIMAS in quarries, coal and metal mines, gravel pits, brick plants, timber and construction work of all kinds. It is convincing proof of LIMA'S superior design and performance. The little extra that you invest for the best will pay extra dividends in lower upkeep, fewer delays and greater output. Insist on the best, insist on LIMA.

LIMA SHOVEL AND CRANE DIVISION
LIMA-HAMILTON CORPORATION
LIMA, OHIO, U.S.A.

LIMA HAMILTON CORPORATION



LIMA CRANES SHOVELS DRAGLINES

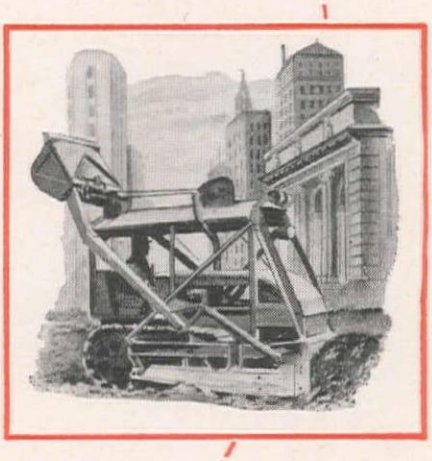
DIVISIONS OF LIMA-HAMILTON CORPORATION

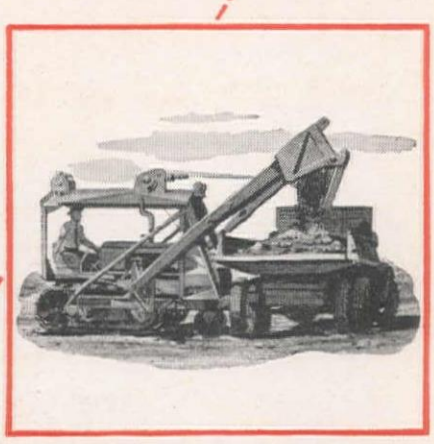
Lima Locomotive Works Division
Lima Shovel and Crane Division
Lima, Ohio

Hooven, Owens, Rentschler Co.
Niles Tool Works Co.
Hamilton, Ohio

Our Seattle Office: 1932 First Avenue South, Seattle 4, Washington. Our San Francisco Office: 1315 Howard Street, San Francisco 3, California.
Sales Agents: Feenaughty Machinery Company, 112 S.E. Belmont Street, Portland 14, Oregon; 600 Front Street, Boise, Idaho; Smith Booth Usher Company, 2001 Santa Fe Avenue, Los Angeles 54, California; Held-McCoy Machinery Company, 3201 Brighton Boulevard, Denver 5, Colorado; Smith Booth Usher Company, 1756 Grand Avenue, Phoenix, Arizona; Contractors' Equipment & Supply Company, Springer Building, Albuquerque, New Mexico; Modern Machinery Company, Inc., 4412 Trent Avenue, Spokane 2, Washington; Jameson Engineering Sales, Fairbanks, Alaska; Fouiger Equipment Company, Inc., 1361 South Second West, Salt Lake City 8, Utah; Thompson-Sage, Incorporated, 400 South Wilson Way, Stockton, Calif.

ditchdigger backfiller loader in 1 package



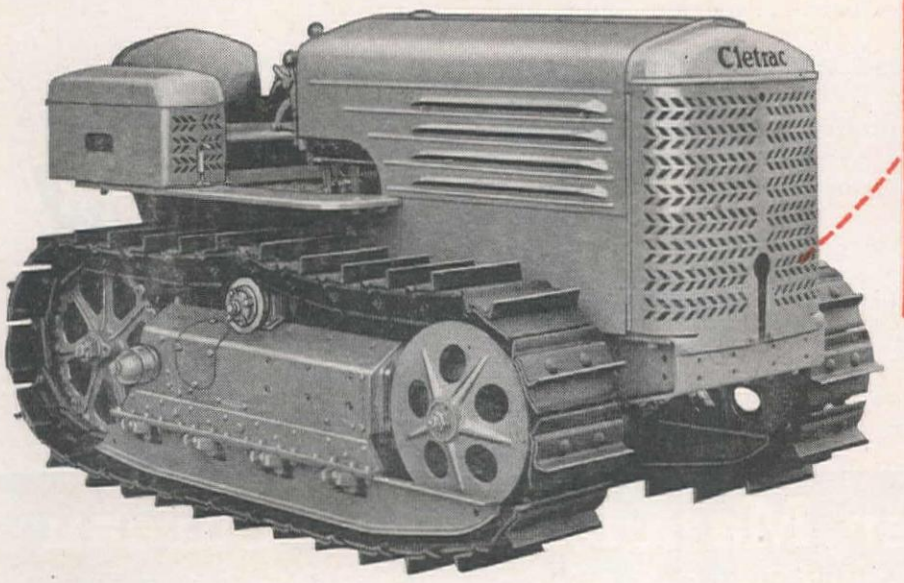


Here's the right combination for economical ditching . . . an Oliver "Cletrac" track tractor, a Sargent Overhead Shovel, Backhoe and Bulldozer. The Backhoe digs the trench . . . from 3½ to 6½ feet deep . . . the Overhead Shovel lays the pipe and loads out the excess earth and the Bulldozer backfills the ditch and compacts the fill. And powered by an Oliver "Cletrac," it's a package of rugged machinery that not only cuts your equipment costs but simplifies your jobs.

Converting the unit from Backhoe to Overhead is simplicity itself. Boom and bucket can be attached in an hour and detached in 10 minutes. Shovel arms and bucket can be attached and detached equally fast.

When you're not ditch-digging, this unit can be used to load sand, gravel, stone, debris or snow.

For all the facts, see your Oliver "Cletrac" dealer or write The OLIVER Corporation, 19300 Euclid Avenue, Cleveland 17, Ohio



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

"is it fun to be fooled?"

We don't think so . . . not when it comes to paying out hard-earned dollars for equipment. As manufacturers, we don't like to be fooled in our purchases of machinery and materials. We prefer to *know*. And we want you to know!

This is the reason why we have formed the Truck Mixer Manufacturers Bureau . . . an organization founded on service to you. We have set up certain standards that must be met by each and every truck mixer. The Bureau rating plate, prominently displayed on a truck mixer, is your assurance of full rated capacity . . . your protection against "outlaw sizes." Conversely it is our protection against the loss of your "good will" . . . of the loss of your confidence in our product through inaccurate capacity ratings.

Truck Mixer Manufacturers Bureau

Affiliated with The National Ready Mixed Concrete Association

BLAW-KNOX DIVISION Pittsburgh, Pa.	CONCRETE TRANSPORT MIXER CO. St. Louis, Mo.	RANSOME MACHINERY COMPANY Dunellen, N. J.
CHAIN BELT COMPANY Milwaukee, Wis.	THE JAEGER MACHINE COMPANY Columbus, Ohio	THE T. L. SMITH COMPANY Milwaukee, Wis.

THE SERVICE BACK OF LINK-BELT SPEEDER

Keeping every Link-Belt Speeder Shovel-Crane in tip-top operating condition is one of the principal interests of Link-Belt Speeder and its nationwide distributor organization. In every principal city in United States and Canada, and in foreign lands, a stock of parts and men trained in the servicing of Link-Belt Speeder products, are in readiness to meet the needs of the user, wherever located.

Link-Belt Speeder advanced engineering, honest construction and quickly available service add up to more profitable machine hours and greater returns on your investment. Your distributor will gladly show you how the Link-Belt Speeder line of shovels, cranes and draglines ranging from 3/8 to 3 yard capacity can give you just the machine to fit your specific needs.

10,924

Every Link-Belt Speeder Shovel-Crane is quickly convertible to shovel, trench hoe, pile-driver, clamshell or dragline. You "Keep in the bidding" with your multi-purpose Link-Belt Speeder.

LINK-BELT SPEEDER

LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA

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

THE CUSTOMERS TELL US HOW GOOD OUR PIPE IS

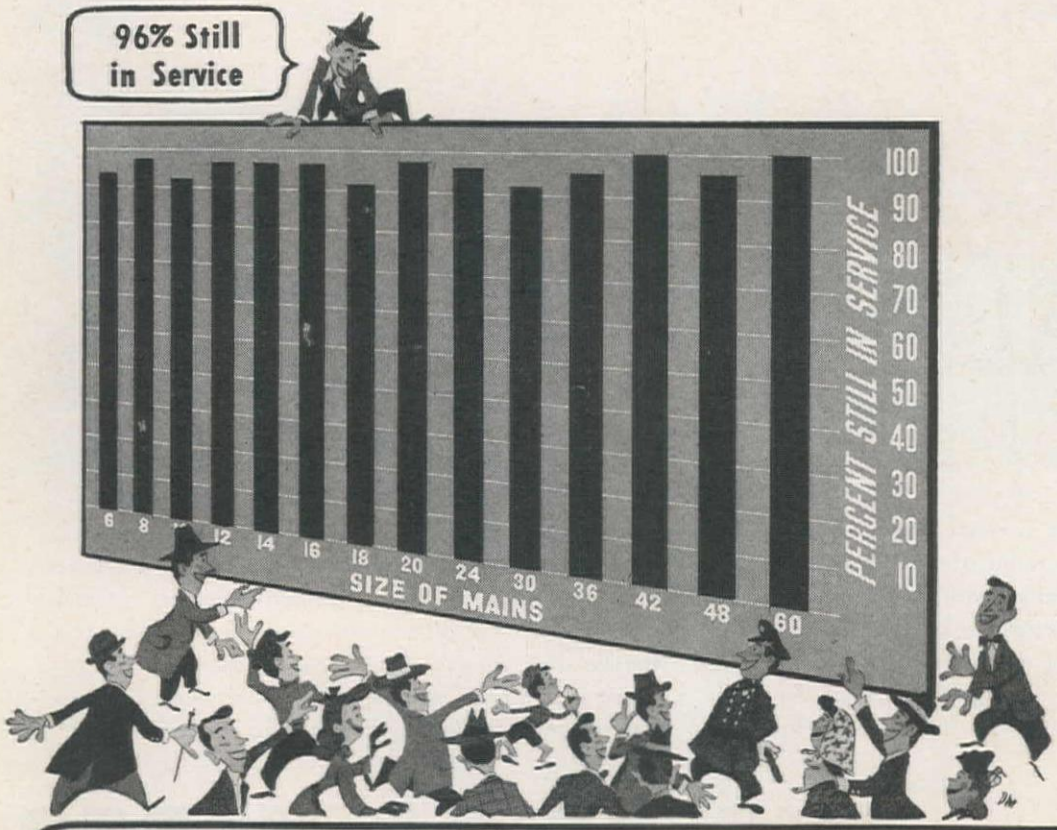
This is a "man bites dog" version of what we have been saying in our advertisements for these many years—namely, that the great majority of the *original* cast iron water mains, laid in this country from the earliest days, are still in service. Now our customers give *us* the facts —facts secured *by* users, *from* users, *for* users.

The chart below is based on a published report of the American Water Works Association of the results of a survey of the "Survival and Retirement of Water Works Facilities" in 25 representative cities. These are facts taken from the records. *They show that 96% of all cast iron water mains ever laid in the 25 surveyed cities, since 1817, in sizes 6-inch and over, are still in service.*

96% of all cast iron water mains* laid in these 25 cities over a period of 128 years is still in service.

Alexandria, Virginia
Babylon, New York
Clinton, Iowa
Clyde, New York
Denver, Colorado
Des Moines, Iowa
Detroit, Michigan
Huntington, West Virginia
Jamaica, New York
Merrick, New York
Norwich, New York
Ottawa, Ontario
Philadelphia, Pennsylvania
Portland, Maine
Rochester (Suburban), N. Y.
St. Mary's, Pennsylvania
St. Paul, Minnesota
Sag Harbor, New York
Scranton, Pennsylvania
Springfield, Massachusetts
Summit, New Jersey
Syracuse (Suburban), N. Y.
Utica, New York
West Palm Beach, Florida
Winnipeg, Manitoba

*Sizes from 6 to 60 inches.



CAST IRON PIPE SERVES FOR CENTURIES

SULPHATE RESISTANT

BRICK MIX

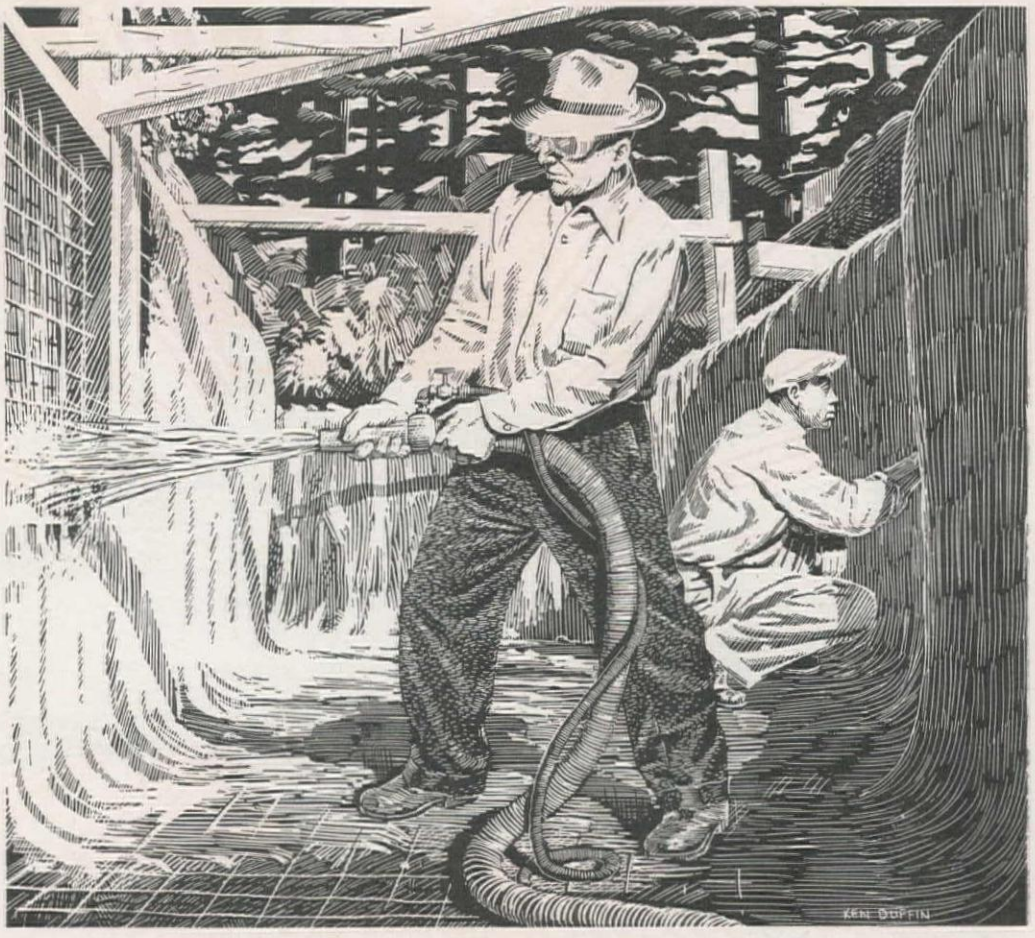
POZZOLAN

PRONTO

PLASTIC

STANDARD PORTLAND

THEY HAD A PROBLEM...



Permanente *HIGH-EARLY STRENGTH* was the answer.

The PACIFIC GAS & ELECTRIC COMPANY had a problem on their South Yuba Canal, near Colfax, California. Quick changes in temperature, so common in the High Sierras, sometimes caused cracks to form in the cement lining of the canal. The turbulent water, flowing swiftly from the outfalls of the power station, could cause heavy damage by undermining the canal bed through the cracks, if immediate repairs were not made. Since the water could only be turned off for a limited period, patching had to be done with a cement that would set, water resistant, in a matter of hours.

Permanente HIGH-EARLY STRENGTH Portland Cement met these specifications with flying colors. Applied by GUNITE, Permanente High-Early Strength set, water resistant in *three hours!* Developing in 24 hours, a strength equal to that attained by ordinary cement in seven days.

Permanente HIGH-EARLY STRENGTH Portland Cement conforms to A. S. T. M. Specifications C-150, Type III, and Federal Specifications SS-C-192, Type III. It is specially made to be used in rush concrete jobs, such as paving, foundations, piers, etc., where a fast set is the problem.

Write for Permanente's booklet on "Cement Types and Uses"

PERMANENTE CEMENT COMPANY

On the job - On time

PERMANENTE CEMENT COMPANY

PERMANENTE, SANTA CLARA, YOSEMITE AND KAISER BRANDS OF PORTLAND CEMENT AND PERMANENTE LIME PRODUCTS

OAKLAND • SEATTLE • HONOLULU

ONE NAME for all Tide Water Associated Industrial Lubricants everywhere

● All Tide Water Associated Oil Company industrial lubricating oils and greases, *wherever you buy them,* are now conveniently identified by the over all brand name, TYCOL.

For still further convenience, different types of Tycol lubricants are sub-classified according to characteristics, instead of end use, under class names beginning with the letter "A," for Associated.

This new system simplifies your purchasing by reducing the number of brand names in the great Tide Water Associated line of industrial lubricants. For a comprehensive folder explaining and listing the new and former brand names, call your Associated Representative, or use coupon below.

TIDE WATER ASSOCIATED OIL COMPANY

Tide Water Associated Oil Company, Wholesale Dept.
79 New Montgomery Street, San Francisco 20

Gentlemen: Please send me your folder on Tycol Industrial Lubricating Oils and Greases, with list of new and former brand names.

*Name*_____ *Firm*_____

*Position*_____ *Address*_____ *City*_____

Model HBJ drills angle holes to 45° from vertical.

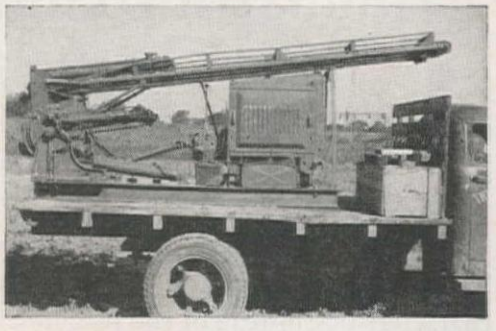
New BUDA all-purpose EARTH DRILL with "Finger-Tip" Hydraulic Control . . .

Tower raises hydraulically in a matter of seconds—ready to drill holes to 12 ft. depths.

OFFERS VERSATILE, COST-CUTTING FEATURES FOR SCORES OF CONSTRUCTION JOBS

- Drills 6 in. to 42 in. diameter holes to maximum depth of 12 ft.
- Ample Power for tough drilling with 4-cylinder, heavy duty BUDA gasoline engine. Automotive type transmission—4 speeds forward—one reverse.
- Hydraulically controlled operations: Hydraulic fore and aft adjustment of 15° from vertical to plumb drill—Hydraulic side adjustment of 45° to right or left of vertical to plumb holes on uneven terrain or to drill angle holes—Hydraulic feed into ground—Fast mechanical power, augmented by hydraulic booster, for lifting helix and dirt from hole.
- Hydraulic Power cuts "set up" time—Drill tower lowers to horizontal traveling position at a touch of the "Finger Tip" Control lever.
- This packaged unit is quickly installed or removed from truck or trailer.
- Pole setter tower extension, available as optional equipment, sets poles up to 45 ft. in length.

See your nearest BUDA distributor, or write for complete details of the new Earth Drill models.



Hydraulic control lowers drill tower quickly but smoothly, and entire unit is ready to move to the next job.

BUDA

15424 Commercial Avenue
HARVEY *(Chicago Suburb)* **ILLINOIS**

BUDA DISTRIBUTORS

Arnold Machinery Co., Inc., 153 W. Second South St., Salt Lake City, Utah; State Tractor & Equip. Co., P. O. Box 3795, Phoenix, Ariz.; Coast Equipment Co., 948 Bryant St., San Francisco, Calif.; Contractors Equip. & Supply Co., Springer Bldg., P. O. Box 456, Albuquerque, N. Mex.; Ray Corson Machinery Co., 15th & Wazee Sts., Denver, Colo.; Fornaciari Co., 821 S. Santa Fe Avenue, Los Angeles 21, Calif.; The Sawtooth Co., 710 Front St., Boise, Idaho; Star Machinery Co., 1741 1st Ave., S., Seattle Wash., 415 E. Sprague, Spokane 88, Wash.; Western Construction Equip. Co., 505 North 24th St., Billings, Mont.; Loggers & Contractors Machinery Co., 240 S. E. Clay St., Portland 14, Ore.; Sierra Machinery Co., Reno, Nev.

STOODY wear protection

keeps these mighty earth movers

ON THE JOB

Wherever earth is moved, abrasion takes a heavy toll of equipment life. Unprotected parts soon need replacement—and down time is lost time.

STOODY Electrodes provide economical wear protection two ways:

By providing the right build-up electrodes for restoring worn parts to original size and shape.

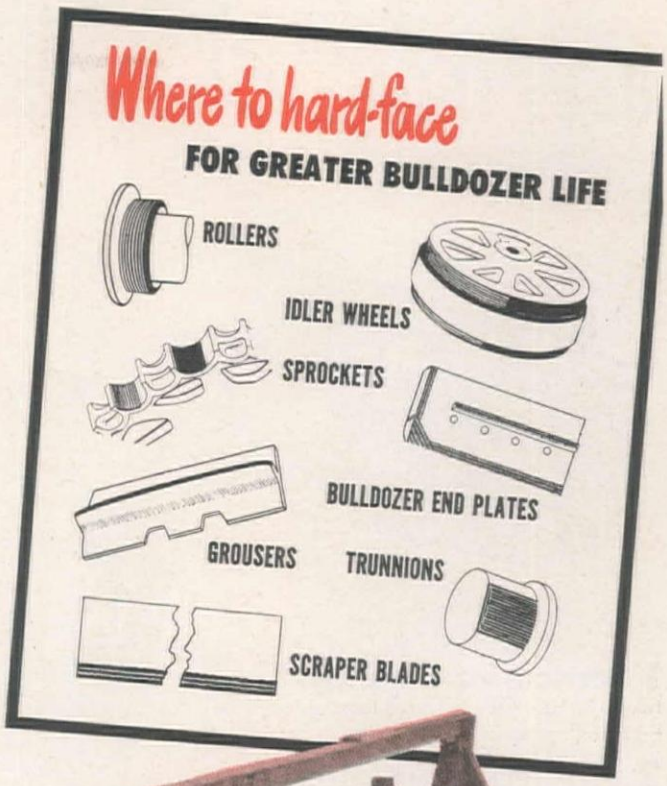
By providing the one BEST hard-facing alloy for increasing equipment life far beyond normal expectancy.

FOR QUICKER BUILD-UPS Stoody Manganese Electrodes have important advantages. Fabricated construction permits ample manganese to offset any loss in burn-off. As a result, risk of brittleness from manganese deficiency in deposits is overcome. You get high build-ups with low penetration with either AC or DC application. And don't overlook its LOW COST . . . 40c per lb. in 1/4" and 3/16" rod sizes.

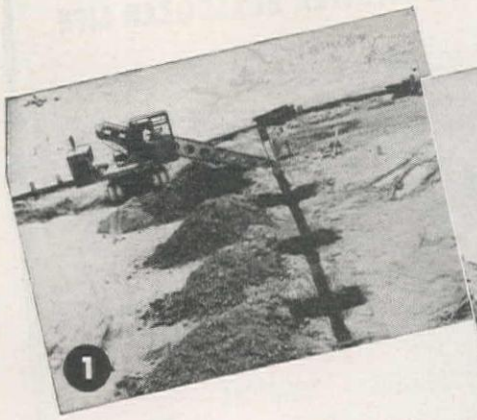
FOR WEAR RESISTANCE Stoody makes 12 different hard-facing alloys. Each is specifically designed to combat a major wear problem. Out of this selection you're assured of the most efficient alloy for your particular need—whether it's protection against abrasion, heat, impact, corrosion—or any combination of these factors.

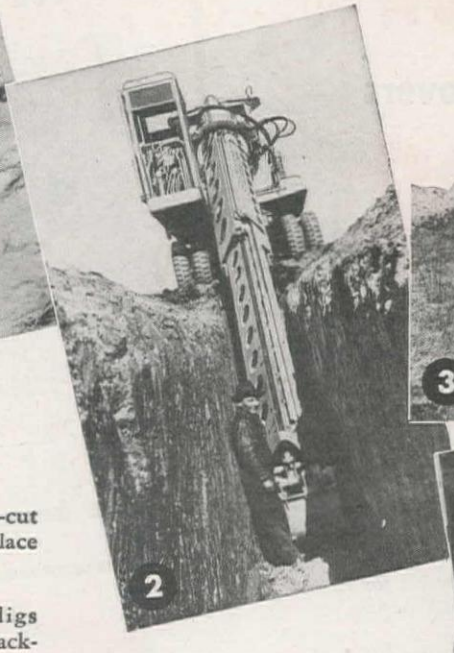
Write for free STOODY HARD-FACING GUIDE BOOK . . . shows where and how to save money on 91 varied pieces of heavy equipment!

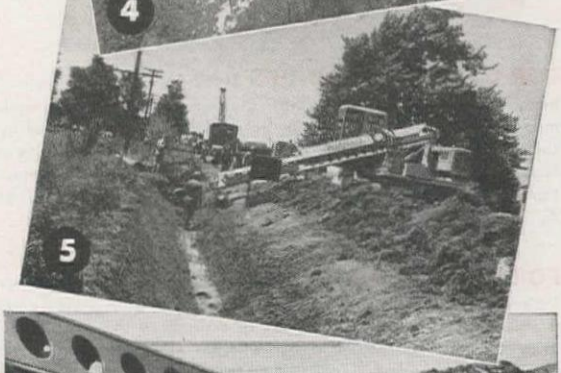
STOODY COMPANY
1156 WEST SLAUSON AVENUE
WHITTIER, CALIFORNIA



GRADALL
does things *One Machine* never did before!







1 TRENCHING—Gradall digs clean-cut footings, lifts prefabricated forms into place —cleans up wastes.

2 DEEP TRENCHING— Gradall digs this narrow 10′ trench, lays pipe, then backfills—avoiding separate machines and costly hand labor.

3 CHAMFERING — Gradall "Arm-Action" tilts the boom and tool to neatly chamfer trench edges.

4 EXCAVATING—Gradall digs walls sheer and clean, works with low headroom, around obstacles.

5 DITCHING—Gradall cleans neglected road ditches to proper pitch; will next dress slopes and load spoil on truck all without manual labor.

6 PAVEMENT REMOVAL—is done neatly, accurately with Gradall—saves valuable time in resurfacing.

CONCEIVED BY A CONTRACTOR . . .
PRECISION-BUILT BY WARNER & SWASEY

. . . . the Gradall is amazing construction men with its multi-purpose adaptability. Traveling from job to job at truck speed, it does a variety of work never before possible with one machine—doing more jobs better, at lower cost.

SALES AND SERVICE:

GOLDEN STATE EQUIPMENT CO.
4770 Valley Blvd.
Los Angeles 32, California

BAY EQUIPMENT COMPANY
3254 East Shore Highway
Richmond, California

INDUSTRIAL EQUIPMENT CO. of Arizona
720 South 19th Avenue, P. O. Box 2669
Phoenix, Arizona

GRADALL
DIVISION
WARNER & SWASEY
Cleveland

Gradall Reg. U. S. Pat. Off.

"I RECOMMEND THE TRAILMOBILE FOR ITS MANEUVERABILITY" —

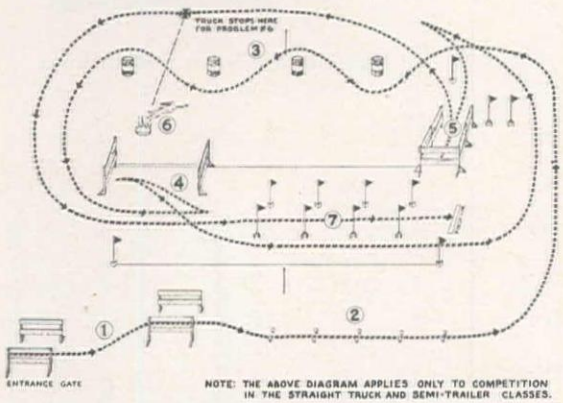
says C. W. ZIMMERMAN

Winner

1947 ATA ROADEO

The illustration below is a diagrammatic layout of the course of the National Truck Roadeo, reproduced through the courtesy of the American Trucking Association. Before attempting the seven field tests noted on the drawing, drivers must first pass rigid examinations for appearance, alertness, posture, safe driving rules, general trucking industry information, and first aid.

NATIONAL TRUCK ROADEO
DIAGRAMMATIC LAYOUT OF THE COURSE



NOTE: THE ABOVE DIAGRAM APPLIES ONLY TO COMPETITION IN THE STRAIGHT TRUCK AND SEMI-TRAILER CLASSES.

They say that ONCE is an accident; TWICE is a coincidence; and THREE TIMES is HABIT. That may well apply to Charles W. Zimmerman, three times winner of the A.T.A. Roadeo. For about 17 years, Zimmerman has been under the wheel, driving various tractor-semi-trailer combinations, and his choice of equipment at the A.T.A. Roadeo was born of experience. When a champion combines his skill with the right kind of equipment, you have a winning combination. Here is the way Zimmerman puts it:

"Having had the privilege of working with various makes of trailers, I found that the TRAILMOBILE had many advantages over other makes that I was privileged to use in my daily work. The outstanding features in the TRAILMOBILE are the shorter wheel base for easier and shorter turning; the clear visibility of the undercarriage in backing into a tough spot with your head and body extended out of the left door, and guiding yourself by looking backwards through the undercarriage of the trailer.

"I also found that the TRAILMOBILE was exceptionally easy to maneuver when in a forward position, and using the parlance of the truck driver, 'follows like a feather'. I recommend the TRAILMOBILE highly for its maneuverability in all respects".

THE TRAILMOBILE COMPANY
BERKELEY, CALIFORNIA

TRAILMOBILE

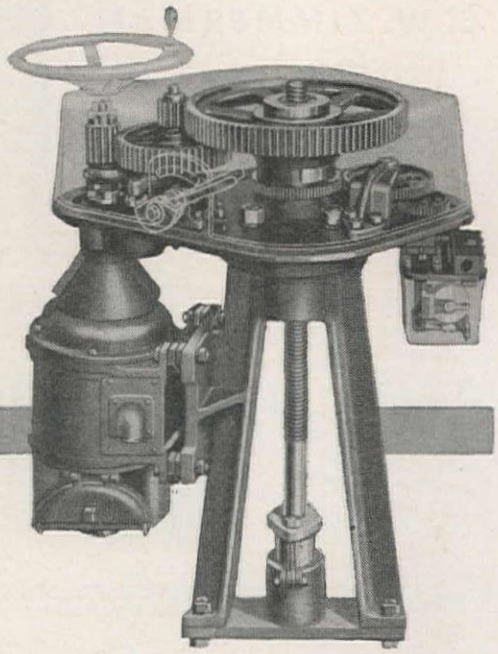
LOS ANGELES • BERKELEY • SACRAMENTO • SANTA ROSA • FRESNO • SAN JOSE • BAKERSFIELD • STOCKTON • OGDEN • SEATTLE
HONOLULU • SANTA BARBARA • PORTLAND • EUREKA • SAN DIEGO

Chapman

MOTOR UNITS

Give You

These Practical Advantages



View Showing Internal Mechanism of Motor Unit.

1. Weatherproof Housing
2. Ruggedness and Simplicity
3. Emergency Handwheel

Chapman Motor Units are designed for the positive electrical control of various types of valves and sluice gates. The internal mechanism of each standard unit is completely enclosed in a weatherproof, steam-tight housing, making it a practical power control unit on valve equipment indoors, outdoors, or completely submerged.

Built with extra ruggedness to insure positive operation, the unit is extremely simple, consisting of a slow speed motor driving direct through a train of spur gears. There is no drift and the limit switch can be adjusted quickly and accurately. A handwheel, which does not revolve during motor operation, is provided for emergency use in case of power failure. Write today for complete information.

Floor Stand Equipment with Chapman Improved Motor Unit.

The Chapman Valve Mfg. Co.
INDIAN ORCHARD, MASS.

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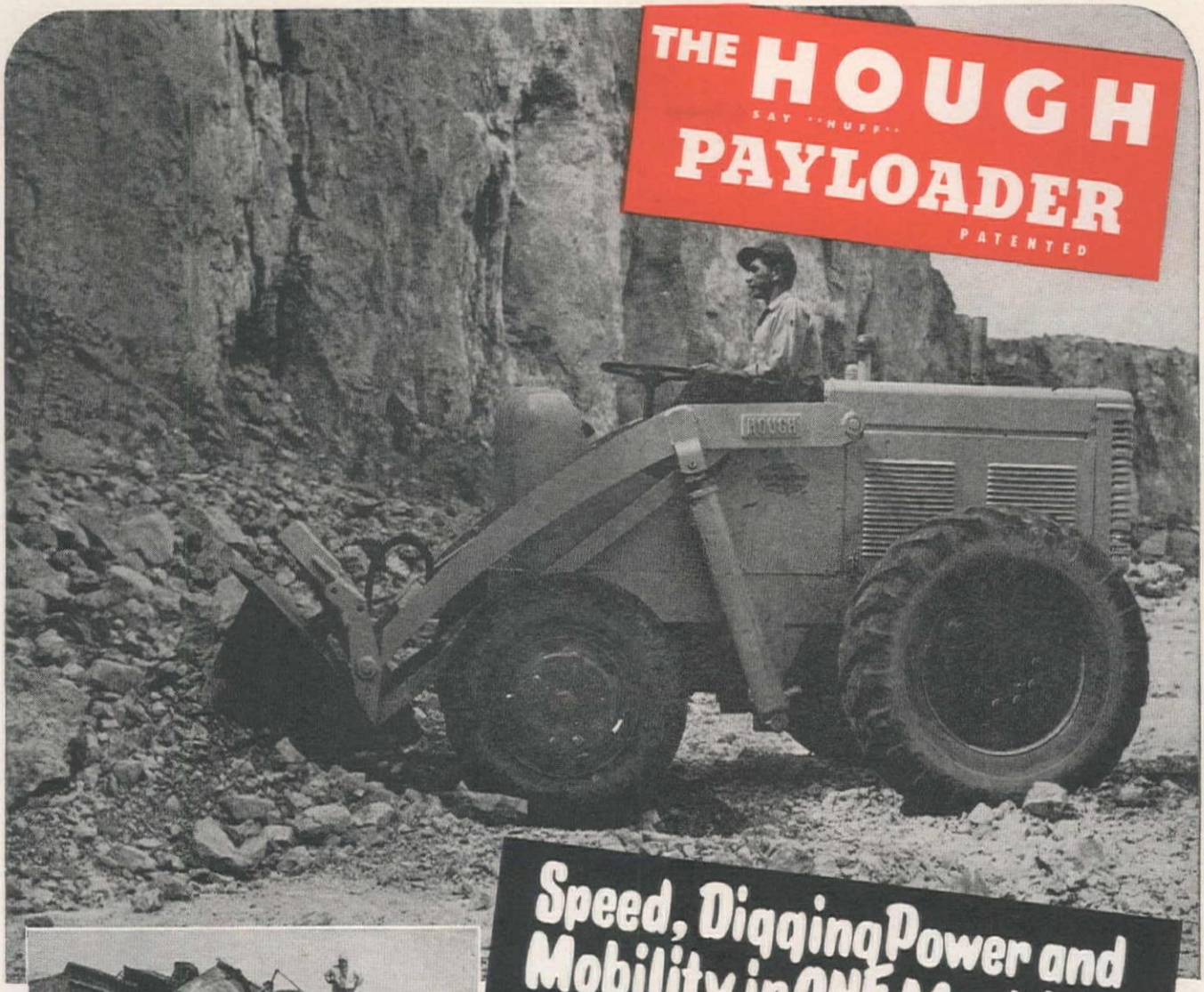

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REAL DIGGING POWER — MODEL HL LOADING BLASTED ROCK.

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The Hough Payloader is a compact package of speed, power and ability to do a big job even in cramped quarters. Designed and built as a complete unit from the ground up — close-coupled, ruggedly constructed and built low. Large tires give tremendous tractive ability and digging power to excavate at a profit. It will also load and handle a wider variety of materials faster, cheaper and better than ever before possible in a machine of this type. Several travel and working speeds both forward and reverse, make it quick to the job, fast on the job. Complete operator visibility and comfort, fingertip hydraulic control and easy steering promotes top speed output the full shift.

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THE FRANK G. HOUGH CO.

TRACTOR SHOVELS SINCE 1920

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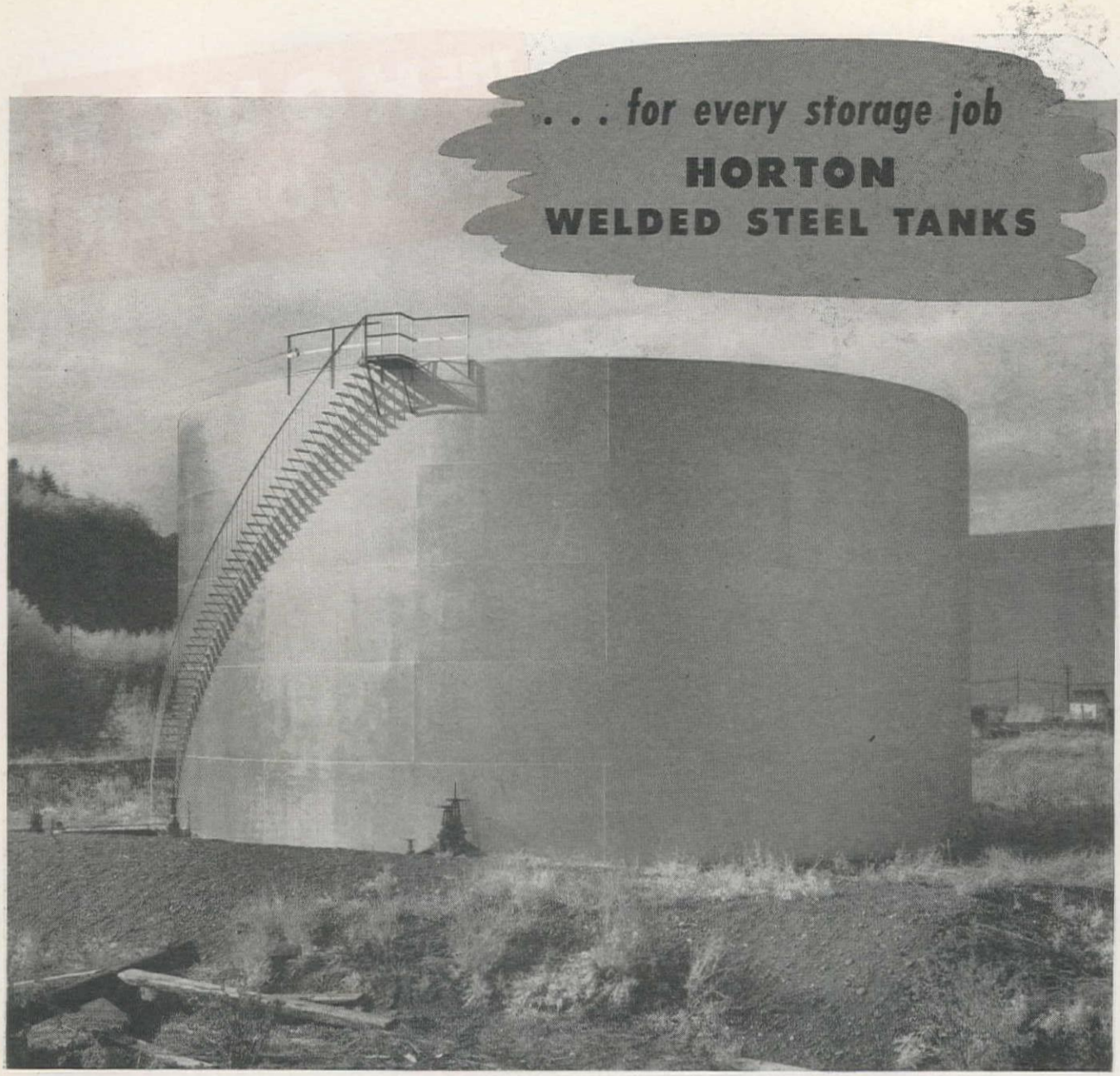

HORTON WELDED STEEL TANKS provide storage facilities for many kinds of products used by industries throughout the West. The 35,000-bbl. tank shown above is used to store fuel oil for Fibreboard Products, Inc. at Port Angeles, Washington. It is 80 ft. in diam. by 40 ft. high. The oil is received by tanker, stored in the tank and is used as fuel. The plant produces groundwood and sulphite pulp, paperboard for cartons and shipping containers.

Horton welded steel tanks are built in standard capacities from 500 bbls. to 150,000 bbls. or they may be furnished in special sizes to meet individual requirements. Cone roofs, umbrella roofs, Horton Liquid Seal Lifter Roofs or Horton Double-Deck Floating Roofs are furnished, depending upon the characteristics of the product stored.

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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
February, 1948 Vol. 23, No. 2

What We Believe

LAST MONTH'S editorial page was written in the midst of a feeling of "sweetness and light," but judging from letters we've received, managed to convey a few meanings, too.

It has occurred to us, though, that as we write from month to month about practices we feel should be corrected, some of our new readers may not be familiar with the background of the subject, or of our position on it. So we've decided this month to review briefly some controversial subjects in our field. Our position on all of them can be summed up accurately by saying that we believe in the traditional American way of free enterprise and free expression, in the engineering as well as all fields. Specifically:

Reclamation

We're proud of the record of irrigation in the arid West, and hope that ultimately, through engineering skill, not one drop of fresh water will be wasted or one acre of irrigable land left dry in the whole Western half of the United States. The great private and district irrigation systems have achieved marvelous results. So has the federal Bureau of Reclamation under the direction of its great Commissioners Davis, Mead, Page, Bashore. What great names!

However, since the advent of socializers Ickes and Krug in the Department of the Interior, the confidence of engineers, farmers, and Western people generally in the Bureau and its activities has declined almost to extinction. Under Commissioner Mike Straus, who has no engineering training, but qualifies by being a newspaper man with so-called "liberal" political views, the Bureau has become an instrument for developing unhealthy public power, Regional Authority, land limitation, and political pressure policies.

The Reclamation Bureau has in fact become split into two bureaus—one, the engineering staff, centered in Denver, the other the administrative staff, centered in Washington. In the engineers, even with the inevitable decline of morale resulting from working under unsympathetic and untrained management, the West and Congress still have faith. In the Washington branch, no confidence remains. Our position is to support all worthwhile (and they are many) activities of the Bureau, while urging reorganization of the Washington office on the basis of solid American policies and trained personnel.

Electric power

We strongly support the construction of hydro-electric power generating facilities, whenever fall and quantity of water is suitable, by whatever agency—federal, municipal or private—has jurisdiction and is competent. In view of our sadly declining supplies of oil and coal, we stand for utilization of every other available source of energy. We **do** feel, however, that the power generated by government agencies should not be used as an agency to destroy private enterprise through construction of parallel transmission lines, or by its sale at unprofitable and subsidized rates so as to destroy competition at the expense of the taxpayer.

We believe any one of three solutions should be adopted: (1) Government facilities should be taxed equally with private electric companies; (2) Private companies should also be made tax exempt; or (3) Government electric sales should be priced on the same basis as if their facilities were taxed, and the resulting large profits placed in the public treasury.

San Francisco Bay

Almost monthly we make some reference to the confused situation concerning a second San Francisco Bay crossing. The great existing bridge has already reached its ultimate traffic density, originally estimated for about 1980. The State Toll Bridge Authority desires to build a second steel bridge parallel to the present one and about 300 ft. from it. An Army-Navy Board has proposed a roller coaster fill-tube-trestle-tube structure well south of the present bridge, at a site which will serve only limited traffic.

The Reber Plan, a system of dredged-fill dikes, would furnish the best traffic crossing, both in respect to number of traffic lanes, and also in direct connection of the points of heavy traffic origin. In addition, it would solve a hundred other Bay area needs, such as railroads in San Francisco, adequate fresh water for the area, military security, additional wharf area, fresh water anchorages for ships, new industrial lands, a grand central terminal, and many others. The cost is comparable to any bridge proposal.

We strongly feel it would be wasteful to construct another bridge, with only limited service possibilities, when this project would accomplish so much more than a bridge.

Labor

We were amazed to receive a letter the other day saying, "Until your editorial policy regarding organized labor is changed for the better," the writer would not renew his subscription. Of course, he'll never know if we **do** change unless he reads the magazine and he doesn't say whether we should be more **for** or **against** organized labor. We don't know what "for the better" means to him. Actually, however, we have taken no firm stand on the matter of organized labor. We believe in Unions, and want to see every worker receive adequate pay for his work. We cannot condone feather-bedding, however, in the construction or any other industry, or the practice of making every worker perform only as much work per day as the poorest workman can do. We believe the Taft-Hartley Act is generally a good law, for it takes away **none** of the privileges Labor has gained in recent years, and in fact adds some new rights, and it also gives to the employer some of the privileges previously enjoyed by the worker only.

Politics

We haven't any. We judge men and issues solely on the basis of their conformity to true Americanism. We wrote complimentary editorials on both President Truman and Secretary Krug on their ascension to their offices, and had great hopes for them. Both have fallen far below our expectations, and not because of their politics, but because of their policies, we felt it necessary to write editorials of censure once or twice.

Appropriations

President Truman has recently presented the second largest peace-time budget in history. We haven't had a chance to study it in detail, of course, but we urge Congress to consider favorably those engineering and construction budgets which are so necessary to the West: Flood Control, Soil Conservation, Public Roads, Geological Survey, Reclamation, Federal Works Agency planning funds, Civil Aeronautics, etc. At the same time, we urge sharp curtailment of useless federal bureaus, paternalistic schemes such as TVA, and fantastic schemes for giving billions to foreign countries who will only curse us, while continuing to live in socialism and beggary. To such extent as we can supply them with seeds and machines to rebuild their shattered economies, we agree, but to attempt to buy peace with gifts of money to ungrateful governments, we strongly demur.

Around these principles, our editorial policy is built.

1878 - 1948

99-H

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★ ★ ★ **Culmination of 70 Years of Grader Manufacturing**

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The "99-H" pays maximum dividends day in and day out, year in and year out. No other machine will do *so many* highway construction and maintenance jobs *so well.* Your nearby Austin-Western distributor will be glad to tell you the whole story.

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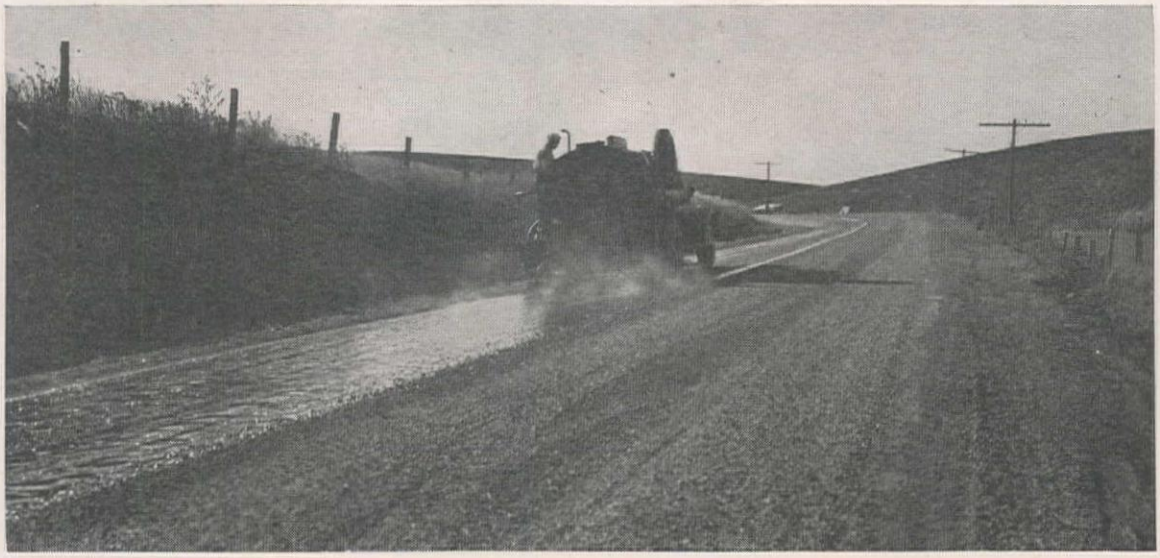


NEARLY COMPLETED section of the Oakesdale-Tekoa soil-cement highway work. Bituminous cement was applied to the finished soil-cement in three courses, the first being a seal, covered with sand. Wearing surface is MC-2, covered with 5/8-minus rock.

Soil-Cement Paving—
Entire Job Mechanically Performed

Washington Department of Highways convinced of value of soil-cement paving from 9-year observation of 1-mi. experimental roadway—New 10-mi. section laid using mechanical means throughout, including scarifying, shaping, windrowing, pulverizing, cement spreading, mixing, compacting and final bituminous surfacing

By B. L. HUFFMAN
Resident Engineer
Washington State Highway Dept.
Colfax, Wash.

IN CONSTRUCTING the third and largest section of soil-cement highway in the state of Washington, the contractor developed a new type of cement spreader which constituted a major improvement over the previous hand methods of spreading by permitting the use of bulk cement in place of sacked. The project was of special interest too in that the first experimental project, consisting of one mile of soil-cement roadway constructed in 1938, bisected the 1947 project.

Work began on the current project on June 30, 1947, and was completed on Oct. 11, 1947. It consisted of constructing a 20-ft. wide by 6-in. thick soil-cement mat with a bituminous wearing surface on 9.94 mi. of secondary state highway No. 3-H between Oakesdale and Tekoa in Whitman County, eastern Washington. One mile of experimental soil-cement roadway 18 ft. in width was constructed in 1938 using heavy-duty, mixed-in-place equipment with cement being spread by hand from sacks.

This section of road, midway between Oakesdale and Tekoa is still in excellent condition after 9 yr. of use. This record of proven service greatly influenced the Department of Highways in the decision to construct a larger project.

Initial preparation for the 1947 project, such as grade lifts, installation of new culverts, and ditching work was done by state highway maintenance crews prior to awarding of the contract. McAtee & Heathe, general contractors of Spokane, were awarded the contract on a low bid of $112,560.

Trench and windrow

The first operation on the job undertaken by the contractor was the addition of 1,800 cu. yd. of crushed stone surfacing with a top course of 5/8-in. minus material on portions lacking in mineral content. The entire roadway was then scarified and shaped with No. 12 Caterpillar patrol blades to the line and grade of the roadway section shown on the plans. Where necessary the shoulders were then compacted by a pneumatic wheeled roller with the addition of water.

Line for one side of the soil-cement trench was then established from offset stakes previously set. The entire operation of moving material from the trench into a windrow for the mixing machine was accomplished with patrol blades as follows:

The first cut along the staked line was made by a patrol with the blade tilted, making a second pass where necessary to true up the alignment. By scarifying and blading the material from one half of the soil-cement trench was removed to a true trench section 5½ in. in depth, and placed on the unprepared side of the roadway. After the trench was checked for depth and crown, the previously excavated material was moved back into a windrow on the prepared subgrade.

The opposite side was then prepared in a similar manner and excavated material added to the windrow, which was left near the edge of the trench so that hauling equipment could pass along the opposite subgrade. The cross section at this point was similar to Figure A which is exaggerated in scale.

Pulverization

Considerable pulverization of the existing soil was obtained by the action of the

CEMENT IS SPREAD on flattened windrow by toboggan-like spreader box attached to the back of a cement dump truck, upper right. Trench and windrow with cement added awaiting approach of mixer, upper left. Cutting of trench and windrow shaping is performed by motor graders. Another view of cement truck and spreader box, below, with grader following to reshape the windrow.

patrol blades and scarifier teeth. A Seaman rotary pulverizer was used for additional pulverization in the smaller windrows formed by the patrols while moving the material from the soil-cement trench.

Dry, hardened clay clods were rather difficult to break, even with the addition of water to the windrow because of the high clay content, and some went through the mixing machine unbroken. These clods seemed to cause very little trouble by swelling after compaction of the mat, due no doubt to the length of time they remained in the prepared windrow after mixing with cement and water which allowed time for the absorption of moisture.

Cement distribution

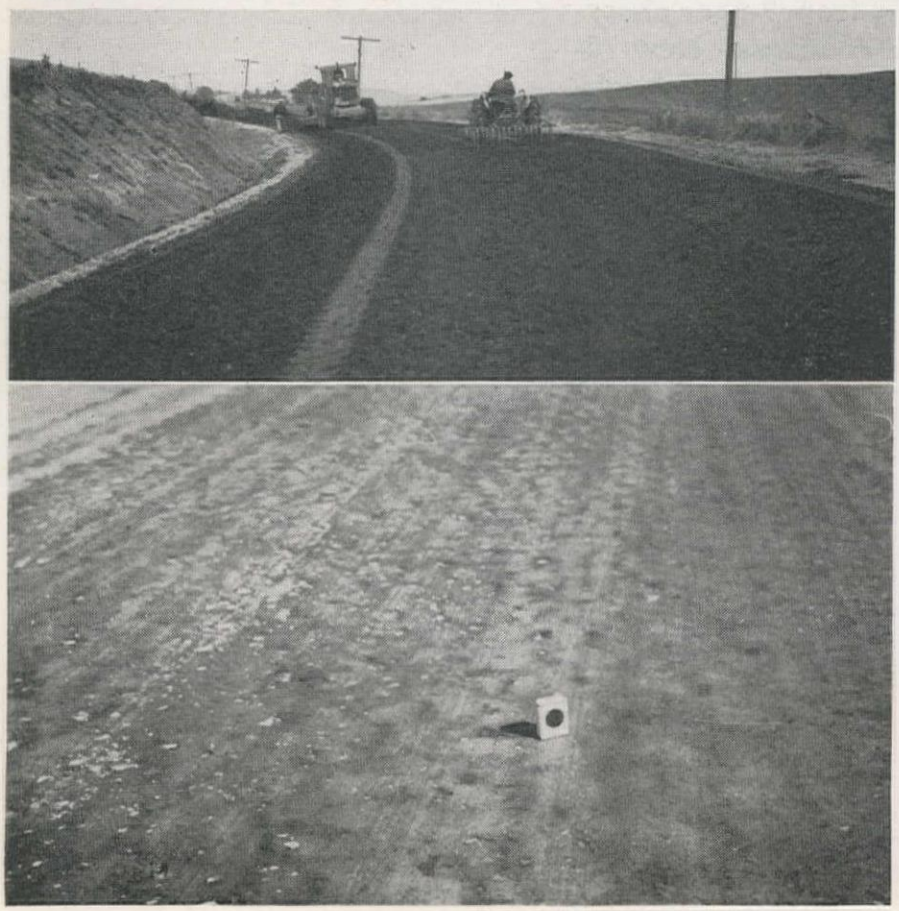
For cement spreading operations a portion of the windrow was flattened out to form a smooth, flat, operating surface similar to the cross section shown in Figure B. Bulk cement, shipped to the project in standard bulk cement cars, was hauled in 6-cu. yd. dump trucks, loaded by a cement hog at one centrally located rail siding, and was distributed from a specially constructed spreader box.

This spreader box, towed by a dump truck, consisted of a hopper of 90-cu. ft. capacity. It had an adjustable rectangular opening 45 in. in width at the rear with an open bottom in the form of a triangle. This hopper was mounted on a full width steel runner, comparable to a toboggan, and carried a strike-off plate mounted just above the rectangular opening. This strike-off plate prevented the bulk cement from rolling out of the opening before the box was in motion.

A uniform spread resulted from the use of this spreader box which permitted changing the amount of the cement by adjusting the opening. A content of 7 to 11 per cent by volume was used on this project, these percentages based on compacted dimensions. Each truck load was measured and its volume computed on its arrival at the spreader box; the length of spread was then measured by chaining.

Mixing

Load volumes were also checked with the railroad weights which were used as the basis for payment. Immediately behind the cement spreader, a patrol blade rolled the cement and soil back into a peaked windrow, ready now for the mixing machine.



SHAPING SURFACE with motor grader, upper of bottom pictures, showing finger weeder following behind to remove tire tracks prior to final finishing. Surface shows smooth, dense characteristics after final rolling by multi-wheeled pneumatic roller, bottom.

Some settlement difficulty was encountered due to trucks hauling cement over the prepared soil-cement trench. Weaknesses of the subgrade were immediately apparent and required stabilization to extra depths. Material for this stabilization consisted of 10 per cent mixed with mineral aggregate from ¼-in. minus, and this proved to be most effective for the smaller breaks with an extra depth of crushed stone surfacing required for the larger subgrade settlements.

A Barber-Greene mixer model 848 with model 82A loader traveling at 5½ ft. per min., picked up the material from the windrow, added water, mixed the soil and cement, and deposited the mixed material in a windrow at the rear. Even distribution of the cement and soil was found in the loader buckets due to the mixing action of the loader augers. Further mixing in the 8-ft. long pugmill after the addition of a metered quantity of water yielded a well mixed mass of soil-cement which left the machine slightly above the optimum moisture content to allow for windrow evaporation.

Compaction

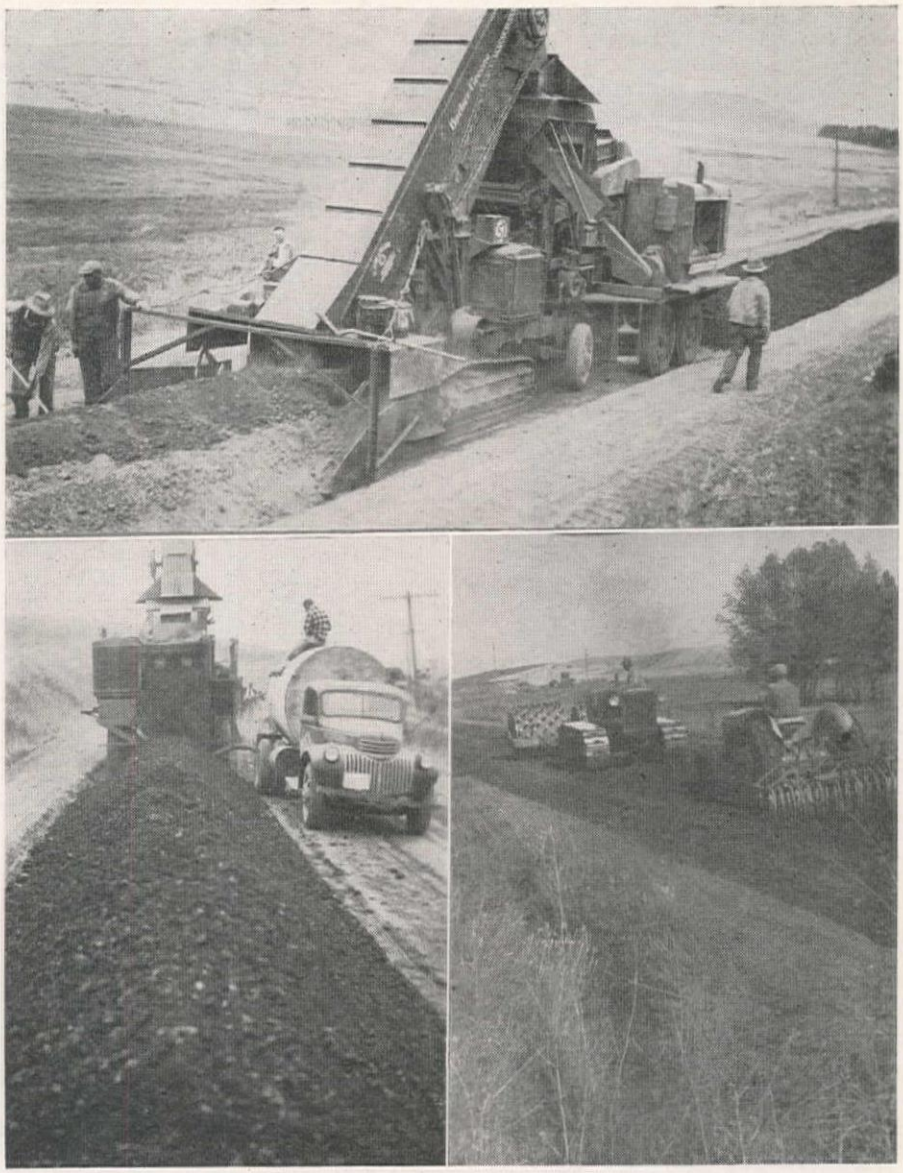
Upon completion of a section of approximately 400 to 500 ft. of mixed and windrowed soil-cement, it was then spread and shaped by a patrol blade. The full 20-ft. width was then thoroughly loosened by use of a cultivator attachment on a Fordson tractor. On the loosened mat a sheepsfoot roller with 7-in. teeth bearing 295 psi. and towed by a 40-hp. track-type tractor began compacting from the bottom, operating until at least the bottom 4½ in. of depth was thoroughly compacted.

Additional applications of water were required with each compacting operation to maintain the required optimum moisture content. These applications were made with both gravity type and pressure type distributors. A finger weeder attachment on a Fordson tractor worked along with the sheepsfoot, tilling and removing equipment tracks. Final shaping of the soil-cement mat was then made by a patrol blade, followed immediately by a 10-ton smooth steel wheeled roller.

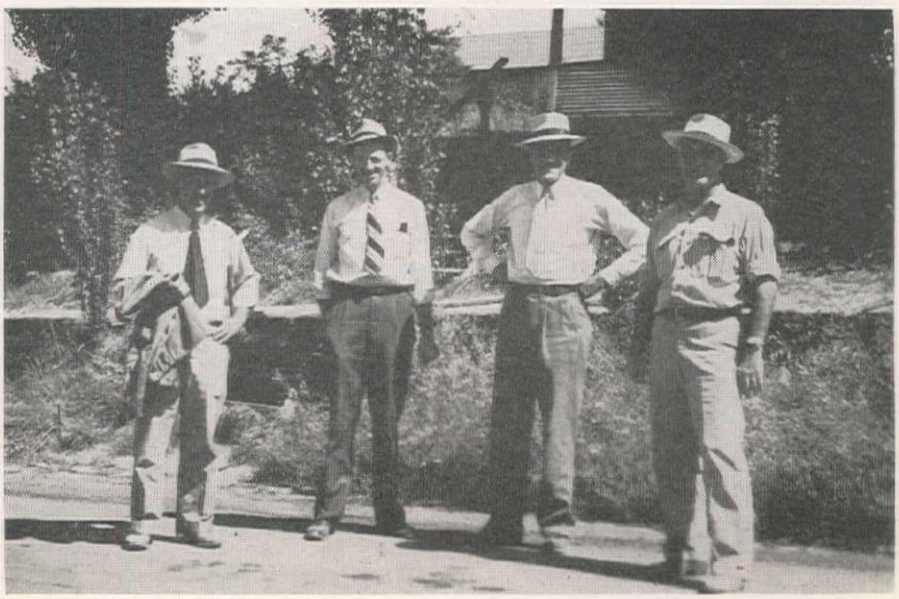
A fine spray of water was applied by pressure distributor during finishing operations to prevent surface drying. Final rolling was done with a multiple wheeled pneumatic roller, gross weight 11,120 lb. (32-lb. tire pressure), which continued until a smooth, dense, closely knit surface was obtained. Approximately 45 min. of rolling were required for each 500-ft. section. The finished portion of a daily operation was at all times kept moist by applications of water from the pressure distributor.

Bituminous surface

The following morning after a light application of water bituminous cement, MC-2, was applied as a curing coat to seal in the moisture. This was applied at the rate of 0.2 gal. per sq. yd., and was covered with either sand or crushed stone from ¼-in. minus at the rate of approximately 50 cu. yd. per mi. to act as a blotter and to prevent displacement



WINDROW MATERIAL to which cement has been previously added is picked up by loader and deposited in 8-ft. pugmill of the mixer, top. Loading augers distribute cement evenly through the soil. Mixed material, with slightly more than optimum water content, is discharged from the mixer into a windrow at side of trench, above left. Compaction by sheepsfoot roller, above right, with finger weeder following to remove equipment tracks. Personnel included, l. to r.: J. A. LIEDABRAND, Portland Cement Assn., Chicago; R. E. TOBIN, Portland Cement Assn., Spokane; P. G. HAHN, Lehigh Portland Cement Co., Spokane; F. L. McATEE, McAtee & Heathe, Spokane.



by hauling equipment. Two more applications of bituminous cement with ⅝-in. minus crushed cover stone formed the completed riding surface.

A small portable laboratory was moved along daily as the work progressed. One man working full time kept abreast of the moisture content and density tests required. Through traffic from Oakesdale to Tekoa used a detour provided over county roads approximately 2 mi. to the south. Local traffic was routed around the work on various county roads in the vicinity. Flagmen were stationed at each end of the project at all times during soil-cement operations.

This project constitutes the first major soil-cement construction by the Washington Department of Highways since the experimental sections of 1938 with the exception of a 3½-mi. road south of Fairfield built in 1941 in southern Spokane County. It is evident that special conditions will arise with each project which will have to be worked out as was done on this one.

Further refinements in construction and finishing operations would undoubtedly improve the riding qualities of the roadway, but this writer feels that we did obtain excellent results by the methods which were used. The Oakesdale to Tekoa project should remain a very durable highway for many years to come.

Organization

Plans for the project were prepared and construction was supervised by the Washington Department of Highways of which Clarence B. Shain is director of highways. The writer served as resident engineer, representing district No. 6 of which J. Roy Tillman is district engineer. Arthur P. Sinclair, laboratory technician at district No. 6 headquarters in Spokane, was loaned especially for this project.

For McAtee & Heathe Construction Co., Spokane, Edward J. Hixson was superintendent in charge of the project. The Colonial Construction Co., Spokane, served as subcontractor for the production and stockpiling of 10,000 cu. yd. of crushed stone for surfacing material. Cement, of which 10,430 bbl. were used on the project, was supplied equally by the Lehigh Portland Cement Co., and the Spokane Portland Cement Co.

Annual Report of REA Indicates All-Time High in Electric Service

CONNECTIONS of farms and other rural establishments by power systems financed by the Rural Electrification Administration and consumption of electricity by the people they serve both reached all-time highs in 1947, according to the Department of Agriculture. During the year, central station electric service was brought to 346,000 farms and other rural establishments. This is 71,000 more consumers than were added to the systems in 1946.

Funds advanced by REA to finance the construction program amounted to $219,270,000 during 1947, exceeding by $87,000,000 the funds advanced in any previous year. In addition to 87,000 mi. of distribution lines that were energized during the year, the construction program included increasing the capacity of many miles of line to handle increased loads and also the construction of additional generating facilities.

REA borrowers include 947 rural electric cooperatives, 41 public power districts, 20 other public bodies and 21 private power companies. At the close of the year, they were operating an estimated 594,000 mi. of lines serving approximately 2,030,000 rural consumers. The annual energy usage per consumer on REA-financed lines increased 12 per cent during 1947, from 1,602 kwh. to 1,794 kwh. The average electric bill per consumer increased from $57.61 to $61.18.

Total electricity purchased by REA groups from commercial and public power sources amounted to 3,695,000,000 kwh. in 1947 and energy generated by 77 organizations with their own generating facilities amounted to 394,000,000 kwh.

The annual REA survey of electrified farms in 1947 indicated that approximately 2,280,000 U. S. farms or nearly 40 per cent of the nation's total, still lacked electric facilities. This figure does not include such rural establishments as churches, schools, stores and rural industries.

At the end of the year the total loan allocations since the establishment of REA amounted to $1,192,000,000 and funds actually advanced amounted to $815,000,000. In the same period $152,000,000 has been repaid to the Government in principal and interest, including $19,800,000 in advance principal payments. As of Dec. 1, 1947, $1,035,000 was more than 30 days overdue.

Loans approved for borrowers in the Western States in recent weeks include those listed below. In every case the funds are to be used to finance construction of rural electric facilities and such construction will start as soon as materials can be secured.

Colorado

To the Delta-Montrose Rural Power Lines Assn., Delta, $256,000 for completed construction with prior REA approval and for 89 mi. of transmission line; to Sangre de Cristo Electric Assn., Salida, $330,000 for 173 mi. of line, and to complete previously approved construction.

Kansas

To Ark Valley Electric Cooperative Assn., Hutchinson, $140,000 for system improvements, completion of previously approved construction and 57 mi. of distribution line.

Montana

To Hill County Electric Co-op., Havre, $420,000 to complete approved construction and for 100 mi. of new line.

Nebraska

To Custer Public Power District, Broken Bow, $770,000 for 373 mi. of distribution line, 3 mi. of transmission line, and acquisition and rehabilitation of 30 mi. of line in the towns of Mason City, Litchfield and Hazard.

New Mexico

To Mora-San Miguel Electric Co-op., Mora, $475,000 for 295 mi. of distribution line and for the acquisition and rehabilitation of 9 mi. of line now owned by the Mora Public Service Co.

North Dakota

To Williams Electric Co-op., Williston, $350,000 for 132 mi. of line and to complete previous construction; to Burke-Divide Electric Co-op., Crosby, $350,000 for 147 mi. of line and completion of previously approved construction.

Oklahoma

To Northfork Electric Co-op., Sayre, $421,000 for 49 mi. of line, for system improvements, and completion of previous construction; to Northwestern Electric Co-op., Woodward, $900,000 for rehabilitation of the Buffalo, Okla., distribution system, purchase of a portable generating unit to supplement the Buffalo facilities, 72 mi. of transmission line and 265 mi. of distribution line; to Cotton Electric Co-op., Walters, $455,000 for system improvements, 17 mi. of transmission line and 193 mi. of distribution line; to Southwest Rural Electric Assn., Tipton, $500,000 for 280 mi. of line and completion of previous construction.

Oregon

To Lane County Electric Co-op., Eugene, $450,000 for 120 mi. of line and for completed construction with prior REA approval.

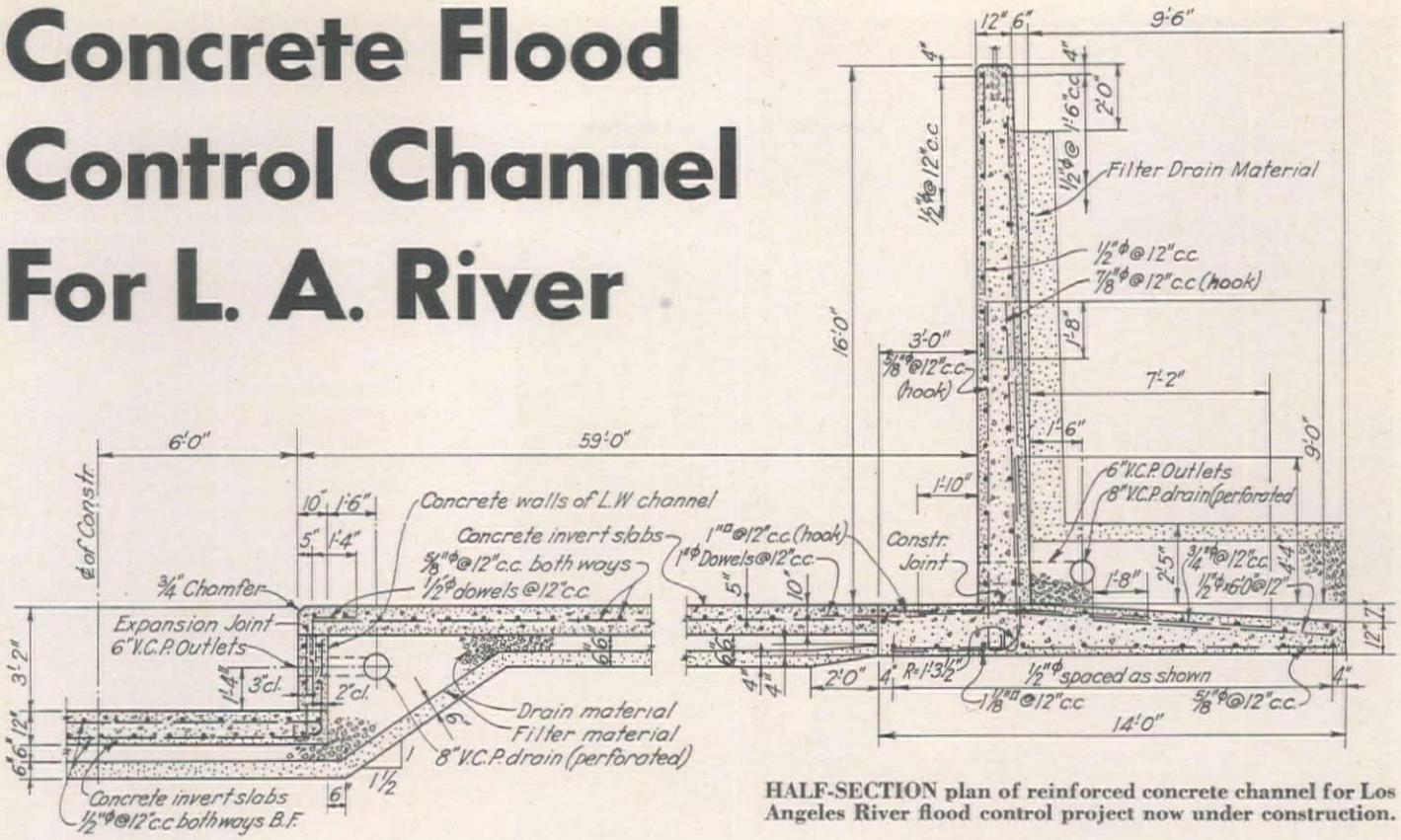
South Dakota

To La Creek Electric Assn., Inc., Martin, $585,000 for generating facilities and 266 mi. of line, including acquisition of 6 mi. to existing line; to West River Electric Assn., Wall, $385,000 for 232 mi. of line.

Texas

To DeWitt County Electric Co-op., Cuero, $50,000 for 40 mi. of line; to Lamb County Electric Co-op., Littlefield, $210,000 for system improvements and for 146 mi. of distribution lines; to Grayson-Collin Electric Co-op., Van Alstyne, $170,000 for system improvements and 120 mi. of line; to Greenbelt Electric Co-op., Wellington, $428,000 for construction of 350 mi. of line and acquisition and rehabilitation of 16 mi. of existing line; and to Farmers Electric Co-op., Greenville, $432,000 for system improvements and construction of 245 mi. of line; to Gate City Electric Co-op., Childress, $310,000 for 238 mi. of line and for system improvements; to Hunt Collin Electric Co-op., Greenville, $115,000 for 83 mi. of line.

Concrete Flood Control Channel For L. A. River



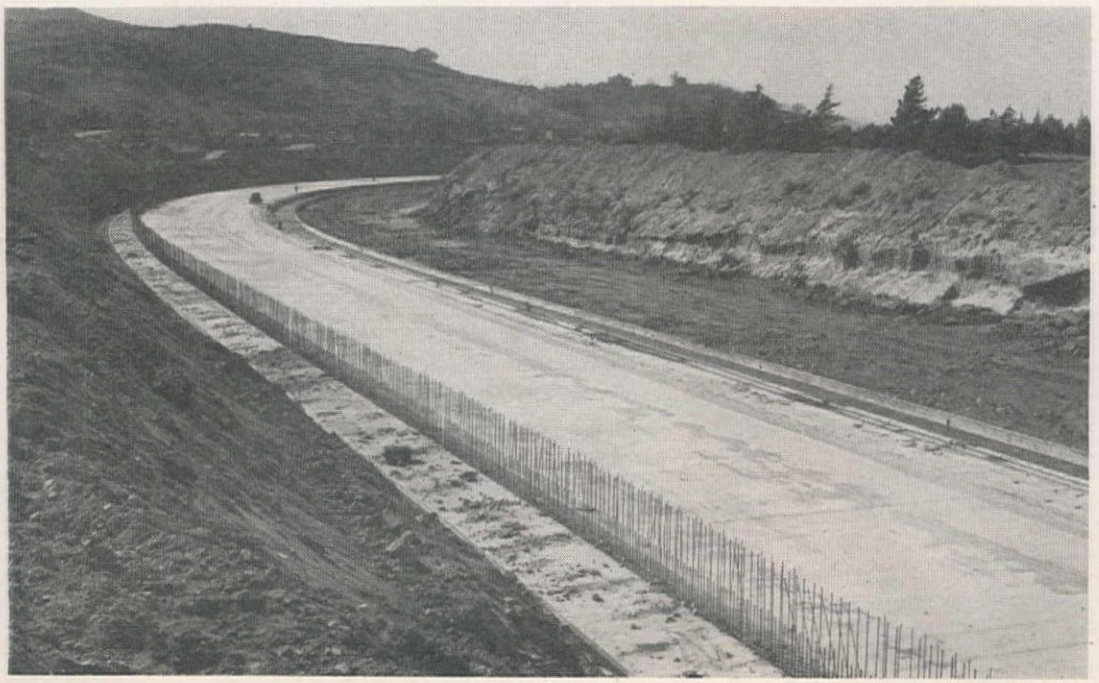
HALF-SECTION plan of reinforced concrete channel for Los Angeles River flood control project now under construction.

AIDED by the continuation of unexpectedly moderate winter weather, United-Vinnell-Bell, a joint venture contracting firm, is rapidly bringing to a conclusion its $2,496,202 contract for improvement of the Los Angeles River channel between Lankershim Blvd. and Niagara St. The work consists of 9,000 ft. of rectangular reinforced concrete box section, generally 130 ft. wide and 16 ft. deep, with a 3 x 12-ft. low-water channel in the center, and additions to the Barham Blvd. bridge.

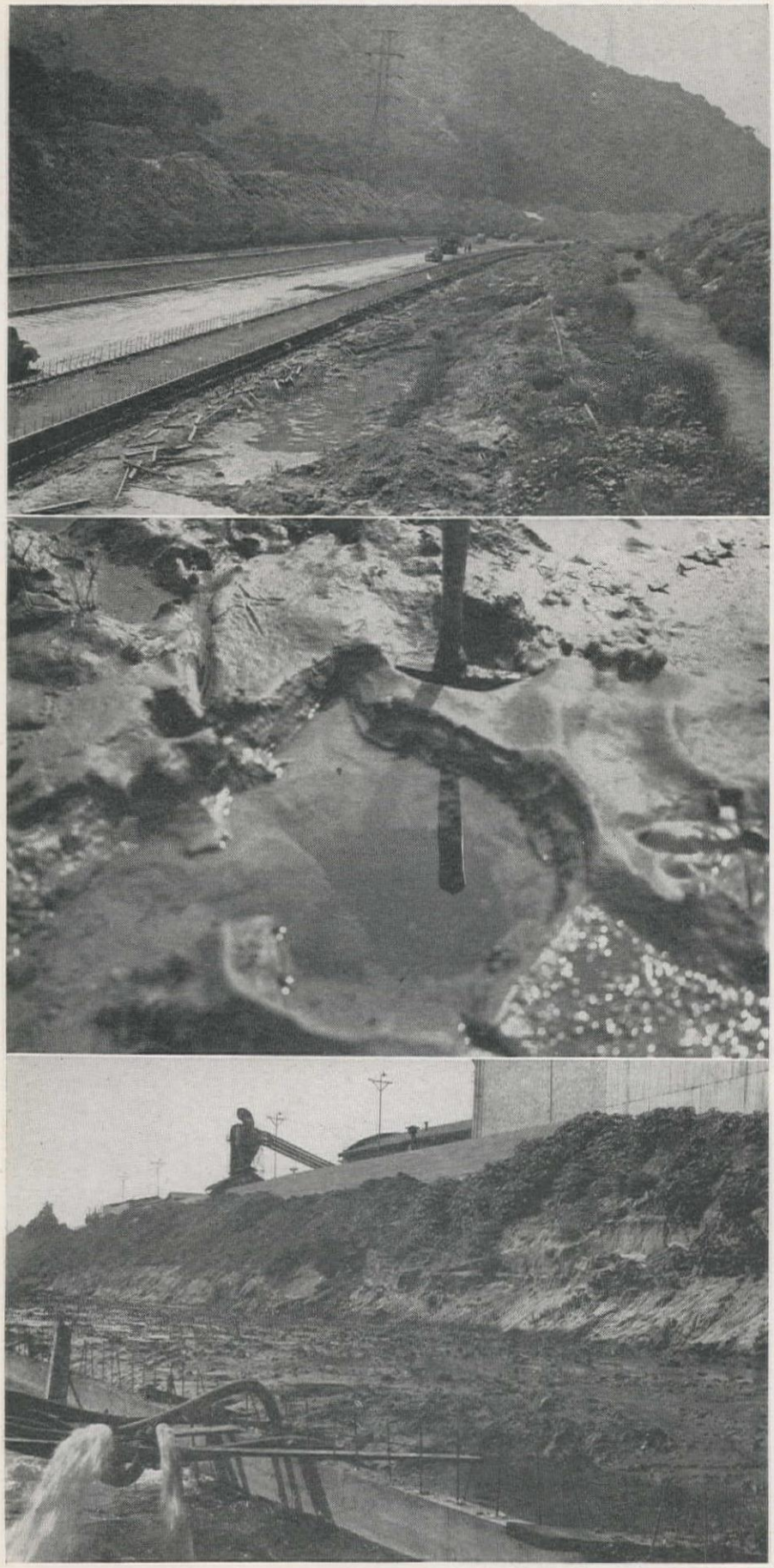
The work, designed by the Los Angeles District of the Corps of Engineers, was awarded to the combination firm of United Concrete Pipe Corp., Vinnell Co., Inc. and Ralph A. Bell early in the spring of 1947, and the construction operations commenced on April 25.

Springs complicate excavation

Excavation was complicated by the discovery of more than fifty live springs in the floor of the river channel. The normal flow of the river was diverted into a temporary channel along the left bank while excavation in the main channel proceeded. However, the flow of spring water was so great that it was necessary to install pumps at various sumps to remove it from the working area. As an evidence of the quantity of water involved in the spring flow, approximately 14 cu. ft. per sec. flows in the channel at the upper end of the work. However, at the outlet end of this section, 9,000 ft. downstream, the flow amounts to 27 cu. ft. per sec. This naturally caused some difficulty in the operation of heavy equipment until blankets of crushed rock were placed over the boggy spring areas.



HALF-SECTION of flood control channel completed on the ground, except for wall, but with wall reinforcing in place. Cross-section compares with sketch above.



FLOWING SPRINGS were a major problem to the contractor on the L. A. River job, with about 13 cu. ft. per sec. of water bubbling up in the working area. First operation of the contractors was to construct a diversion ditch to carry normal summer flow of the river, top. Typical spring in the bottom of the river, partly bubbling, partly flowing, center. Water from spring area is removed from the spring area by pumps discharging into the low water channel, which was the first completed part of the job.

The first concrete placed was for the low-water channel along the centerline. Upon the completion of this structure the residual flow of the river was diverted through it and flow from the springs was pumped into it.

Before the main floor slabs were poured a 12-in. blanket of filter drain material was placed over the entire excavated surface and in addition numerous transverse rock-filled French drains were installed under the slab, particularly under the slab forming the left half of the channel, where spring flow was the most troublesome.

As finally installed the drainage system consisted of an 8-in. vitrified clay pipe drain along the back side of the wall and 6 in. above the top of the footing with openings into the main channel at 50-ft. intervals, and also 6 in. perforated metal pipes approximately every 50 ft. under the slab, emptying into the low-water channel. The rock-filled French drains lead from each of the definable springs to one of these latter pipe drains for discharge into the low-water channel.

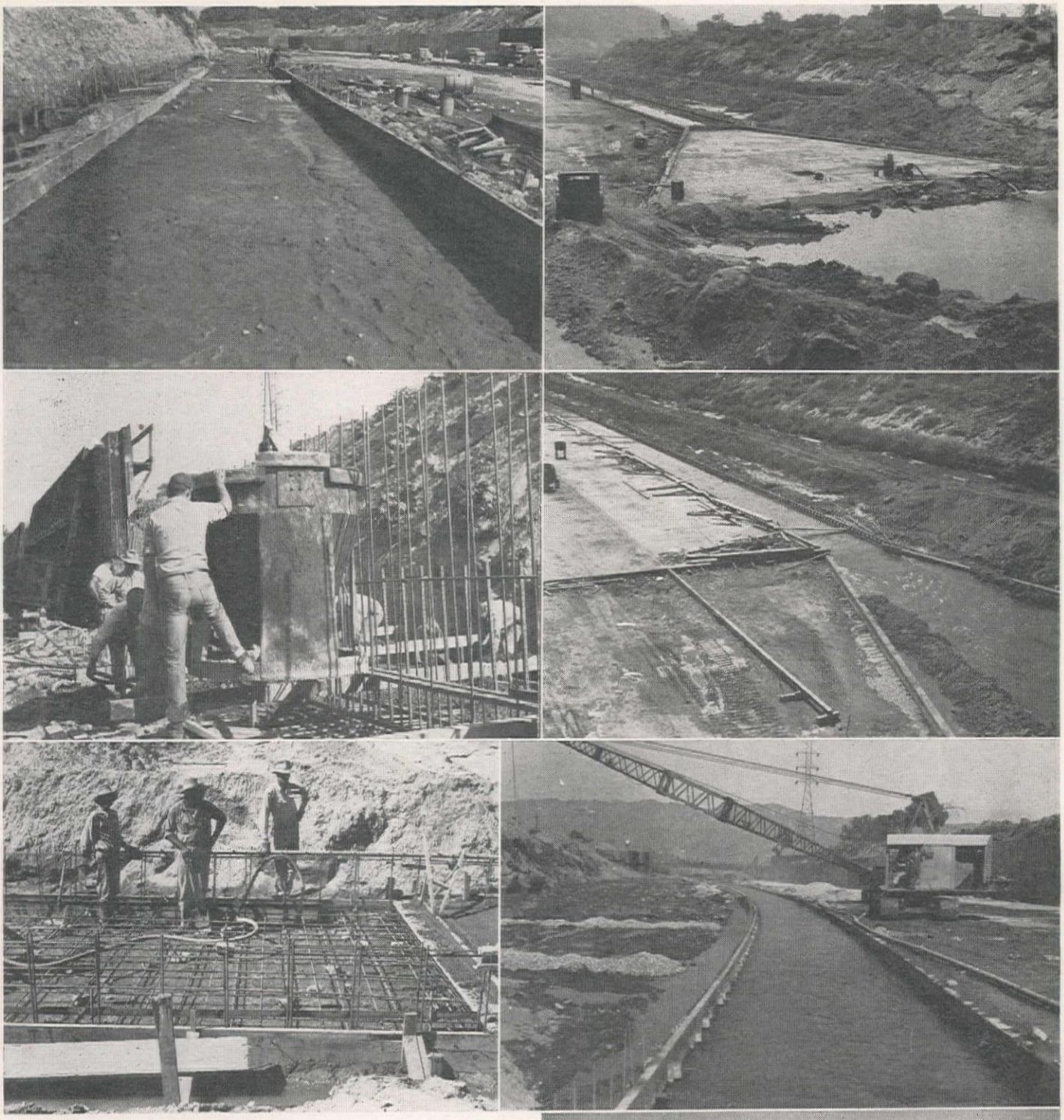
Cross-section

In cross-section the channel is a rectangle with a depressed rectangular section at the center. The invert of the depressed low-water section is 12 in. thick, reinforced with two layers of ⅝-in steel rods placed 12 in. on center both ways. The vertical wall at the sides of the low-water channel is 10 in. thick, with similar spacing for reinforcing steel. The floor of the main channel is 10 in. thick, with a single layer of reinforcing steel at the center consisting of ⅝-in. bars 12 in. on center each way. The floor is perfectly flat except on curves where a slight super-elevation is introduced. In all parts of the channel, except under the Barham Blvd. bridge where the total width is increased to 160 ft., the width of the floor slab is 56 ft. on each side of the low-water channel and it is doweled into the wall footing at is outside edge.

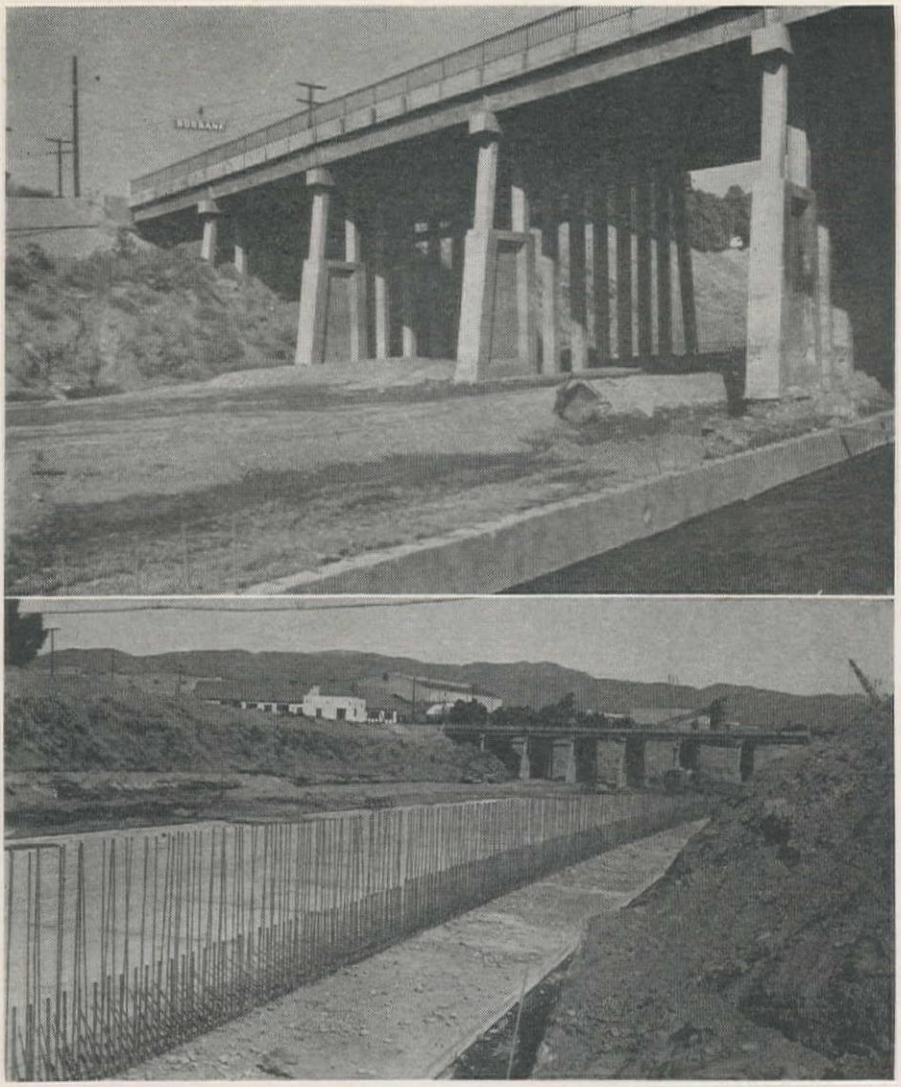
The procedure in pouring was to place the vertical wall of the low-water channel to the level of the bottom of the floor slab. Dowels emerging from the top of this vertical wall were bent into the plane of the floor slab which was poured later. The dowels were ⅝-in. steel on 12-in. centers. Dowels of 1-in. steel on 12-in. centers were used to connect the floor slab with the wall footing and also at transverse construction joints in the slab.

The wall footing for a typical 16-ft. wall was 14 ft. wide and 19 in. thick. The inside, or channel face of the wall is vertical and is located 3 ft. from the inside end of the footing, thus making a total half-channel width of 65 ft.: 6 ft. in the low-water channel, 56 ft. of floor slab, and 3 ft. of footing forming a continuation of the floor slab.

At its base the wall is 18 in. thick, but tapers to 12 in. at the top. It is reinforced with ⅝-in. bars on 12-in. centers on the inside face and the bars varying from 1⅛ in. square on 12-in. centers near the base to ⅝-in. round on 18-in. centers near the top on the outside face. The thickness of the footing tapers from 19



CONSTRUCTION SCENES on the Los Angeles River flood control channel: placing forms for wall footing, upper left; placing concrete in footing block from concrete bucket handled by long-boom mobile crane, center left; vibrating concrete in floor slab of the central low water channel, bottom left; outlet of low water channel, upper right, this channel being the first portion of the project completed—it fans out transversely and feathers out to grade in the downstream 200 ft. of the channel; water being by-passed in the low water channel while right side floor slab of the main channel is poured, second right; mobile crane places crushed rock in French drains to conduct water away from spring areas underneath floor slab, and discharge it through weep holes into the low water channel, third right; paver operating on the bank delivers concrete for floor slab and walls of the central low water channel, bottom right. The order of concrete operations on the job was first the low water channel, then wall footing and floor slab on left bank, then same on right side, then walls on both sides.



BARHAM BLVD. bridge was the only major crossing structure on the project. Its concrete piling was not disturbed, but a heavy concrete footing block was poured around the bottom of each bent, and diaphragm sections (first units poured in picture) are to be built to height of channel wall, top. Cantilever toe of wall section was poured before the wall, with dowels and reinforcing steel left protruding upward, bottom.

in. under the wall to 12 in. at its outside extremity. It is strongly reinforced to provide suitable cantilever action for the walls.

Back-fill over the outside toe of the footing consists of 2 ft. of crushed rock covered with 6 in. of filler drain material and a 12-in. layer of filter drain material extending up the outside of the wall to within 2 ft. of its top. Against these porous blankets normal excavated material is back-filled and compacted.

Pouring procedure

The contractors' procedure in pouring the concrete work was first to complete the low-water channel through the entire length of the project so that water could be diverted. Next, the wall footing along the right bank was completed for its entire length with reinforcing bars and dowels left protruding for later inclusion in the walls. Next, the entire right floor slab was poured and this was followed by the left footing and slab in order. Pouring of the walls commenced at the lower end of the project and proceeded upstream more or less simultaneously on the two sides. The only section omitted from this procedure was that immediately under the Barham Blvd. bridge, where special designs were installed.

Aggregates were batched at a plant on the right bank near Barham Blvd. and transported by batch truck to pavers situated on the floor of the channel. For the slab a double drum paver was used and a single drum machine was used for the walls. Prefabricated steel forms were used for the walls, with six sets, each measuring 52 x 16 ft. being placed and filled with concrete. They were stripped after 36 hr. and moved ahead to the next location. Where the walls were less than 16 ft. in height the concrete was merely topped off at the proper elevation, and in several spots where the walls were 18 ft. high, plywood form extensions were fastened to the steel forms.

For a portion of the job a self-powered belt conveyor was used to elevate the concrete from the discharge lip of the paver to the top of the wall forms; in other sections the concrete was conveyed from the mixer to the walls in buckets lifted by a mobile crane. Concrete in the lower sections of the wall was vibrated by pneumatic vibrators attached to the outside of the steel forms, but the upper sections were compacted by pneumatic vibrators lowered directly into the concrete. An experiment in curing which proved successful was to spray the curing compound onto the surface of the forms before placing the concrete.

Barham Blvd. bridge

No structural changes were made in the Barham Blvd. bridge. It is of simple design, being a slab bridge supported on eight bents of nine 18-in. square reinforced concrete piling each. These piles were not disturbed, but an additional concrete footing base was poured around the bottom of each bent and concrete diaphragm walls poured between each of the piling to a height of 16 ft. 4 in. from the floor of the channel. These diaphragm walls were not doweled into the existing piling, but reinforcing steel was looped completely around the existing piling and a 6-in. layer of concrete poured around them. Between the piling the wall thickness was 12 in.

The close proximity of the project to the studios of Universal Pictures Company, Inc., brought about the necessity for a working agreement with that company. At any time the studio was filming sound pictures on one of the stages near the channel, the work of heavy equipment was shut down until the scene was completed. A system of flag and whistle signals was devised to convey to the construction men the status of the filming. In such instances of work interruption the studio would reimburse the contractors for time lost by equipment and the workmen.

Organization

The channel project is a portion of the Los Angeles River flood control program being constructed under the direction of the District Engineer in Los Angeles. Downstream, this section joins an existing improvement, and the contract for a new 2.3-mi. section was recently awarded to Bressi-Bevanda Constructors, Inc.

Right-of-way was procured by the Los Angeles County Flood Control District, of which H. E. Hedger is chief engineer. The District Engineer for the Corps of Engineers in Los Angeles is Col. A. T. W. Moore, and Lt. Col. J. O. Killian is executive officer. W. J. Leen is chief of operations for the District and Edward Koehm is chief of the flood control design section. Resident engineer on the job is J. G. Morgan.

For the contractors, Roy Chinnici is general superintendent, Kenneth Norwood is job engineer and Hugh Clemens is office manager.

RAMONA FREEWAY, proposed main traffic artery to pass through Pomona, Calif., has been definitely located on a route north of the Los Angeles County Fairgrounds by action of the City Council. The decision was reached despite suggestions by a representative of the State Highway Commission that the city lacked authority in the matter. The State had proposed a route south of Ganesha Park along San Jose Creek, through a developed residential district.

Inflation Hits Adobe Block

Price of sun-dried adobe block in the Southwest has more than doubled since early days of World War II — Concrete brick is replacing adobe as the desert home building material in New Mexico and Arizona

By HOWARD KEGLEY
Los Angeles, Calif.

INFLATION HAS finally hit adobe, the poor man's building material. Through the last two decades, the price of sun-dried adobe blocks in New Mexico and Arizona averaged about $15 per 1,000 blocks. They were made by Mexican and Indians who gained a somewhat precarious livelihood by fashioning adobe building material for city-dwellers who wished to build the typically desert homes.

Many of the young Mexicans and Indians were called into the service during World War II, and most of the other able-bodied men went into war work. Wages went up until men who understood the art of making adobe blocks were earning five to ten dollars a day in other lines.

Prices climb

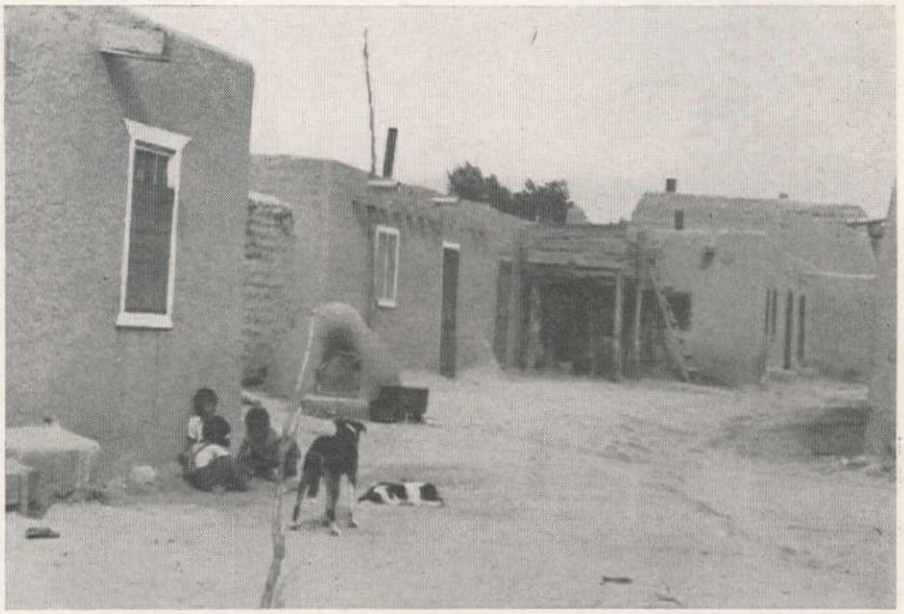
The price of adobe blocks climbed to $40, then $70, per 1,000. Now, it is quoted at $90. A private citizen building a residence at Tesuque, New Mexico, last year, stopped buying blocks at that price believing that he could manufacture them more cheaply himself. He employed two experienced Indians and put them to work. Within a short time, he discovered that the cost of his material was more than the customary market price. He concluded that it was not economical to build with adobe unless he made his own blocks during spare time.

Many people who had planned to build with adobe are changing over to concrete bricks. But concrete brick is in so great demand at such places as Santa Fe and Albuquerque that the supply is short and builders bid up the price to get them away from competitors.

The only people who still can build economically with adobe are the Mexicans and pueblo Indians. The pueblo dwellers, who have upwards of 20 villages in New Mexico, make adobe blocks in their spare time. The cost to them is no more than the food they eat.

Making adobe blocks

The favorite Indian method for manufacturing adobe blocks is to excavate a pit four feet wide, ten feet long and three feet deep. They fill this partly full of water. They then scoop up the adobe topsoil earth and dump it into the pit from wheelbarrows. While some are dumping adobe into the pit, others get in and trample the wet material until all the lumps have been dissolved. The earth becomes a thick, workable mass.



TYPICAL ADOBE construction in the pueblo of San Juan, 20 mi. from Santa Fe in New Mexico. The houses, though cheaply built, are thick-walled, have cool interiors.

The mud is then shoveled into wooden molds, the surface is smoothed with the edge of a board, and the mass is allowed to set. After the blocks have dried in the mold for a day or two, they are stacked on end in the sunlight where the air can circulate between them for curing. Most of the bricks are molded to a dimension of about 9 x 18 x 4 in.

Instead of using straw for a binder as the white man does the Indian mixes in small quantities of low-grade goat hair. This simple but practicable method has persisted since the early cliff-dweller days.

The Indians generally build their walls with a width of two blocks and use adobe mud for mortar. This 19-in. wall keeps the building surprisingly cool. Common practice is to plaster the building on the outside with adobe mud. Some of the pueblo buildings thus treated have withstood the elements for centuries with only an occasional touching up.

White people in towns throughout the Southwest, particularly in Santa Fe and Albuquerque, finish their adobe dwellings with stucco. Stucco will not bond to adobe. One way it can be applied with success is to nail coarse-mesh wire over the adobe exterior and then plaster the stucco over the wire lath.

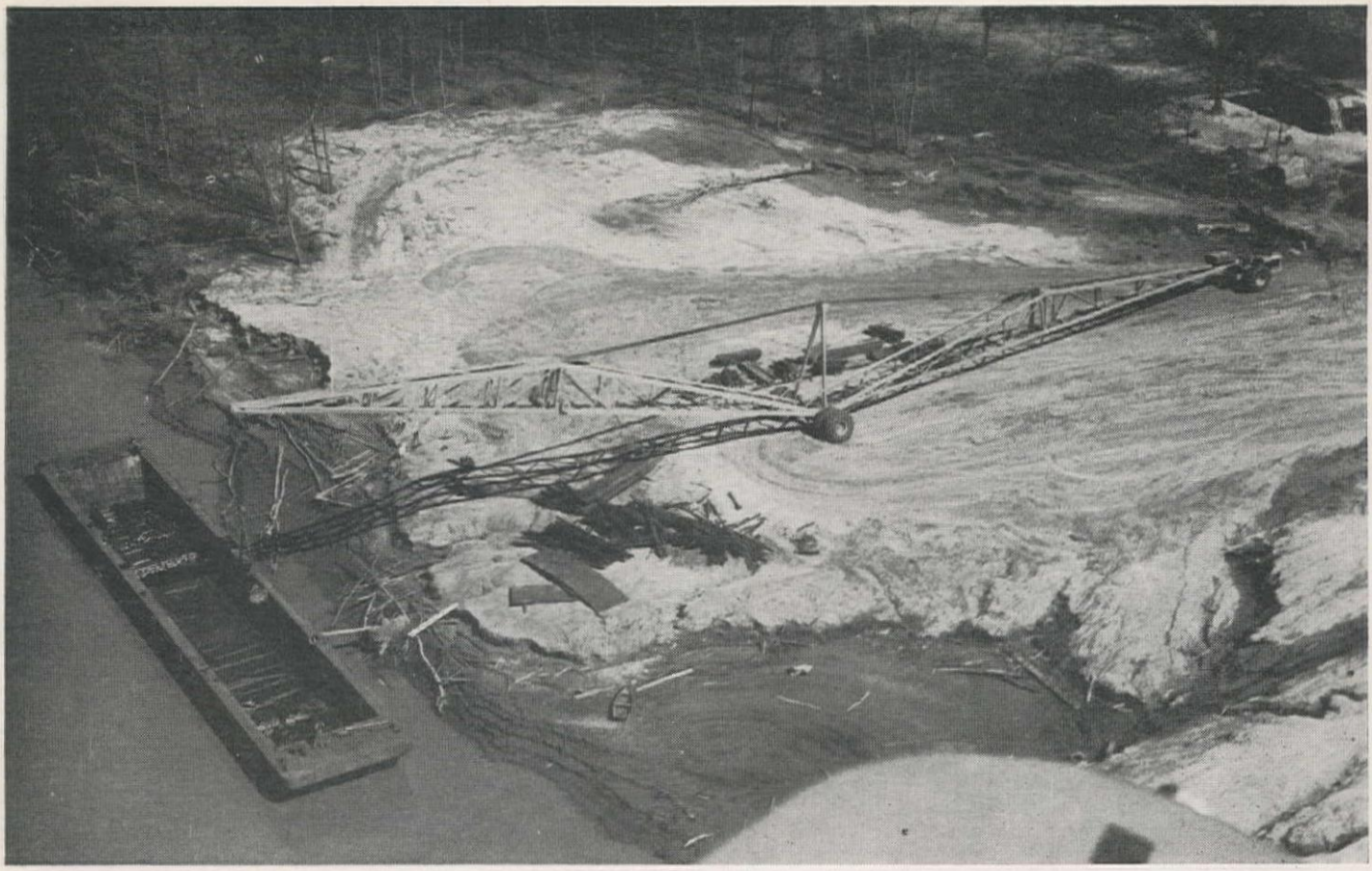
Bureau Recommends Multimillion Dam And Water Works for Santa Barbara

THE BUREAU of Reclamation has recommended construction of the Cachuma Dam and related works to supply irrigation and municipal water to the South Coast area in Santa Barbara County, California, to forestall and relieve critical water shortages. The report has been transmitted to the Secretary of the Army and the State of California for review and comment.

The proposed work, known as the Cachuma Unit, would consist of the 210-ft. high Cachuma Dam, with reservoir capacity of 210,000 ac. ft., on the Santa Ynez River, a transmountain diversion through the 6-mi. Tecolote Tunnel to the South Coast area, the Goleta-South Coast Conduit, and lateral irrigation distribution systems in the South Coast area.

This would support an existing 30,000-ac. agricultural development, where irrigation water at present is pumped from underground sources at rates in excess of the natural rate of replenishment. This area is an important producer of lemons, oranges, walnuts, avocados, vegetables, sugar beets and dairy products. The project also would provide an adequate source of municipal water for the City of Santa Barbara, now using about a third more water than would be available in drought.

Estimated cost for the dam, transmountain diversion, and conduit, is $28,610,000 and for irrigation laterals, $3,700,000. The county already has obtained enabling state legislation which will permit contracts with the United States to carry out the development, including full repayment of the reimbursable costs of the project.



Paul Bunyan in Construction

Pioneer in development of massive earth-moving equipment continues to design king-size machinery for various phases of the construction industry—Newest release from Texas factory include a single-unit house mover, mobile cranes of many sizes, and a new pipe and lumber carrier

SINCE the development of the first big earthmoving units, R. G. LeTourneau, Inc., has pioneered in designing and building even larger units for expeditious handling of materials on a construction job, as well as in other fields of industry.

The LeTourneau plant at Longview, Texas, has been particularly productive of new and large models of construction machinery. The huge house-builder, called the Tournalayer, which holds the forms for a complete concrete house, and the cannon-shaped 7-cu. yd. Tournamixer, which supplies concrete for the pouring of the houses, are built in the Longview plant. Both of the above pieces of equipment have been described in *Western Construction News* (Oct., 1946; April, 1947; and Sept., 1947.)

Three new huge machines recently developed at and announced by the Longview plant are the Tournamover, a large-scale housemoving vehicle; the Tournacrane, a tremendously extended lifting device; and the Tournahauler, a machine for moving pipe, lumber, etc., either on or off the highway. The size and design of these new items is almost fantastic, and seems to unbiased observers to represent something from the Paul Bunyan legend.

The Tournamover

The Tournamover is designed to handle houses up to 25 ft. in width, but has insert sections in the torsional beam which can be easily removed to accommodate narrower structures. By accommodating the machine to the size of the house, the rig is practical for close operations between existing houses. The design of the huge mover permits advance preparations at the new site, even to placing of foundations and basements, since the equipment will completely straddle the foundation area.

The electrically-operated machine is designed simply to pick up a house and carry it away. The laborious practice of raising and lowering a house by jacking and blocking has been dispensed with, and there is no need of the usual rollers and dollies commonly employed. Contractors can use any desired type of understructure or carrying frame. The Tournamover simply moves in, picks up the frame supporting the house, and rapidly moves off with its load to the new area.

SPECIALLY-DEVELOPED Tournacrane with 150-ft. reach and 25-ton capacity for unloading barges where no wharfs exist, or for erecting steel where extremely high lift or big capacity is required (above).

The motive power for the mover is supplied by the Tournapull prime mover used with earth-moving equipment. The smooth, powerful lifting, however, is done by an induction electric motor energized by an alternating current which is supplied from the Tournapull's engine. This motor is mounted on the U-shaped hauling frame and activates three cable hoists that operate simultaneously.

Synchronized with the master hoists are three independent hoists that can lift from each point separately. This special system has been designed to allow independent hoist operation for load leveling, with the master hoist to provide the powerful lift necessary to raise a house quickly and safely off its foundation. As grades are encountered en

route to the new foundation site, this three-point hoist system allows the contractor to keep the house level, thus preventing any of the usual type breakage of household goods resulting from a house being slanted as it rolled up a grade.

Suspension cables from the three hoists are fastened to the Tournamover carrying frame by a specially designed sheave block. Coupling is readily accomplished with the use of only three pins. So, when several carrying frames are employed on a large project, houses are prepared in advance. When the house is ready, the big machine backs in, hoist pins are inserted, and the house is lifted and moved to its new, prepared foundation.

Despite its giant size, the mover is easily steered by small hand-operated electro-switches mounted on the dashboard. This button control determines the direction of rotation of an electric motor located at the rear of the Tournapull. Selective operation of this motor causes the Tournapull to take an oblique position in relation to the hauling frame. This flexibility allows complete freedom of movement, enabling the machine to maneuver in an extremely limited space. Houses can thus be accurately positioned before being lowered onto new foundations.

The Tournacrane

Whenever there is a lifting job on a construction project, the new electrically powered Tournacrane provides an effective answer. No outrigging or end jacks are needed; it's literally, pick up and go.

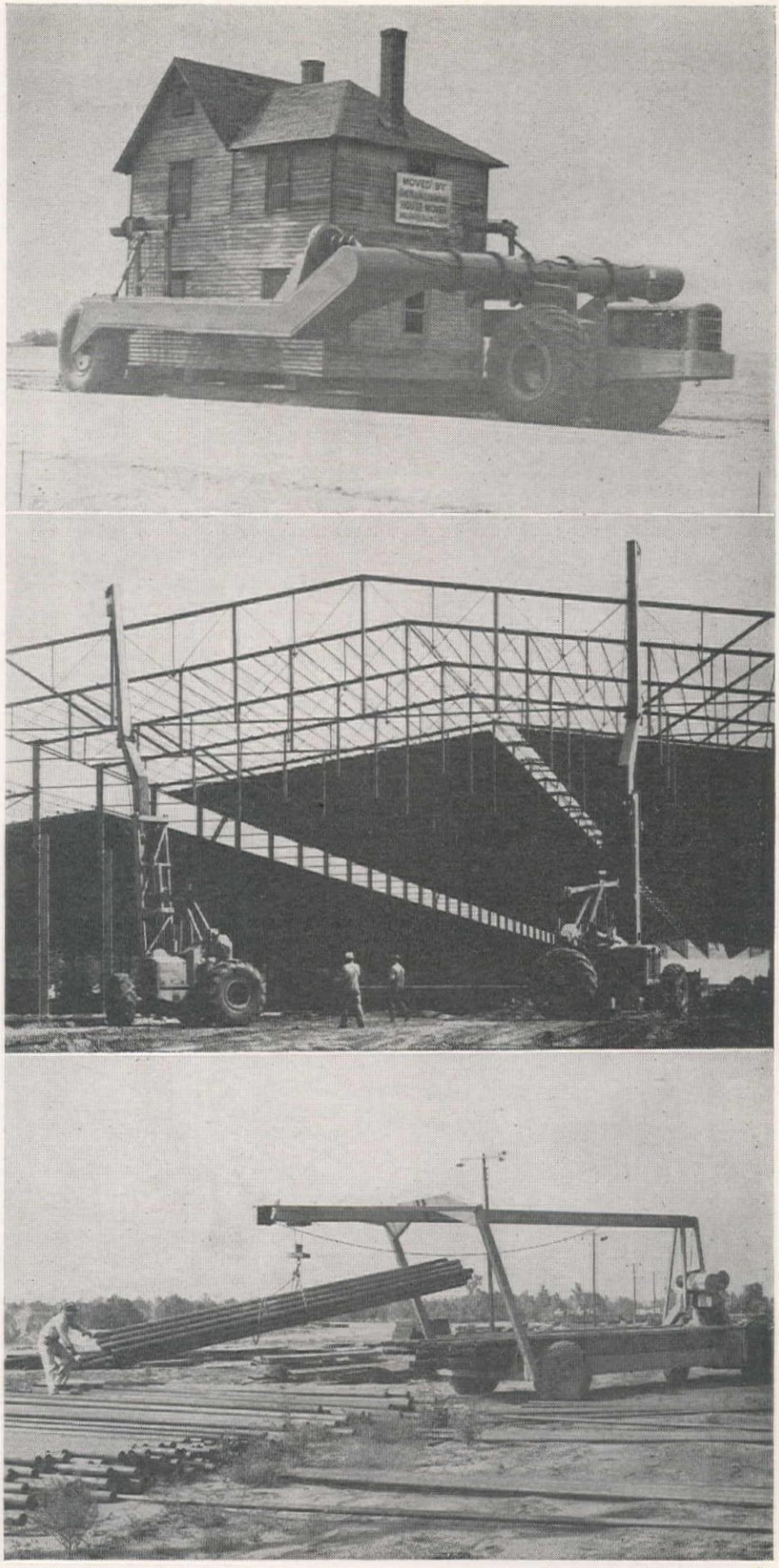
The Tournacranes are Diesel-powered on four large pneumatic tires, and if there are obstacles in the way, such as railroad tracks or curbs, there is no necessity for the operator to lay any ramps or look for another way around. The big-tired crane simply rolls over them.

The Tournacrane is a one-man operated machine. The operator, from his seat on the Tournapull, may with a flip of his finger, control all operations by push buttons located on the instrument panel. No additional men or machines are even needed to transport the apparatus from one project to another. It may be simply driven there, all set up ready to perform whatever task might be the assignment.

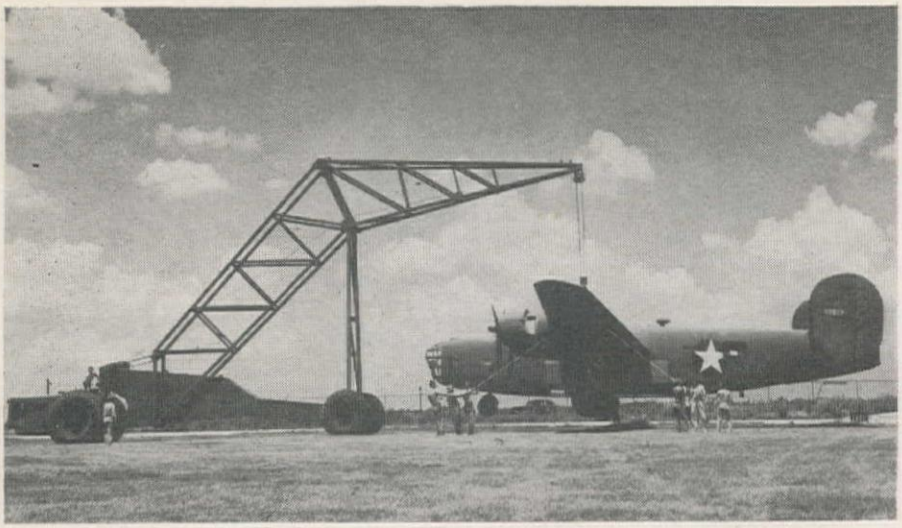
One case, cited by LeTourneau, of one prominent contractor, operating on the Canol project, used a Tournacrane to load equipment onto trucks about 15 to 20 miles from camp. He was able to get back to camp with his crane nearly as fast as his trucks and by unloading them too, he was thus saving the cost of operating two cranes, one at each end.

Mainly responsible for the smooth, powerful lifting of this new crane, are three electric motors fed by a high-capacity generator mounted in line with the engine. One motor raises and lowers the pulley block, one raises and lowers the boom and another determines the angle of the boom track.

The cranes are manufactured in sev-



THE THREE latest giants to be turned out of the Longview, Tex., factory of R. G. LeTourneau, Inc., are the Tournamover, shown at the top moving a complete house; the Tournacrane, shown in center erecting pre-fabricated roof trusses for an industrial building; and the Tournahauler, shown at the bottom, loading pipe. All three are moved by tractor already familiar to construction men as the Tournapull power unit. These machines are fitting companions to the house builder, the Tournalayer.

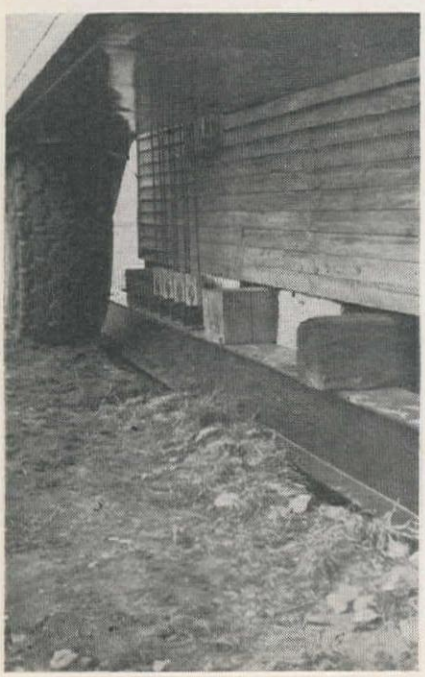


ONE ADAPTATION of the Tournacrane was developed during the war as an emergency unit at Army air bases. Whenever a crash or mechanical difficulties of any kind caused a plane to stall on runways or other important areas, the crane was able to lift the whole plane (a B-17 bomber in the photo) and speed it back to repair points.

eral different sizes. One, sort of a standard, has a lifting capacity of 15 tons, with a maximum possible lift of 30 ft. and a reach of 26 ft. This, however, can be increased to over 42 ft. by the addition of a boom extension. Most amazing of all, the crane can travel, fully loaded, either on or off the pavement at speeds of better than 20 m.p.h., and because of the wide rubber tires that support it and give a big bearing surface, can move safely across mud, sand, or rough terrain.

Only recently a special adaptation of one of the LeTourneau cranes was developed to load and unload river barges where suitable piers did not exist. This crane had a lift and reach of 150 ft. and had a capacity of 25 tons.

STEEL CARRYING frame upon which the house rests for moving in the Tournamover. Transverse beams through holes in the foundation, will lift house off concrete when cables raise frame.



The Tournahauler

This revolutionary rig, also mounted on large rubber tires, has the power and traction to negotiate almost any type of rough going, and, with loaded capacities ranging from 20 to 100 tons.

The Tournahauler is engineered for both long and short hauls. The machine's construction will permit its traveling into areas inaccessible to conventional-type trucks and trailers. The hauler demonstrates its amazing versatility particularly under adverse conditions of off-road operations. Equipped with a new type Tournamatic differential, greater traction is obtained by causing the drive wheel having the greatest traction to pull several times harder than the other. In other words, the most power is supplied to whichever wheel is on the firmest footing.

A 50-kva., in-line operator, driven off the engine, supplies current to an electric motor, operating a gear on the yoke king pin, which steers the prime mover and trailer as a locked integral unit. Thus positive control is attained at all times. Unusual design permitting 90-degree turns provides fast and easy maneuverability.

For certain types of operation, overhead trolleys, winches or jib cranes with electrically-powered cable hoists may be installed, also powered from the same generator which operates the steering mechanism. The addition of either the crane or trolley adds the supplemental features of self-loading and unloading.

Adaptable to the transportation of any type of load, hauling 28 tons of sugar cane 4.9 mi. in 15 minutes was the impressive record established by the Tournahauler during performance tests at Ewa Plantation Co. on Oahu, Hawaii. A conventional heavy-duty truck carried 10.5 tons of cane over the same route in 12 minutes.

No, Paul Bunyan isn't dead. He's merely moved the seat of his operations from the Minnesota woods to Longview, Texas!

Federal Works Agency Report for 1947 Is Issued by General Fleming

THE EIGHTH Annual Report of the Federal Works Agency, the civil construction arm of the Government, has been released by Major General Philip B. Fleming, Federal Works Administrator. It covers the work of its constituent Public Buildings Administration, Public Roads Administration, and the Bureau of Community Facilities for fiscal year 1947.

The Report notes that during the fiscal period much public construction was voluntarily deferred, that construction costs continued to climb and that some materials were in short supply.

"FWA recognized, however, that public works essential to the health, safety and welfare of the country must either go ahead, or must be completely planned and blueprinted for construction as soon as conditions permit. So in fiscal year 1947 the Federal Works Agency renewed its emphasis on advance planning and in several significant research studies and experiments relating to the public construction economy, to traffic problems, and building management and operation."

Other activities of the Agency, undertaken at the direction of the President, included conferences of national scope on fire prevention and highway safety, and in disaster relief utilizing surplus war property.

The Public Buildings Administration, as a result of data previously submitted to Congress and continued study of new projects and revisions reported a list of 4,183 eligible Federal building projects under a total limit of cost of $1,059,661,000. Twelve additional projects to cost an estimated $161,795,000 have been developed for future construction within the District of Columbia.

Public Roads reported completion of 7,929 mi. of highway of all classes of Federal-aid construction as compared with 2,964 mi. in 1946 and 12,936 mi. in 1941; wound up the work of designating the routes to comprise the National System of Interstate Highways, a cooperative task between the States and the Federal Government, and announced listing of 350,809 mi. designated for the Federal-aid Secondary Highway System as compared with 217,073 in fiscal 1946.

The Advance Planning Program of the Bureau of Community Facilities expired on June 30 with the War Mobilization and Reconversion Act of 1944, but on that date the Bureau had approved 7,338 applications for repayable planning advances in a total amount of $61,669,000 for State and local public works to cost an estimated $2,300,000,000. There remained under review 2,309 applications.

Rapid Ice-Making Machine Developed To Furnish Ice for Cooling Concrete

Concrete mixed with crushed ice in the aggregates for Davis and Fort Gibson Dams, thus reducing internal temperatures after pouring — Ice manufactured in convenient size by rapid-freezing, automatic machine requiring little space

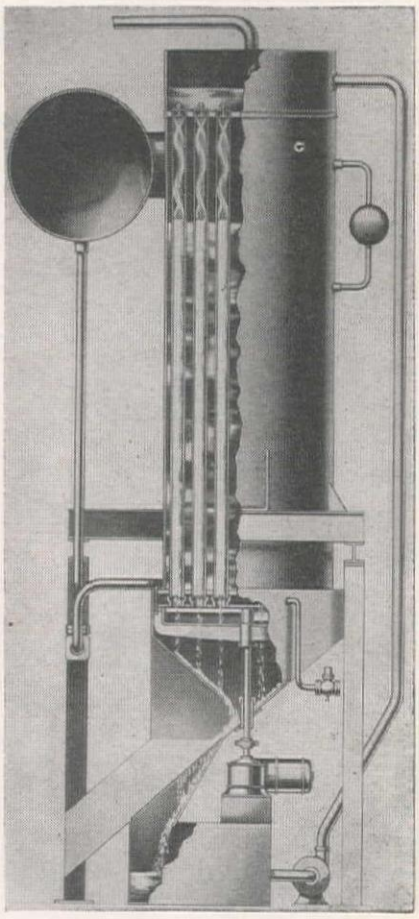
IN THE CONSTRUCTION of dams and similar projects involving large masses of concrete, the use of ice and cold water to lower and control the temperature of the components of the mix is of comparatively recent origin. The removal of excess heat by the ice before the concrete is introduced in the structure reduces the rate of heat generation caused by the chemical reactions of setting in the early stages and facilitates control of the temperature rise. By this means, internal temperatures are kept within safe limits during the critical curing period and the maximum durability and safety of the structure are assured.

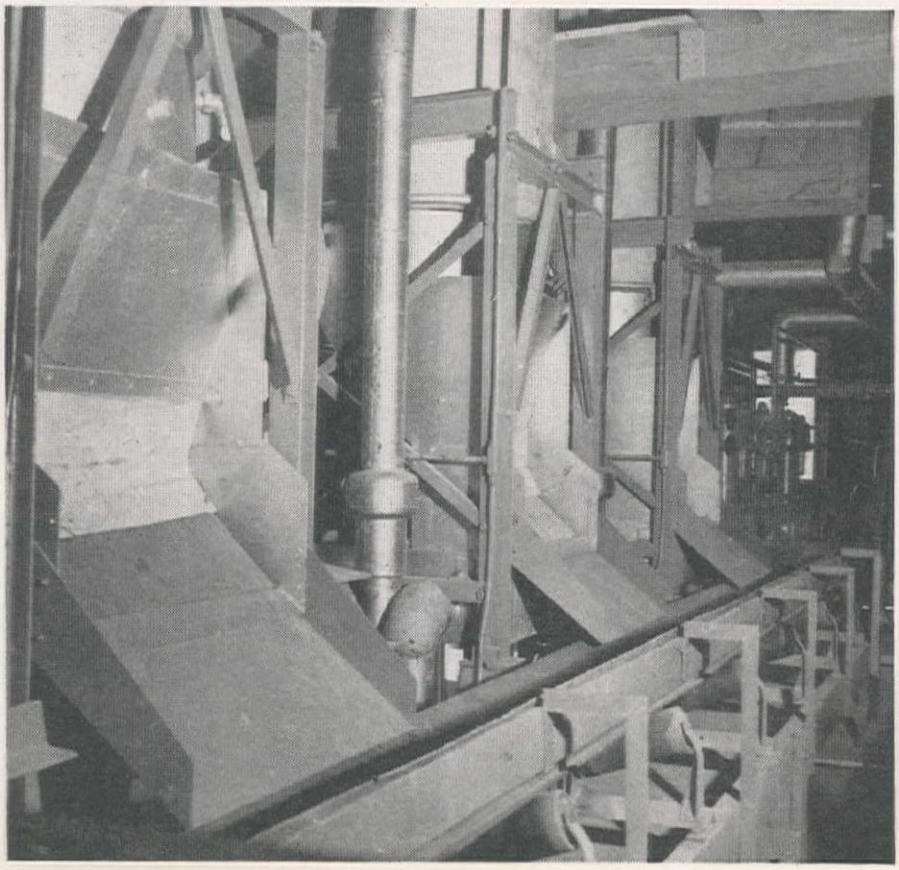
Unique ice making machines of recent development are providing ice and cold water for two Western dams now under construction, namely Davis Dam on the Colorado River, 98 miles south of Boulder City, Nev., and Fort Gibson Dam, 12 mi. northeast of Muskogee, Okla. The ice making units are known as Vogt Automatic Tube-Ice Machines and the ice produced is called Vogtice.

New ice-making practice

The tube-ice machine represents a radical departure from previous ice manufacturing methods by producing sized ice at once in its ultimate form with a minimum of equipment and building space. Instead of freezing large blocks of ice (300 to 400 lb.) in cans or molds with the necessary brine tanks and other equipment for such systems, the tube-ice machine freezes ice in tubes of small diameter with direct application of the refrigerant to the freezing surfaces. This freezing is accomplished quickly and economically through the elimination of brine tanks, brine circulators, ice cans, can fillers, dip tanks, dumpers, cranes, cubers and crushers, and the power, labor and maintenance for such "can ice" equipment.

In making ice the water is pumped from a tank at the bottom of the freezing unit to a distributing box at the top. Here it gravitates downward through distributors which cause the water to be projected against the inner surfaces of the tubes over which it passes in its descent. The refrigerant is admitted into the shell and surrounds the tubes, thereby causing ice to form on the inner surface of the tubes. Water which is not frozen returns to the pumping tank, from which it is again circulated. This action is continued until ice of the desired thickness is formed as determined by the length of the freezing period which in turn is adjusted and automatically controlled. Crushed ice is produced from thin shells. Thicker shells, not crushed, are designated as cylinder ice.

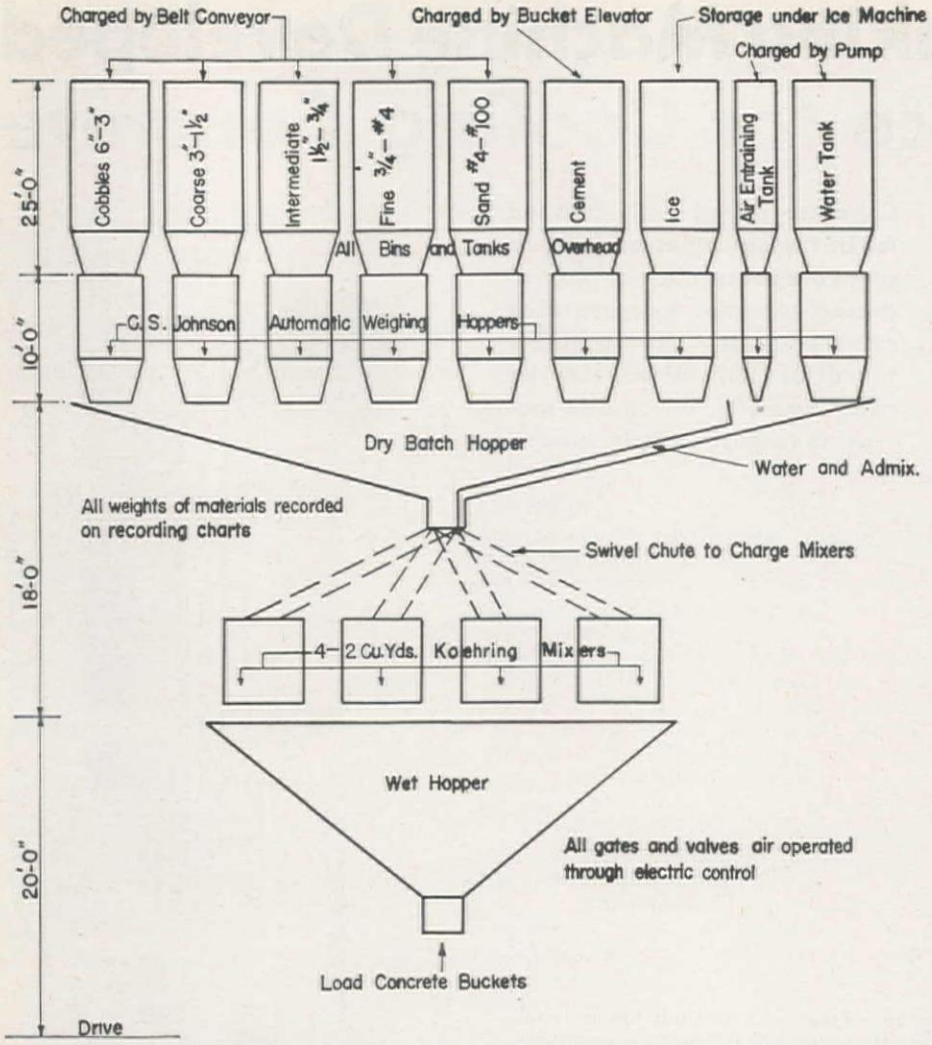




DISCHARGE CHUTES of three tube-ice machines employed by Utah Construction Co. at batching plant at Davis Dam, with rubber conveyor belt to carry ice to mixers, below. At right, is a diagrammatic sketch of the Vogt automatic ice machine, showing the freezing cycle. Capacity of the plant at Davis Dam is 60 tons of crushed ice daily.

Ice discharged

The freezing period is started and stopped automatically and high pressure gas from the condenser then displaces the refrigerant in the shell. This action, together with the introduction of water to a thawing chamber beneath the freezing chamber, causes a slight melting of the ice which is thereby freed from the tube walls and descends to a motor-driven rotary cutter placed beneath the freezing unit, which cuts or crushes the ice cylinders to the desired size. By a



SCHEMATIC LAYOUT of batcher plant of Johnson-Winston-Kiewit Co. at Fort Gibson Dam, showing ice machine and air entraining supply automatically operated.

simple and rapid adjustment of the cutter either crushed or cylinder ice can be made without stopping the machine.

The cut or crushed ice is discharged from an inclined metal chute, a slotted section of which provides for the return of the meltage to the pumping tank for recirculation.

After the ice has been discharged, the refrigerant is again admitted to the shell and the water pump resumes circulation of the cold water which descends through the tubes to be frozen as before. Makeup water is automatically admitted to the water tank to replace that which is frozen in the tubes.

In addition to making sized ice, the tube-ice machine supplies cold water as required. This is accomplished by merely raising the refrigerant evaporating pressure above that required for making ice.

Application at dams

At Davis Dam, Utah Construction Co., the contractor under the Bureau of Reclamation, employs three tube-ice machine units each with a 34-in. diameter freezer in the production of approximately 60 tons of crushed ice per day and these are installed in a building adjacent to the concrete batch plant. A rubber belt conveyor delivers the ice to a bucket elevator which raises it to a height of 112 ft. Here it is discharged into a helicoid conveyor which controls the rate of supplying the ice to the mixers.

Three tube-ice machine units, each with a 48-in. diameter freezer and having a total of 180 tons ice capacity per day, are employed at Fort Gibson Dam, an Army Engineer project. The tube-ice machines in this case are installed in a 26-ft. square space on a platform above and to the right of the 73-ft. high mixer building where is prepared the concrete mix on the project.

All the component parts of the concrete are brought to the central mixer building shown on the schematic layout herewith. The proper proportions and weight of dry aggregate, cold water, and sized ice which enter into each batch are under strict control at all times in order that its temperature, when leaving the mixer for placement in the structure, will be within predetermined temperature limits.

Experience has shown that the best results are obtained when the concrete leaves the mixer at about 75 deg. F. and is placed in the structure at a temperature not exceeding 80 deg. F. The contractors, Johnson-Winston-Kiewit Co., pour about 150 cu. yd. of concrete per hour for 16 hours each day. This requires 135 tons of crushed ice together with cold water as cooled by 45 additional tons of ice.

Important savings of plant and building space are realized with the tube-ice machine, which requires but one-tenth the space occupied by a can-ice tank of equal capacity. A good example of this is the 180-ton capacity units at Fort Gibson Dam which occupy a space approximately 26 ft. square. A can-ice plant of equal capacity would have required a building approximately 34 ft. wide by 116 ft. long with additional space for ice crushing equipment. Compressors, condensers, etc., would be the same for either system.

Because of their compactness and ease of dismantling, the tube-ice machines can be completely salvaged after they have served through the construction periods and can be re-erected at other locations for further use.

New Source of Perlite Developed in Colorado

A PERLITE MINE containing several million tons of high grade ore has been opened in southern Colorado by the Alexite Engineering Division of Alexander Film Co., Colorado Springs, Colo. Perlite is the newly discovered mineral of volcanic origin, containing entrapped water and 75 per cent silica. Manufacturing processes perfected by the company crush, size and expand the ore at controlled temperatures with the end product being a series of lightweight, pure white aggregates containing millions of air cells under partial vacuum.

Weight of the expanded aggregate is about one-tenth as much as sand and gravel. The company proposes use of large sizes of the substance to replace sand and gravel in blocks and masonry where strength and insulation are both requirements. The smaller sizes are comparatively lighter in weight, are suggested for use in insulating and fireproofing roof decks, sound-deadening and fire-proofing plasters and for cutting down the dead load through use in plaster and concrete mixes.

State Highway to Remain in Present Location at Redlands

STATE ENGINEERS have changed their minds about relocating Highway 99 west of Redlands, California. The plan had been to bypass Redlands with a road from Colton to Beaumont through San Timoteo Canyon south of Redlands. But traffic surveys showed that Highway 99 carries more Redlands traffic than through traffic so it was concluded that the highway would give fullest amount of service on its present location. The highway department is now going ahead with a $1,400,000 project to make the highway a four-lane, divided-center road from State St. to South E St., the turnoff to San Bernardino east of Colton.

Portrait of a State Engineer

Ed Watson, colorful State Engineer of Utah, is devoting all his endeavor to securing water from the Colorado River for the Central Utah irrigation project —High cost of the diversion could logically be borne by electricity generated on the project itself, he insists—Watson combines liberal crusading spirit with realism

By O. N. MALMQUIST
Salt Lake City, Utah

THE PROFESSIONAL career of Ed Watson, state engineer of Utah, can be roughly divided into two phases —trying to avoid the menace of water in the Colorado river basin and trying to get as much of that precious resource for his state as possible.

As a geologist for the Utah Oil Refining Company for 13 years, he regarded water as his No. 1 enemy. But as state engineer since 1941, and as the Utah member of the Upper Basin States Compact Commission, his most important assignment is to protect the state's interest in the Colorado river, which has been aptly described as the arid southwest's last waterhole.

Between the two phases of his professional career, Ed took a brief fling at politics, a field of activity that had made no impact on his consciousness prior to the early thirties. But when the twin stimulants of depression and Franklin D. Roosevelt did arouse his interest in the relationship between economics and government he plunged into politics with characteristic vigor. An extreme partisan by disposition, he became an ardent champion of the New Deal philosophy. And as a member of the state House of Representatives in 1937 and of the State Senate in 1941, his views were often irritating to his more conservative associates — both professional and political. But because he is always stimulating, even when he is irritating, he has a way of getting along with those who violently disagree with his political and economic views.

A realistic crusader

Mr. Watson's deep and sincere admiration for the late President Roosevelt naturally directed his sympathetic attention to some of the New Deal experiments—notably the Tennessee Valley Authority. And he emerged from his studies of that government enterprise a staunch supporter of the valley authority technique of developing river systems. He personally believes that creation of a Colorado river basin authority would provide the easiest and most satisfactory answer to the complex problem of allocating and putting to use the waters of that river system. A statement of his views on this subject appeared in *Western Construction News* for December, 1945.

But Mr. Watson, despite his natural crusading fervor, has a strong streak of realism in his makeup. He has the ability —and this is one of the most surprising aspects of his character—to subordinate Ed Watson, the individual, to Ed Watson, the Utah State Engineer. And Ed Watson, State Engineer, realizes, and cheerfully concedes, that the TVA idea is not feasible for the Colorado River.

"Arizona," he explains, "already has a public power authority and does not want a Colorado Basin authority. The representatives of Wyoming and Colorado are against it. And many water users in Utah do not want it. Why should I try to ram my personal views down the throats of the majority who disagree with me?"

The fact that Watson isn't pressing for an authority does not mean that he is compromising his personal convictions, or that he shies away from a fight. On the contrary he will defend the valley authority philosophy at every opportunity. And he rather enjoys a good fight. But in this instance he simply feels that his job as State Engineer is to work for the development of the Colorado River in the pattern desired by the water users and to get as much out of the scramble as he can for Utah.

Dividing a river

Being a realist, Watson is not at all optimistic over the prospects of the states reaching an agreement on allocation of the waters of the river system. As Utah's member of the Upper Basin Compact Commission he will do his best to bring that result about. But the disagreements are so diverse, so deep-seated and so far-reaching that he expects pressures, as well as good-will, will ultimately be required to produce a solution.

EDWARD H. WATSON, State Engineer of Utah since 1941, a water crusader.

His own opinion is that the over-all issue will have to be settled piece-meal. For example, each of the states might go out after an initial major project, predicated on the 1,000,000 plus acre feet of unappropriated water annually available to the upper basin without stream regulation. Thereafter, as dams on the main stem and major tributaries equate the flow and increase the amount of available water, the pressures of nature, the law and politics will work toward a complete division, equitable or otherwise.

Central Utah project

Watson's conviction that the states should seek projects now, instead of waiting until an upper basin compact is agreed upon, is no doubt fathered in part by his intense desire to see a start made on the proposed Central Utah project. He is an all-out advocate of this project, on which a preliminary report has been made by the Bureau of Reclamation. It involves the transmountain diversion of some 600,000 ac. ft. of water from Uintah basin tributaries of the Colorado river system to the Wasatch front and central valleys of the state. The collection would be made at an elevation of between 7,500 and 8,000 ft., the water diverted through some 90 mi. of tunnels (none more than ten miles in length) to a greatly enlarged Strawberry reservoir, and released down Spanish Fork canyon, which would provide a power drop of almost 3,000 ft. and about 400,000 kw. of installed electric generating capacity.

To some Utahns the scheme seems a bit on the fantastic side, as the cost would be more than $400,000,000. But Watson, a near-fanatic on public power, thinks it could be soundly financed from the sale of electrical energy. As a preliminary step toward "selling" the state on this idea he, with others, promoted state legislation providing for a power market survey by the Federal Power Commission. The report, which necessarily deals mostly in assumptions rather than established facts, supports the Watson thesis if one is willing to accept the assumptions as to future development.

A favorite pastime of Watson is arguing with the enemies of public power.

"If there was any one factor responsible for victory in the last war," he declaims, "it was public power. Without it expansion of the aluminum industry and our achievements in plane production would have been impossible. And it was public power that enabled us to produce the atom bomb."

A native Westerner

Watson was born in the small town of Bellevue, Ida. October 11, 1884, but has been a resident of Utah since childhood. His father was a mining engineer and this served to stimulate Watson's interest in geology and engineering. He was educated at the Utah State Agricultural College and University of Utah,

receiving his geology degree from the latter institution. He is married and has three sons—one in aeronautical research, one an engineer and one studying business. His hobby is his physical environment. In fact the mountains, deserts, and streams, and the flora and fauna of the Colorado river basin are almost his religion. Like the postman who goes for a walk on holidays, Watson spends his spare time roaming the countryside to appreciate as well as to study his physical surroundings.

He is a lusty, exuberant type of fellow both physically and mentally. And whether he is shaking hands or expressing an idea, his reactions are positive and emphatic.

Slip Forms Speed Concrete Placement on Tacoma Mill

Entire 110-ft. structure poured monolithically through use of moving forms, raised about 4 ft. in each 8-hr. shift, and floors are also part of monolith, as walls are temporarily halted to permit concrete to be poured in slab—160 jacks used in simultaneous lifting operation for forms on main building of the mill

By A. R. MacPHERSON
Tacoma, Wash.

CONTRACTORS IN the Tacoma, Wash. area are following with great interest the rapid progress of construction on the building of the new $1,500,000 plant for the Washington Cooperative Farmer's Association. To speed erection of the huge concrete project, contractors are employing the building method known as slip form construction, which was also used on the Port grain elevators built in Tacoma in 1946.

Plans for the project call for the construction of an eleven-story, reinforced concrete feed mill, a 4-story concrete warehouse, and ten 110-ft. high concrete tanks, or bins, erected on the northeast end of the building, the bins having a storage capacity of 276,000 bushels of grain. In addition, will be 2 car unloading pits, one with a track scale, a structural steel track shed and equipment, and an underground concrete molasses tank of 12,000-gal. capacity. On the adjoining Hylebos Waterway opening into Puget Sound a concrete ship loading dock will be constructed, equipped with an underground elevator for conveying grain.

The entire project is being constructed on 7 ac. of property located in the Tacoma tideflats industrial area adjoining Hylebos Waterway. Work commenced in June, 1947, and is expected to be completed by April 1, 1948, including installation of all interior machinery and equipment. Floor area of the mill and warehouse, exclusive of storage bins, is 85 by 104 ft.

Under the slip form construction method, the elevator and feed mill rose at the rate of 11 to 12 ft. a day, exclusive of time consumed in pouring the concrete floors, and operating on a 24-hours per day schedule. By means of a system of 160 jacks, forms for the walls of the buildings and elevator are all raised simultaneously. A special team of men control and operate the jacks while the walls are being poured. Every few minutes at a signal from the foreman, the jacks are turned a given number of times, elevating the forms a fraction of an inch, for a total of 3 to 4 ft. for each 8-hr. shift, thus giving a monolithic pour. The upward climb of the buildings is halted at each succeeding story as the workmen stop to pour the concrete floors.

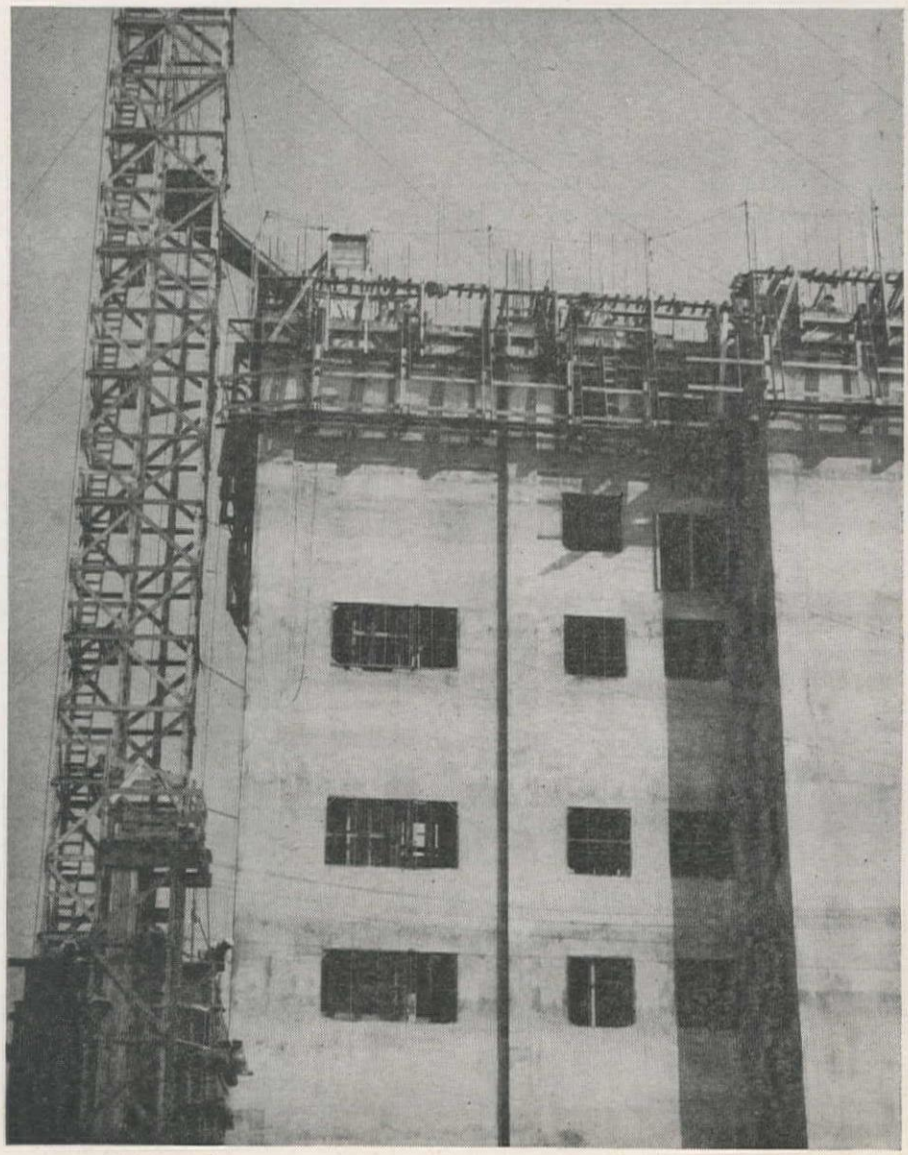
The 10 concrete tanks will be poured in 8 or 9 days each, also using slip forms.

All forms used on the buildings were constructed on the job, including a finishing scaffolding fastened to the slip forms, so that they are raised with the form. Workmen on the scaffold, finish the wall exteriors as the forms move up. All concrete for the project is mixed on the site, with the cement arriving on a railroad siding in boxcars, while gravel is brought in by trucks. It is estimated that 14,000 bbl. of cement, sufficient to make 11,000 cu. yd. of concrete, will be used on the project.

The Jones-Hettelsater Construction Co. of Kansas City, specialists in building grain elevators and feed mills, are contractors on the building of the plant. Six staff men were sent to Tacoma, headed by Joe Ryerson, a veteran of 20 years' experience with the company, as superintendent of the job, and Sam McQueen, who has been with the company for 10 years, acting as office manager.

According to Paul D. Shaffer, local manager of Washington Co-op, the new plant will have three times the capacity of the present plant in Tacoma.

POURING TOWER and slip forms in use on the main building of the Tacoma feed and grain mill. Scaffolding suspended below the forms is raised with them, and is for the use of the concrete finishers. Elevators and bins are being built with slip forms.



Arc Welding Repairs Turbine

Pitting in the buckets of the Montana Power Company's water turbines at Great Falls was lowering efficiency—Units were repaired to original strength with the welded area being almost identical in color and texture with parent metal

By ROBERT B. MARTIN
Montana Power Co., Great Falls, Mont.

LARGE HOLES in the bucket and weakened areas in vane and shroud of the turbines were caused by cavitation effect in the hydraulic stream. Before and after views, above and below, show how original shape and thickness were restored. The 15,000-h.p. Francis type turbines were repaired at one-fifth estimated cost of new runners.

THE MONTANA Power Co. depends entirely upon water turbines to generate electricity for some 100,000 customers, practically the entire population of the nation's third largest state. The matter of turbine maintenance, therefore, becomes one of very great importance.

Of the thirteen hydroelectric plants that comprise the total generating facilities of the company, four are located on the Missouri River within a radius of eighteen miles of the city of Great Falls. The largest of these, and incidentally the largest in the state, is the Ryan development located at the Great Falls of the Missouri, about 15 mi. from the city.

The Ryan plant was put in service in 1915 and consists of six identical units, with a total rated output of 90,000 hp. These generators develop 3-phase energy at 6,600 volts, which is transformed through a step-up transformer bank to 105,000 volts for transmission to the electrolitic zinc refinery at Great Falls, the mines at Butte, and the Chicago, Milwaukee, St. Paul & Pacific Ry., for use in its electric locomotives. These generators are each powered by a 15,000-hp. Francis type vertical turbine, manufactured by the S. Morgan Smith Co. of York, Pa.

The plant was put in operation in 1915 coincidental with the electrification of the above mentioned railroad. This fact is mentioned to give emphasis to the importance of the plant, the type of load it serves, and the need for a carefully planned and efficient maintenance program.

History of repairs

Within five years from the time these turbines were first put into service it became necessary to undertake some type of periodic repair to the bronze runner buckets and blades. Cavitation effect in the hydraulic stream through the wheel caused rapid and progressive pitting. This pitting eventually resulted in large holes in the buckets and thin or weakened areas in the vanes and shroud.

Since 1920 yearly attempts have been made to repair and strengthen these runners by use of both acetylene and electric arc welding, but since this work was all overhead the results were not particularly good. The vanes and buckets eventually became so thin and porous that the turbine efficiency was noticeably lowered and the strength of the remaining metal was very questionable.

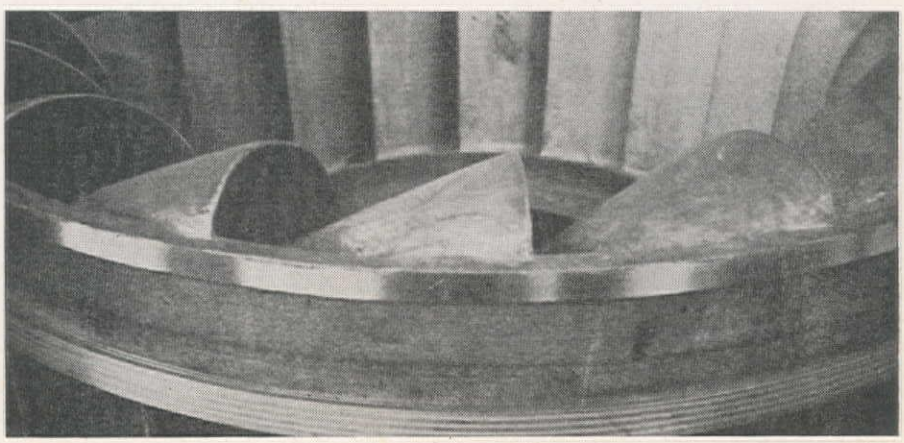
Only recently it was decided that these units should be completely dismantled one at a time and the runners repaired by arc welding. The cost of new bronze runners for the units would be approximately $6,000 each and there was considerable doubt whether it would be possible to purchase them at all at the present time. The runners weigh four tons each and the current price of bronze casting is 55 cents per lb. Furthermore it was considered unlikely that the S. Morgan Smith Co. still retained the patterns used for the original casting. It therefore appeared that the repair of the old runner by arc welding was the only practical step to be taken.

The first of these units was taken out of service on March 18, 1947 and the dismantling procedure started. After two weeks work the turbine runner was removed from the shaft and ready for repair. All repair work was done under an electric hoist so that the runner could be tipped or supported at any angle most convenient for ease of welding.

Chipping and grinding

All sponge metal was first chipped or ground out of pitted areas. Areas that were supported by metal of sufficient thickness and strength were cleaned by use of a chipping hammer, using both flat and gouge chisels. On the outside of the buckets where the metal was quite thin, equivalent results were obtained by grinding, using a rotary vane air grinder and many different shapes and sizes of grinding stones. After considerable experimentation two types of stones were found to be more satisfactory than the others. The first was a 4 x 4 x ⅝-in. cup shaped stone with a 1½-in. deep countersink at the arbor hole to hide the nut on the grinder arbor; it was possible to use this stone in almost any position. The other stone was also a special order, being a mandrel type, 2 x 3 in. This latter stone is used with the same air tool by being attached to the end of the grinder arbor with a steel sleeve having a female thread on each end.

After trial it was found that a stone



of grit 20 was about right for the castings involved in the operation. An analysis of the metal showed it to be 88 per cent copper, 10 per cent tin and 2 per cent zinc.

Heating and welding

A considerable amount of preheating was used on this casting as the welding was being done, in order to prevent cracking and checking. Eighteen electric space heaters, each rated 500 watts at 220 volts, were clamped one to each vane at the inside edge. These heaters provided general over-all heat and kept the entire casting at a temperature of about 100 deg. F. Additional heat from a blow torch provided high local heat in the area to be welded, and this precaution was taken each time before the arc was applied.

Lincoln Aerisweld welding rod in two different sizes was used to make the repair. Electrode of 5/32-in. diameter was used to fill the deep areas and ⅛-in. electrode was employed when a low bead was necessary. Current was used at reversed polarity. All welding was done in the down hand or horizontal position. The buckets were welded both inside and outside and ground until their original shape and thickness had been restored. The large cavities and cracks that existed in the shroud between bucket tips were likewise filled and ground until all surfaces assumed their original pattern. The wheel was thus restored to its original strength by what was clearly the most practical method, namely, arc welding.

One very significant fact was that after the repair was made, the color of the welded area was almost identical to that of the parent metal. An exceptionally well restored contour and smooth surfaces were obtained by a continual troweling movement of the grinder. If the grinder is allowed to rest long in any one position flat spots will result.

On May 9, after 28 man-days each for the writer and his helper the repair was completed and the wheel was ready for machining and balancing.

Replacing the wheel

New steel bands were rolled, machined on the inside, and shrunk in place on both the top and bottom rims of the runner. It was then put on a boring mill and steel bands machined to proper width and diameter, after which four rectangular labyrinths, ⅛-in. deep and 3/16-in. wide were cut in each band. These were to match with labyrinths of similar size and spacing in both stationary rings of the turbine.

The first job of balancing was done by mounting the runner in a horizontal position on parallel edges. The wheel was mounted on a hub which was slid over a piece of 6¾-in. steel shafting. The shaft and wheel was then rolled on the parallel edges to determine the heavy side. These parallel edges consisted of two short pieces of 90-lb. railroad rail which had been planed on the top and placed on timber cribbing at a height that permitted the wheel to roll freely. Five pounds of counterweight was used to balance the hub, after which 28 lb. of lead was applied to balance the wheel. The original counterweight had disintegrated.

This completed runner has now been remounted on the turbine shaft and was put in service on June 16 after wicket gates and other turbine parts had also been completely repaired. Similar repair is now progressing on the other units of the generating plant.

Data and illustrations in this article are from a study submitted to The James F. Lincoln Arc Welding Foundation in its recent $200,000 Design-For-Progress Award Program for reports and advances and improvements made by the applications of arc welding in design, fabrication, construction and maintenance.

Cost data

The total cost of dismounting, repairing, and replacing the wheel was $1,240, as compared with the anticipated cost of $6,000 plus freight and handling, which would have been required for a new wheel. Broken down the cost was:

Labor	
28 days, welder, @ $13.20	$ 369.60
28 days, helper, @ $11.40	319.20
Material	
30 lb. ⅛" rod @ $1.24	37.20
70 lb. 5/32" rod @ $1.16	81.20
Total cost of welding and grinding	$ 807.20
Other Expense	
Cost of all machine work	326.21
Cost of balancing	59.36
Drayage	48.00
Grand Total	$1,240.77

Engineers and Bureau Both Present Plans for Harnessing Snake River

TWO SEPARATE plans for development of the middle Snake River were presented to the Columbia Basin Interagency Committee at the December meeting of the group held in Baker, Ore. Both the Corps of Engineers and the Bureau of Reclamation briefed preliminary proposals for the construction of a high power and storage dam to be built in the Grand Canyon of the Snake River about midway between Weiser and Lewiston, Idaho. A third, but considerably smaller power dam had previously been proposed for the same general location by the Idaho Power Co., but the plan was postponed.

The Hell's Canyon dam proposed by the Portland district of the Corps of Engineers would be about 700 ft. high to form a reservoir 89 mi. long and raise the water level at the dam site 575 ft. The installed hydroelectric power capacity would be 1,190,000 kw. Further development of the middle Snake would be accomplished by construction of a second dam downstream from Hell's Canyon for which the Corps of Engineers suggested two alternate sites.

Nez Perce, just downstream from the mouth of the Salmon River, would be the preferred site, provided that fishery problems can be solved prior to development of the river at that point. A 610-ft. dam would form a 64-mi. pool, and installed power capacity would be 1,700,000 kw. The alternate site, Mountain Sheep, is ½ mi. upstream from the mouth of the Salmon where a 600-ft. dam would develop 1,150,000 kw. of power. Construction of two dams is estimated to cost $592,000,000 based on 1947 construction costs.

The Hell's Canyon dam proposed by the Bureau of Reclamation would be 742 ft. high to form a reservoir about 100 mi. long. The dam would be of arch-gravity design with a crest 1,740 ft. long, and very similar in appearance to Hoover dam on the Colorado River. With an installed generating capacity of 900,000 kw., the estimated construction cost of the project is set at $313,000,000.

Construction of a dam under either of the two proposals would flood the site upstream at which the Idaho Power Co. last year planned to construct a dam for the generation of power to supply eastern Oregon and western Idaho. Construction plans were postponed by the company after preliminary studies had been completed.

The Corps of Engineers presented its plans as a part of the development of the Snake River for navigation improvement and flood control. Plans for the construction of four dams on the lower Snake were presented about six months ago. The Bureau of Reclamation presented its plans as a power generating scheme with power sale profits allocated to repaying construction costs of irrigation projects in eastern Oregon and southwestern Idaho.

At the same meeting of the Columbia Basin Inter-Agency Committee the Department of the Interior presented a resource development program for the Pacific Northwest that did not receive the approval of members of the committee. The program called for irrigation of 1.8 million acres of additional land and installation of 5,000,000 kw. of power generating capacity by 1960, and also comprehensive investigations into mineral resource development and utilization, fish and wild life conservation, and region-wide recreational development and planning.

Several members of the committee criticized the program as being vague and too jumbled to be readily understandable. Annual cost of the Department of the Interior's ten-year plan was estimated at $300,000,000, which would be repaid in part, directly by power sale revenues and water users, and in part, indirectly by federal tax revenues on increased production generated by the improvements to be made.

Construction Design Chart

XCII . . . Balanced Tensile Reinforcing

By JAMES R. GRIFFITH
Civil Engineer
Seattle, Wash.

THE ACCOMPANYING chart is the last of three companion charts on balanced tensile reinforcing in concrete beams which have been prepared for an allowable stress in the reinforcing steel of

$$f_s = 20{,}000 \text{ p.s.i.}$$

During my own experience I have seen the allowable stress in reinforcing steel increase from 16,000 to 18,000, and then to 20,000 p.s.i. Therefore, the allowable stress as used in these charts will no doubt be lower than the values used for current practice a decade from now. In fact even at this time the Joint Committee Report allows for such an increase in one-way slabs where wire mesh or bars not exceeding ½ in. in diameter are used.

I have heard arguments propounded relative to the economy of using higher stresses. The use of such charts as these permit quickly ascertaining the effect of such changes although the ultimate economy involves the relative cost of materials as well as quantities. In the Aug., 1946, issue a problem was solved wherein $f'_c = 2{,}000$ p.s.i. and $f_s = 20{,}000$ p.s.i. Assuming a section with $b = 13$ in., and $d = 20$ in., it was found that the total resisting moment would be 68 ft. kips, and would require reinforcing of $A_s = 2.38$ sq. in. On the accompanying chart, a solution line has been drawn using the same resisting moment and area of reinforcing steel as above. Thus it will be seen that for $f'_c = 3{,}000$ and $f_s = 20{,}000$, the beam section could be reduced to $b = 9.1$ in., and $d = 19.5$ in. In order to check these figures obtained from the chart, we have:

$$M = K b d^2 = 236 \times 9.1 \times 19.5^2 = 817{,}000 \text{ in. lb.} = 68 \text{ ft. kips.}$$

$$A_s = p b d = 0.0136 \times 9.1 \times 19.5 = 2.4 \text{ sq. in.}$$

Some readers have no doubt questioned the application of the lower ranges shown on the charts for b and d. I have repeatedly found the need for these lower ranges when designing the structural elements for sewage treatment plants although I must confess that the general application is not too common. The lower values of d are handy for use with values of $b = 12$ in., when designing reinforced concrete walls. As an example of such application, let us assume that a unit width of wall in a rectangular pump pit will be subjected to a bending moment of 2.4 ft. kips, with $f'_c = 3{,}000$ and $f_s = 20{,}000$. A solution line may be drawn on the accompanying chart through values of $b = 12$ in., and $M = 2.4$ ft. kips, thereby obtaining the following results:

$A_s = 0.52$ sq. in. per ft.
$d = 3.2$ in.

By formula we would have

$$d = \sqrt{\frac{M}{Kb}} = \sqrt{\frac{2.4 \times 12 \times 1{,}000}{236 \times 12}} = 3.19 \text{ in.}$$

$$A_s = p b d = 0.0136 \times 12 \times 3.19 = 0.521 \text{ sq. in.}$$

At a higher level of the wall it may be advantageous to decrease the reinforcing steel to conform to the decreased bending moment, although in all probability the wall thickness would be maintained uniform. Thus if the bending moment reduces to a value of $M = 1.8$ ft. kips, and assuming the effective depth to still be $d = 3.2$ in., we would have then an unbalanced section in which

$$K = \frac{M}{bd^2} = \frac{1.8 \times 12 \times 1{,}000}{12 \times 3.2^2} = 176$$

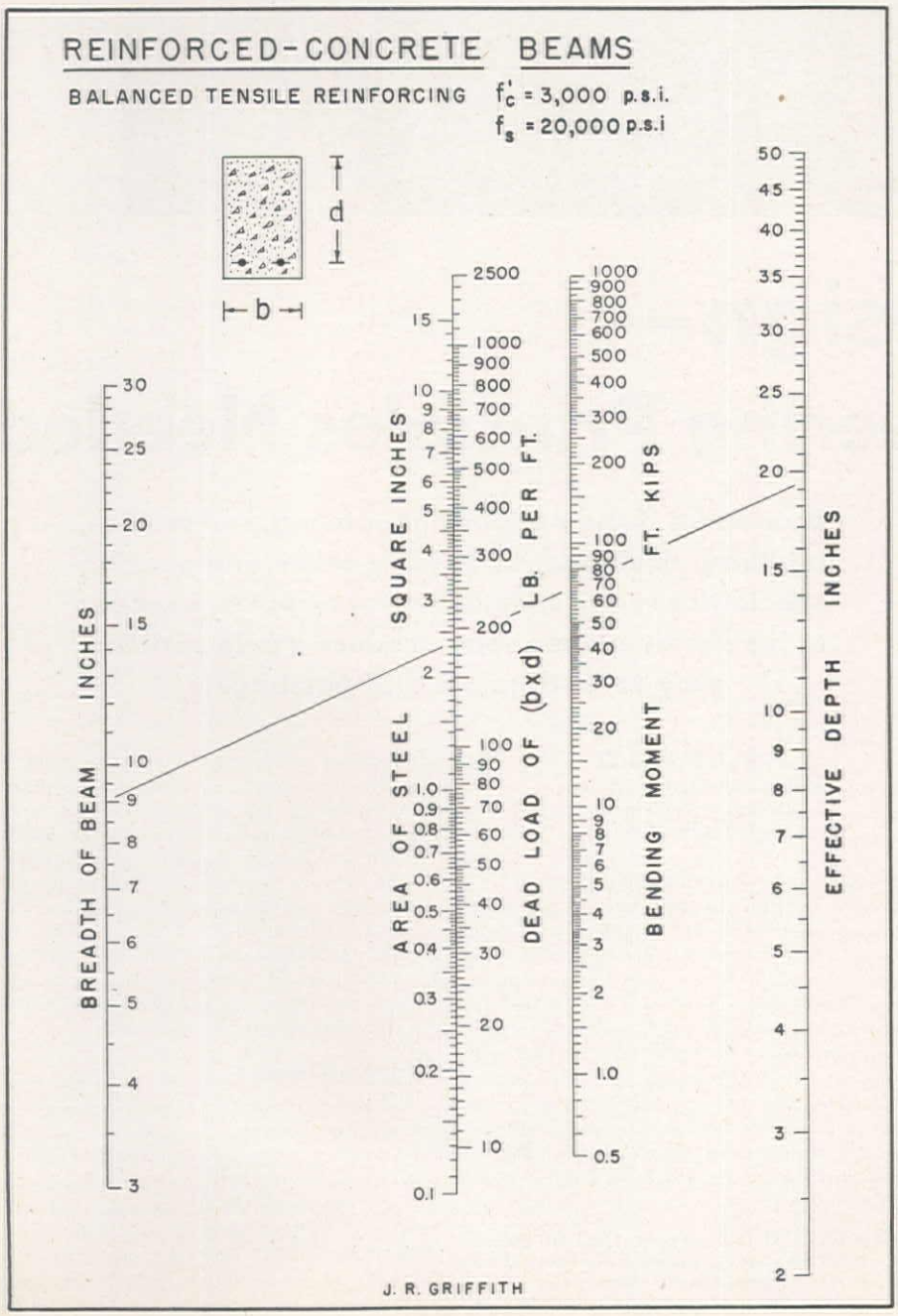
Since a value of $n = 10$ must be used with concrete having an ultimate strength of $f'_c = 3{,}000$ p.s.i., the chart published in the Oct., 1946, issue, for unbalanced reinforcing is applicable. If a line is drawn on that chart through the value $K = 176$, it will be seen that the stress in the reinforcing steel controls, and we would then have:

$f_s = 20{,}000$ p.s.i.
$f_c = 1{,}120$ p.s.i.
$p = 0.0106$

The required area of reinforcing steel is then

$$A_s = p b d = 0.0106 \times 12 \times 3.2 = 0.408 \text{ sq. in.}$$

When designing walls in which the amount of reinforcing steel may vary at different levels, I find it advantageous to plot to scale the values of M and A_s. It is then a simple matter to fit the spacing of bars into the required area at different levels.



Airport Design—
Sound Engineering Principles Needed

Economics, future expansion, paving, soil studies, building, drainage, and many other engineering specialties required in design of airports, in order to justify investment and produce a field satisfactory to both pilots and passengers

By R. J. SCHULTZ
Chief of Landing Field Section,
Corps of Engineers
Los Angeles, Calif.

A WELL-DESIGNED airport means additional money in the pockets of the airport owner and operator. Adherence to sound engineering principles in developing the airport will provide the most economical ground facility based on considerations of money invested, annual operating and maintenance costs, and annual income. The successful engineering of an airport requires that adequate consideration be given in the initial design work, to accessibility to centers of population and existing transportation facilities, arrangement of runways, taxiways, aprons, hangars, and service facilities, design criteria to be followed, funds available, and construction schedules and costs. The problems encountered in the field of airport design are comprehensive, and successful solutions require engineering services that run the gamut of the branches of engineering.

It is to be noted that because of the relatively unstable nature of present design criteria for airport landing areas, it is highly essential that the airport designer know not only the particular construction features desired for the immediate project, but also the ultimate use and expansion planned for the airport. The fact that weights and flying characteristics of the future plant, and probable future traffic densities, information needed to prepare a planned master plan of the airport, are not known, is recognized. However, to ignore these factors or to misinterpret their probable effect on the ultimate project may lead to pyramiding of construction costs for each step in the airport expansion program, and will probably provide an airport landing area that is unwieldy to operate and uneconomical to maintain. Provision should be made for including a design engineer on all airport planning work, along with the airport operator, aircraft designer, and planning specialist. Through such action, everyone will know the probable trends in aircraft design, the problems of the airport operator and his proposed solutions, and the design engineer will be in a position to apply the techniques of his profession to the best advantage to produce the most economical and practical airport landing area for the established design assumptions.

ARCATA, CALIF., airport (top of page) was built by Navy immediately atop cliffs which rise almost directly out of the ocean surf, example of first-class airport design.

Design problems

What factors enter into the design of the airport landing area, particularly as they relate to operation and maintenance problems? In the first place, the design engineer should know that the responsible management officials have determined that there is a need for the airport or for reconstructing existing facilities. Strictly speaking, the deter-

mination of the necessity for the proposed work is an engineering problem of the first order, requiring detailed study on site selection, traffic potentialities, possible future expansion, and detailed design studies. On the other hand, if the site has been selected and the required preliminary planning work completed by other groups or individuals, the role of the design engineer will be limited largely to grading, pavement, and drainage design studies and the preparation of contract plans and specifications. Principles of good management dictate that the design engineer know as nearly as possible the exact work expected of him, and the limitations or extent of his responsibilities.

Assuming that a site has been found that meets all the engineering and functional requirements of a good airport, the next step in the design engineer's approach to the problem is the question of funds available. The prime questions are: what is the amount of money actually available for the proposed project; can the desired facilities be built with the money available; what units of the project are needed most in case elimination of certain features of the work are necessary in order to stay within the available funds; and is the nature of the project such that the work could proceed on a modified scale or should the project be postponed completely until sufficient funds are available?

The construction directive should state clearly the scope of the work to be accomplished and the general design criteria to be followed. Officials responsible for issuing construction directives should take into consideration the fact that preliminary estimates of cost used in planning the project may be several years old and do not reflect current construction costs, and that the basic survey data on which the preliminary estimate was based may not have been of sufficient completeness to provide an accurate picture of the amount of work required to complete the job. Modifications may have to be made when accurate information on the above items becomes available. Additional modifications in the scope of the work may have to be made because of new developments in aircraft design.

Another factor entering the design picture at this point is the determination of whether the project is to be completed in its entirety under one general construction contract, or whether it would be better to split up the work into say a grading and drainage contract, a paving contract, a lighting contract, and a contract for hangar construction. Hangar construction falls in the field of building construction and experience has shown that better results are usually obtained if this type of work is accomplished on a separate contract basis. The determination of whether the grading, drainage, paving, and lighting work are to be accomplished under one prime contract or separate contracts will depend on the size of job, competition among contractors, the local labor situation and the availability of construction materials. A job costing $500,000 or more will usually be of sufficient size to attract tenders from general contractors who are equipped and qualified to handle all phases of the work as prime constructors. Throwing the job into a single contract lessens the administrative work on the contracting agency, but has the disadvantage of eliminating the small contractor who cannot meet the bond requirements encountered in the larger jobs. It is the job of the design engineer to properly evaluate the special construction features of the job and to design the job in such a manner as to insure that the contractor will be able to make maximum use of standard grading, paving, and ditching equipment.

If the work is to be accomplished on a continuing basis, that is, a certain amount of construction funds are to be made available over a definite period of years, a different design approach is required. The design must be adapted to methods of stage construction. Under this method of approach, it is essential that the airport owner and operator clearly understand the basic design assumptions and the resulting airport facilities that they will receive. In a program of stage construction, it is almost mandatory that the design for the first stage provide for the basic grading and drainage work, and for the initial construction of the pavement subgrade or foundation. With the funds available for a certain project, it may be possible to grade the landing strip area, install the basic drainage facilities, and to construct sufficient of the runway and taxiway cross sections to provide only pavement at the ends of the runways and at turning points in the taxiways. The pavement design for the rest of the runway and taxiway sections would then consist only of fine grading and compacting the soil to the density and theoretical thickness required for the design wheel loads. A light field-mix wearing surface would probably be applied on the portions of the runways and taxiways falling between the paved ends and turning points. The design engineer would submit such a design only on the premise that the expected traffic for the first year or two of operation would not be of sufficient intensity and loading to destroy the light field-mix surfacing, and that funds would be made available for a new surface course at such time as the field-mix pavement showed signs of failing.

Detailed cost studies will probably show that stage construction is more costly than a single construction program. However, there are certain intangible factors that tend to offset the additional construction cost. The light field-mix pavement may last a year or two longer than the design engineer originally assumed, thus making it pos-

BASE CONSTRUCTION on an airport is illustrated by Lancaster, Calif., airfield, built during the war. Unsuitable clayey soil is removed, top, replaced with sand and gravel. Above this, bottom, was placed a base course of crushed rock, compacted by rolling.

HANGAR DESIGN is another important feature of airport construction, as is also the planning of taxiways and aprons to serve them. This picture was taken during construction of aprons and hangars at McChord Field, Army field near Fort Lewis, Wash.

sible to postpone costly repaving operations. Also, actual field operations will show up weak points in the design, thus allowing for modifications or corrections to be made in the design as the airport expands.

Engineering costs

The particular financial problems faced by the airport owner and operator in developing an airport landing area of the Civil Aeronautics Authority Class 1 or 2 rating are very complex and critical. It is admittedly hard for an airport owner or operator to justify say, a $4,000 engineering fee on a $40,000 project, in which the main item of work involves primarily the leveling off of bumps and the filling of depressions. Over a period of years, however, a well-engineered airport will pay out over a hit-or-miss project. Perhaps all that is needed in many cases for the Class 1 or 2 airport is a topographic survey, sufficient soil sampling and laboratory tests to clarify the soil, and engineering recommendations as to methods of stabilizing the soil to increase its bearing power and recommendations for draining the airport. It is up to the design engineer to make sure that his client or employer understands completely the services he is getting for his money.

In this connection, it is desirable to point out that on the average, the preparation of an adequate airport layout drawing and construction detail drawings will cost in the neighborhood of $175 per sheet. A topographic survey will cost approximately $400 per acre, and a soils investigation around $50 per sample (for a minimum of 10 samples). From the above, it would seem that for the smaller airport jobs, it would be more economical for the airport owner or operator to hire their own draftsman and surveymen, and then for the technical work in soils and engineering design and review, to hire a consulting engineer. The services of a consulting engineer will probably run around $100 per day and for the average small airport in the West, 2 or 3 days should suffice for the technical design and review work.

Good design practice calls for the work to be set up on a contract basis. Accomplishment of the work on a contract basis normally insures that experienced construction men will be on the job and, therefore, that the completed project will approach more nearly the desired design standards.

Design criteria

Feeder, transport, and international airports are emerging on the design scene at the present time. Much development work is due in the field of feeder airports. Witness the fact that the City of Chicago has just started construction on a 2,800-ft. landing strip on Northerly Island. This project will cost $1,600,000 and will reduce the time from downtown Chicago to the main air terminal or transport airport to 7 min. No hangars will be built nor will storage space be provided, but plane servicing facilities will be available. The transport airport is the "workhorse" in the air transportation system at the present time. It is interesting to note that recent records show that of 289 runways in our commercial airports authorized for 4-engine operation, 15 per cent are under 4,000 ft., figured at equivalent sea level. Attention is invited to the fact that President Truman's Operational Board on air safety has under consideration the closing of all runways under 4,000 ft. in length to 4-engine aircraft.

The point is, that already the airplane has outstripped the airport and extensive modernization of existing runways will soon be required in most instances. International airports, mentioned previously as the third type of airport emerging on the design scene at the present time, must be classed as major public work. Pavement costs alone for a 7,000-ft. runway run well over a million dollars. Financing of such projects calls for special bond issues and frequently special legislative action, and much of their initial construction costs have to be written off as an outright subsidy to the air transport industry. Site location, probable traffic loads and intensities, and the economics of time spent in ground travel from the population center to the airport versus land costs are special engineering problems encountered in designing the international airport. The larger coastal and interior cities will in all probability eventually have international type airports.

Runway alignment

The number and alignment of the runways is one of the major engineering problems facing the design engineer. The total number of runways at a particular site will depend on the operational characteristics of aircraft expected to use the airport, the types of operations contemplated, the anticipated volume of traffic, and the velocity and direction of surface winds prevailing at the site. Standard CAA criteria require that the runways for Class 4 airports be sufficient in number to permit take-offs and landings within two points (22½ degrees) of the true wind direction for 90 per cent of winds 4 mi. per hr. and over. For Class 1 airports the above criteria is modified to the extent that the 90 per cent of winds 4 mi. per hr. and over is reduced to 70 per cent. In the West, in most instances, the prevailing winds above 4 mi. per hr. blow in one direction for 90 per cent or more of the time. Therefore, flight operations are actually built around a one-runway system. With the heavier type of airplane, the effect of wind velocity on take-off and landing operations is considerably less. With the smaller type aircraft, it is desirable that the runway system be developed to have a total minimum wind coverage of approximately 95 per cent.

A considerable saving in grading and drainage costs can often be made by shifting the alignment of the runway a few degrees one way or another to take advantage of more favorable topographical features. This will usually have very little effect on flight operations.

With the advent of larger planes and higher landing speeds, the importance of proper design of the runway approach zone becomes more critical. Current CAA criteria for instrument runways require that the approach zone begin at the end of the runway with a total width of 1,000 ft. This width increases to 4,000 ft. at a distance of 2 mi. from the end of the runway. For non-instrument runways, the above width figures change to 500 and 2,500 ft. respectively. The glide angle in the approach zone is figured from the elevation of the runway end and varies from one vertical on 20 horizontal for Class I airports to one vertical on 40 horizontal for Class 4 airports. Perpendicular to the direction of the runway, the clearance angle is one vertical on 7, carried to a height of 150 ft. above the elevation of the runway end. Trees, power poles, and buildings within the approach zone and protruding above the glide angle are definite flight hazards and should be removed if at all possible. Lighting of all obstructions should be the first design step, with removal operations fol-

lowing as funds become available. For new airports, obtaining aviation easements should be given as much consideration as is given to the proper design of airport ground facilities themselves.

Clear zones or over-run areas at the ends of runways are another design feature that must be included in all new airports, and where possible, added to the ends of existing runways. It is desirable that these clear zones be at least 1,000 ft. long, and that they be graded to meet criteria applicable to runway design. If the property line fence passes through the clear zone, or near the end of the runway, good design practice would call for the fence to be built as a knock-down unit; that is, in short individual sections that would offer little resistance to a plane that happened to overshoot or undershoot the runway. Where existing surface transportation lines and surface drainage lines cross the clear zone or cross the approach zone near the end of the runway, careful thought should be given to constructing at grade ramps over these lines so that in case of overshooting or undershooting the airplane will not be damaged to the extent that it is a complete loss. There seems no logical reason to go to great effort to provide a graded landing strip right up to the property line, and then leave a fence, street curbs, ditches, railroad tracks, and power lines just beyond the end of the runway pavement.

Runway length for the various classes of air fields is given in CAA design manuals. For the transport type airport, a 5,000-ft. runway, figured at sea level, seems to be the minimum that should be considered for the present 4-engine type aircraft. The determination of the ultimate length of runways will depend on the size of the future airplane, the load formula used in computing the allowable take-off load and the degree of safety required after the airplane is airborne. The present indications are that for the international airport, the ultimate length of the runways, figured at sea level, will be approximately 10,000 ft. Lengths greater than 10,000 ft. interfere with normal traffic through and around the airport and also drainage facilities required to divert run-off through and around the airport become major hydraulic works.

Airport loadings

The determination of the proper design load for the various facilities in the airport landing area is another engineering problem that requires considerable technical skill or ability. It may be possible to land a plane having a gross load of 74,000 lb. on a concrete slab or asphaltic pavement designed for only 50,000-lb. loads. Repetition of overstressing is the factor that will determine the behavior of the lighter pavement under the heavier loads. In other words, the lighter pavement may take one or two overstressings a day over a period of a year or two without extensive structural damage. The structural design of drainage facilities in the landing strip area is another problem calling for considerable judgment. What load should be used in designing such structures? Experience has shown that drainage and other underground facilities should be designed initially for the heaviest plane load expected on the airport. If the structure has to be rebuilt, the eventual cost is usually more than double the original cost of the more conservative design.

The design engineer must know something about soils and the principles of soils mechanics. Primarily, he is interested in the physical properties and composition of the surface soils and of the underlying parent materials, and in the behavior of the soils under load. This information can only be obtained through extensive field sampling and laboratory tests.

Laboratory tests show that for a given compactive effort, there is a moisture content for each soil at which maximum density and load bearing capacity will be obtained. Therefore, if the soil is brought to the right moisture content, and if the compaction is carried to sufficient depth, it is evident that the possibility of failure of the soil mass under the load through shearing action or consolidation can be virtually eliminated. The design problem is to determine the depths to which the compactive effort should be carried for a given wheel load. If adequate drainage and surface sealing of the compacted soil mass is provided, there is no reason why advantage cannot be taken of the load bearing capacity of soils of the silt, sand, and gravel groups, in designing runway, taxiway, and parking apron pavements. Clay type soils may lose bearing capacity when disturbed through compaction operations. Therefore, in working with clays, the engineer must normally build his design around a scheme that will cause the least disturbance to the clay soil.

Paving design

Normally, for Class 3 airports and higher, a paved surface is required for runways, taxiways, and aprons. Factors entering into the computation of pavement thickness are: characteristics of subgrade soil, magnitude of wheel load, tire imprint area, quantity of traffic, and expected life of pavement. In the design of pavements, considerable savings in cost can be effected if the main runway is designed for, say, the heavier type of aircraft and the other runways designed for limited operation only. Shoulders can be compacted to take an occasional over-run by the heavier type planes.

The main items of paving design are subbase, base, and wearing surface. Subbase design involves compaction and treatment of the native soil to increase its bearing power. If the subbase material is a low type silt, consideration may have to be given to importing a higher type soil such as a silty sand of even a sand-gravel material. Base course design is usually built around a well-graded gravel or crushed rock. They usually vary in thickness from 6 to 18 in., depending on the load, subgrade material, and wearing surface.

Design of a wearing surface is a problem in material research. Design mixes, whether for concrete or asphaltic slabs, will have to be built around materials available. In selecting the proper type of wearing surface, the design engineer will again have to know something of the expected traffic intensities and loads. Jet motors pose another problem.

Often the design engineer is subjected to considerable pressure from local interests to use special materials or trade products in the design. In the first place, economics of design usually require that local materials be used. In many instances, if soil conditions are favorable, either cement or asphalt may be used to provide a stabilized native soil base or wearing surface. Cement stabilized bases with asphalt wearing surfaces are giving very satisfactory service at many airports throughout the West at the present time.

Additional facilities

The design of the airport is not complete without some reference to hangar facilities. Normally, the design engineer operates on some factor determined by expected peak flying rates. Also, either the hangar is to be primarily for storage and repair work or for storage only. Hangar areas may run from several thousand square feet in size to 80,000 or 90,000 sq. ft. The layout of all hangars and attendant parking aprons is one of the most critical and important parts of the design. Tentative ground elevations for all proposed hangar facilities and parking aprons should be determined in the initial design and planning work. The design engineer will have to give proper consideration to utilities required; water and electrical outlets will have to be included in the design, sanitary sewer facilities and underground steam lines provided. Parking area for automobiles and the pavement design therefore are other items entering into the design.

Development of an economical and efficient airport drainage system is one of the most important and difficult engineering problems encountered by the design engineer. Selection of the proper design storm, evaluation of surface conditions that affect the rainfall-runoff relationship, layout of the drainage system, and the hydraulic design of the required drainage works are the more important technical problems. For the western United States, it is believed that the best means of providing adequate airport drainage is to make maximum use of surface swales and gutters, and small pilot storm drains to remove storm runoff. For the higher types of airports, a small pilot channel in the center of the drainage swales, approximately 20 ft. wide, should be paved. This keeps the maximum amount of

This article is condensed from an address made by Mr. Schultz at the 1947 Short Course given by University of Southern California's College of Aeronautics at Hancock Field, Santa Maria, Calif., last fall.

water on the surface where it will do the most good in aiding vegetation, and by paving the low points of the swales hazardous sumps or soft spots in the airport terrain are eliminated.

The storm drain can be of relatively small capacity, its primary purpose being to carry the low residual flows that occur after the peak rainfall has stopped. It has been found that much of the damage to pavements is caused where these residual low flows continually flow over or adjacent to a paved surface. In this type of design, the major emphasis is on handling the low flows. Storms of above normal occurrence and intensity will pass through the drainage swales and across designed overflow sections in the taxiways. Good design practice calls for the utilization of small ponding basins, where possible, between the runways and taxiways to store temporary peak runoff. Duration of ponding in swales and designed storage basins does not appear to be a problem in areas where the annual rainfall is 15 in. or less. The practice of providing pilot storm drains, large drainage swales, with paved inverts, and the utilization of ponding basins is a new design development particularly adaptable to airport drainage.

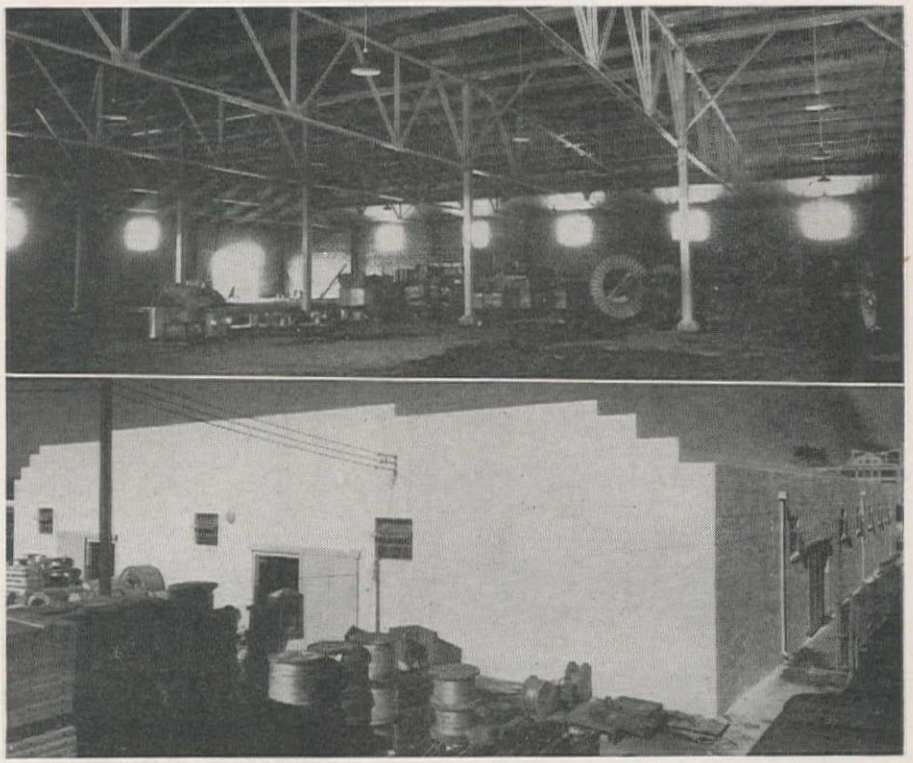
Airport maintenance

Maintenance of the airport is another factor that enters into the design engineer's calculations. The design assumption is usually made that Class 1 or 2 airport will receive little or no maintenance. For the higher type airport, it is usually assumed that sufficient funds will be available to provide continuous and adequate maintenance of all ground facilities. Airport maintenance is a special field in itself, requiring equipment ranging in type from farm to heavy construction machinery. The theory that the more a designer knows about field operations and maintenance problems the better designer he will be is sound and applies particularly well to airport work. It is up to the airport operator to let the design engineer know about his particular problems. To do this well it is evident that the airport operator should have a good administrative knowledge of the engineering features of airport construction.

From the above discussion of airport landing area design problems as related to operation and maintenance, it can be seen that the successful engineering of an airport project is a varied and complex job. A relatively minor design mistake on any one particular feature of the work may add thousands of dollars to the ultimate cost of the project, and affect greatly the economic operations and maintenance of the airport.

The major point to be driven home is that the design engineer must know not only the scope of the immediate project, but also the ultimate use and expansion planned for the airport. With this information he can provide a design that is not only basically sound and technically correct, but one that can be modified to meet changes in aircraft design and operating and maintenance techniques at a minimum of cost.

Know-How and Experience Construct Warehouse Building in Record Time



INTERIOR AND EXTERIOR of the warehouse at Emeryville, Calif. The structural steel, concrete block building was completed in 53 days at a unit cost of $3.09 per sq. ft.

AN ENVIABLE RECORD for speedy construction was made when a warehouse building at Emeryville, Calif., was turned over ready for occupancy just 53 days after construction was started. The building, erected for the Western Electric Co., is of structural steel and concrete block construction with a floor space of 120 by 180 ft. Cost for the building was only $3.09 per sq. ft.

Credit for the successful completion goes to the contractors, the Building Division of Vinnell Co., Inc., whose international headquarters are at Alhambra, Calif. G. Warren Schloat, chief engineer of the Building Division, had charge of plans, engineering and construction.

In undertaking the project, the Vinnell company sent to Emeryville a key organization, with the know-how and the experience in gearing each operation involved, in the effort to gain and save time. All materials and labor were supplied from the San Francisco Bay area, with the steel being provided through the facilities of the Steel Division of the contracting company. Delivery of steel to the job was made thirty days after start of the project. The Western Electric company supplied only water and power for the job.

The warehouse building is constructed of structural steel and concrete block. Besides the steel and masonry, the contract called for rough carpentry, hardware, sheet metal, roofing, windows, glazing, doors, exterior and interior painting, electric wiring and services and a sprinkler system. In addition, the contractors were required to clean up inside and out after construction was completed, and even to wash the windows.

The building was erected on a loading dock adjacent to Western Electric's local plant. The existing floor of the loading dock was used for the floor of the warehouse.

Within one week after the key organization from Alhambra arrived in Emeryville, foundations for the building were in and masonry work started. Within 35 days from the time work was started, all steel work was erected and in place. Steel included 16 trusses, 8 steel columns, struts, braces, anchors, bolts, etc.

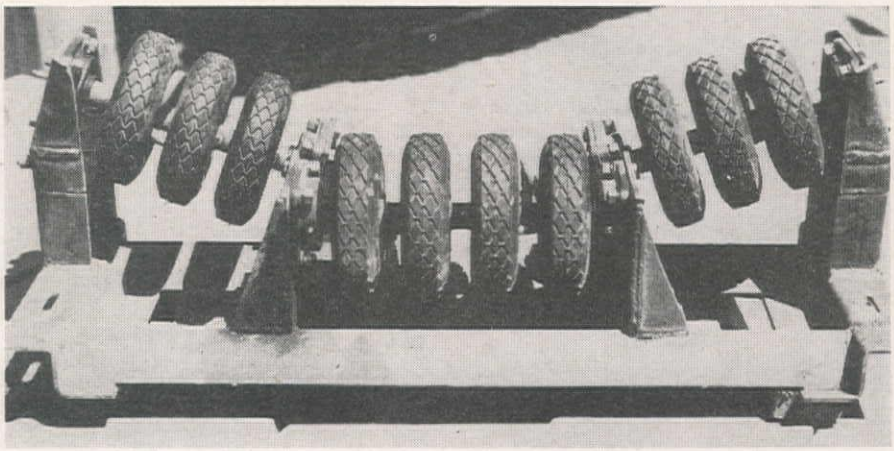
Exterior walls and wall columns are constructed of light weight concrete block units. Purlines are 6 by 12 in. while roof sheathing is 2 by 6-in. tongue and groove. Roofing is built up composition. Windows are of steel sash, glazed with wire glass. There are six sliding doors, 9 by 10 ft.; 54 electric light outlets with reflectors on underside of trusses and the wet sprinkler system is of the latest type.

Chief Engineer Schloat credited success of the project to pre-planning of the details of all operations and the broad experience of the construction crew. Plans, specifications and engineering for the building were prepared by Donald Beach Kirby and Thomas B. Mulvin, Architects Associated of San Francisco. M. D. Perkins was the structural engineer.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD

New Type Belt Conveyor Acts As Shock Absorber



A NEW TYPE impact-cushioning idler for belt conveyors supplements previous applications of pneumatic tires beneath belts to absorb the shock of falling material. Non-pneumatic, the new cushion idler consists of rubber rings mounted on the idler core instead of the conventional rubber-covered steel idler.

High resiliency of the rubber rings solves the impact problem by decelerating the lump. As a result, the life of even top quality belts is materially increased.

The new device is an adaptation of the principle which led to using a battery of pneumatic tires, mounted on shafts revolving in bearings, to protect the belt at dumping points in coal and ore mining, and rock products operations.

The use of tires as shock absorbers enables a conveyor belt to withstand extreme impact on operations handling heavy lumps up to a ton-and-a-half size. The rubber ring idler is designed for less severe impact conditions which do not require the use of tires. Belting engineers of Goodyear Tire & Rubber Co., Akron, Ohio, developed the new application.

Plywood Building Forms Treated With Plastic Solution for Additional Use

SCARCITY AND EXPENSE of plywood forms is a problem that can be avoided by the practice of dipping each form in a new plastic solution. The liquid may also be brushed on in two coats.

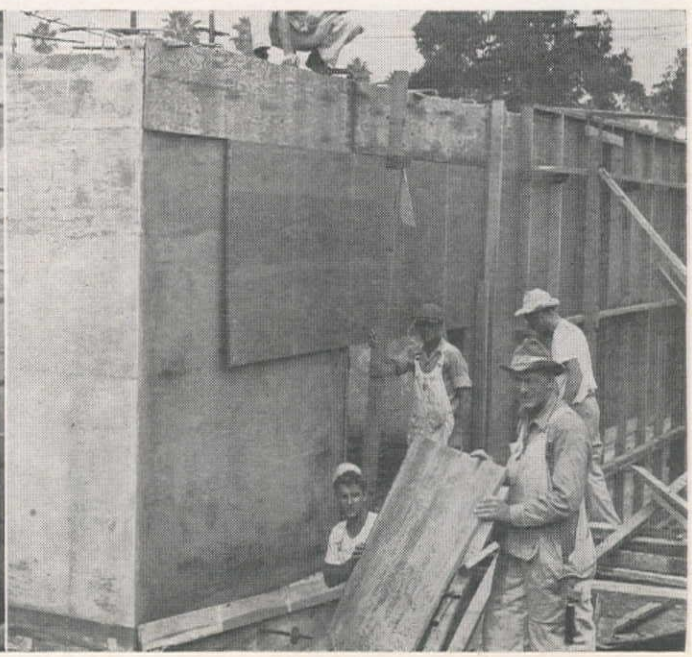
The new plastic solution, called Plastiglaze and manufactured by Calresin Corp., Culver City, Calif., is impervious to water and mild acids. It leaves a glossy finish on the form and penetrates the fiber to strengthen the wood. It forms a thin colorless coating which doesn't chip or peel.

The latest use for the air-dry plastic liquid was on construction of the Mission Orange Bottling Company's new plant at Alhambra, Calif. Ed Short, superintendent on the job for the Mathews Engineering Co., had all the sides and edges of all forms brushed with two coats. The forms were then sprayed with Hunt's process for a waxy surface so that the cement particles would not stick to the form.

The forms were then set up in order to make the separation walls. These varied in thickness from 4 to 7 in.

After the second day the forms were stripped, and the forms remained clean and undamaged. Short found that forms could be used seven or eight times. In the past forms had to be discarded after one using.

Photo at left shows workman of the California Gunite Co. applying gunite for a 7-in. wall at the Mission Bottling Company's new plant. The forms used have been brushed with the plastic solution. Right, workmen hold a treated form which shows little wear after being used to form the gunite wall. Forms were reused after brief spotting with the solution.

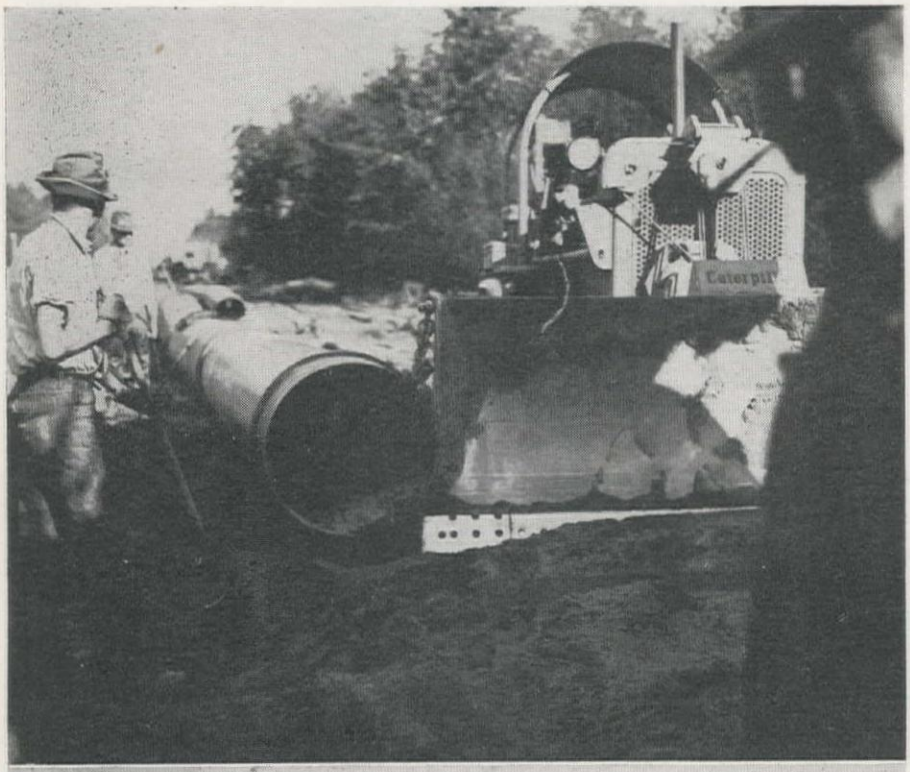


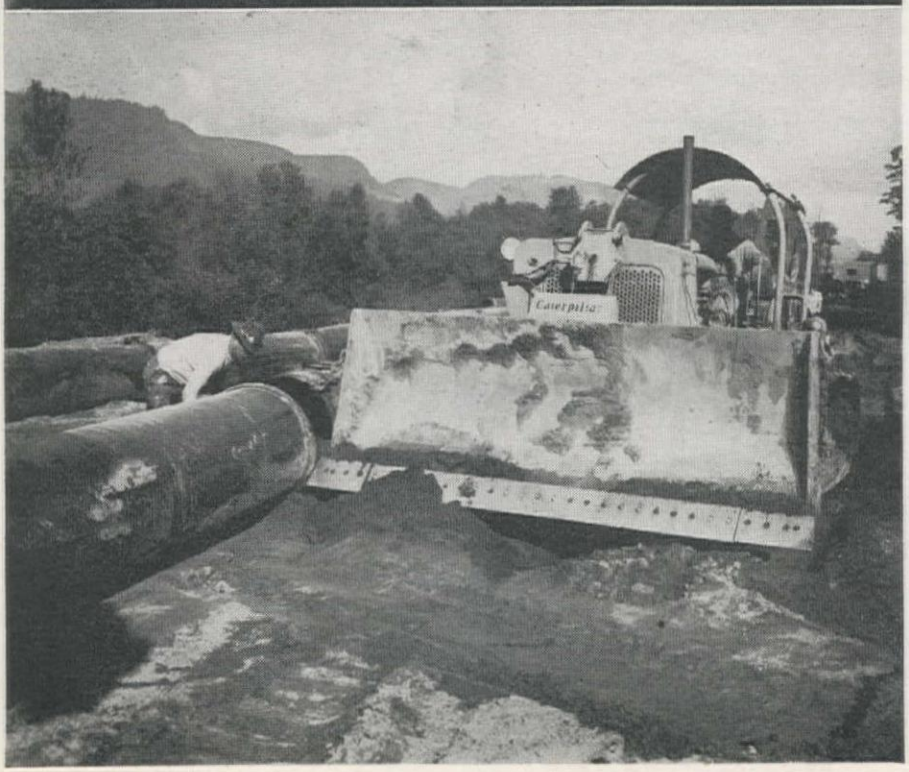
Use of Bulldozer and Special Chain Eliminates Need for Winch or Crane

ADVANCING THE DREDGE LINE by about 64 ft. per hour has been somewhat simplified by using a bulldozer-equipped tractor for all of the pipe handling. No hand lifting or moving of the pipe is required; neither is it necessary to keep a special winch or crane ready to handle the pipe sections.

Use of the bulldozer is made possible by a short length of heavy chain. A swivel eye at one end of the chain is bolted to the upper right corner of the dozer blade. At the other end is bolted a special lug which will slip easily over the rim of the pipe, and when tension is applied to the chain will grip the pipe firmly without the necessity of tightening any clamps or screws.

A bulldozer used around the grade operations is equipped with the chain, and when a pipe section is required the operator can bring a length from stockpile without assistance. Spotting the tractor at the left side of a 32-ft. pipe section with the blade at one end of the pipe, the operator drops the blade to the ground. The lug at the end of the chain is slipped over the pipe rim, the operator lifts the blade off the ground, and one end of the pipe is lifted off the ground with it. In this manner the pipe section is dragged to its future location in the line.





By nudging one end or the other with the bulldozer blade the pipe section can be linked up exactly. The nudging is done by braking one track and applying just enough power to the opposite track to swing the blade slightly. If the last section in place in the line is not at quite the right elevation to permit the next section to be slipped in, it can be raised by connecting the chain and raising the blade slightly, or it can be lowered by resting the weight of the dozer blade on the end of the pipe.

Once the two sections are lined up correctly, the chain is reattached to the new section and the pipe pulled backwards until the spigot end slides into the bell of the next section. Using this method the tractor operator with his machine and one other workman can readily add 64 ft. to the dredge line in 15 or 20 min. The system is in use on the Hydraulic Dredging Company's highway embankment job on the Columbia River highway between Bridal Veil and Corbett, Ore. E. George Smith is general superintendent in charge of the work.

Aluminum Shacks Readily Moved on Mounted Skids

WORK SHACKS of corrugated aluminum siding and roofing on timber frames makes movement of the shelters from place to place on the job relatively easy. Hydraulic Dredging Co., of Oakland, Calif., is using three of these sheds on its highway hydraulic fill job on the Columbia River highway near Bridal Veil, Ore. Two smaller sheds are used for storage of lubricants and small tools, and are spotted on the grade following the two portable trestles as construction of the fill progresses. The third, about twice as large as the other two, serves as the job headquarters with office space for the general superintendent, timekeeper, and accountant. Mounted on timber skids, the light buildings can be moved around the job readily. One move during the progress of construction required transfer of all equipment from Corbett Station to a point above Bridal Veil, a distance of about 15 mi.

NEWS OF WESTERN CONSTRUCTION

FEBRUARY, 1948

Loveland Tunnel Controversy Shakes Colorado Road Office

CONTROVERSIAL discussion over the Loveland Pass tunnel through Colorado's Continental Divide found numerous interested parties putting forth proposals aimed at clarifying the problem. The potential difficulties of construction and the allocation of funds for road projects within the state were the major moot questions entertained by participants in the growing debate.

State Highway Engineer Mark Watrous and his staff have indicated that the bore would cost from 7 to 10 million dollars and that construction problems inherent in the project would be the major factor in bringing costs to that figure. Attempts to get the job started by advertising the work in sections found no takers among tunnel contractors. So Watrous stated that, since the highway department has only a million dollars programmed for the Loveland Pass work, this money would be used for improvement of existing roads on both sides of the pass.

Secession of the western slope area from the rest of Colorado if the tunnel was not constructed this year was proposed by J. E. Samuelson, editor of the Glenwood Post, when the inaction became apparent. The western slope feels keenly the winter-time isolation caused when the coming of snow creates a natural dividing line down the middle of the state. From Durango to Rangely, cafes, hotels and restaurants are exhibiting signs: "Let's build Loveland Pass tunnel—Now!"

Glenwood Springs officials moved to form a new organization to represent the various towns along U. S. Highway 6 who have a pronounced interest in completion of the project. They proposed a plan for use of skilled geologists and mining engineers to make a special survey of the tunnel, without cost to the state, to clarify the engineering problems and help to bring a definite decision.

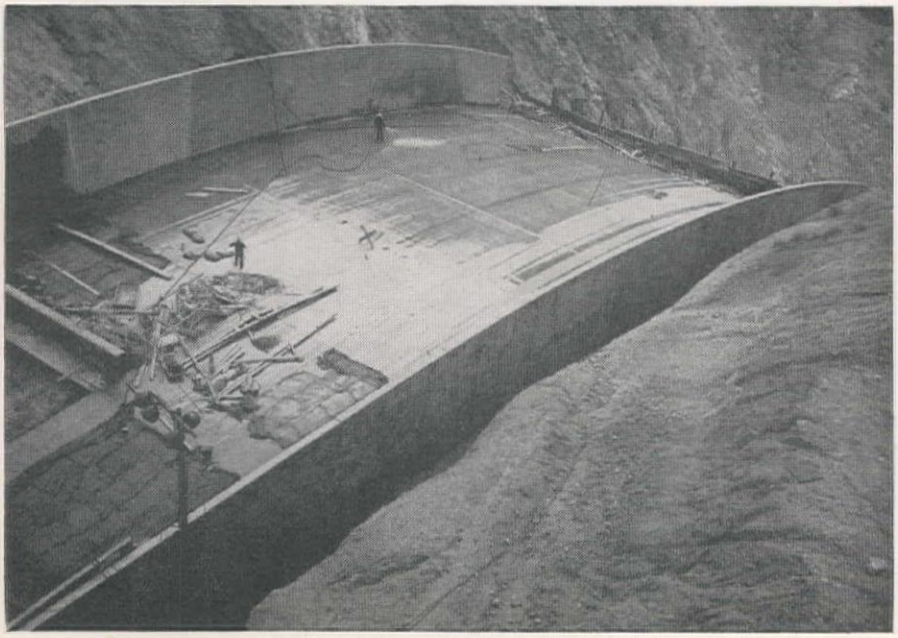
John C. Austin, noted tunnel authority, joined the controversy by stating that the tunnel boring would be a comparatively simple project entailing no complicated engineering problems. He advocated scrapping of "forty-year-old conceptions of tunnel construction," and said that, if he were given new specifications and permitted to bore into the mountain from headings at either end, he could complete the tunnel in one year.

Watrous acknowledged that it might be more efficient and less costly to advertise the entire tunnel as one project instead of advertising sections, but cited figures from construction of the Moffatt tunnel to support his contention that costs would run higher than estimates. The Moffatt tunnel, originally estimated at 6 million, was completed with a final cost of 18 million. He explained that the highway department budget would not allow advertising the entire project during one year and that contracts for sections of tunnels are not unusual.

OPEN-CHANNEL SPILLWAY AT ANDERSON RANCH DAM NEAR COMPLETION

A LARGE WATERFALL, approx. 340 ft. high, will some day start its plunge down this incline. The open-channel, concrete-lined chute, 100 ft. wide at the toe and 1,195 ft. long, will have a capacity of 20,000 cu. ft. per sec. Situated on the left abutment of the dam, it will carry the South Fork of the Boise River during periods of overflow. The earthfill forming Anderson Ranch Dam was completed last November.

Bureau of Reclamation Photo.



Tacoma Narrows Bridge Future Still Uncertain

ULTIMATE FATE of the Tacoma Narrows bridge reconstruction still is undecided after the Washington State Toll Bridge Authority failed to receive any offers for the purchase of bonds on the date set for opening. Representatives of a syndicate indicated to Authority officers that more time than was originally allowed would be necessary before the bond buyers could make an offer on the $14,000,000 issue.

An extension of 90 days, as asked by the bond buying syndicate, would extend considerably beyond the expiration date of the construction bids which were opened in October. However, the low bidders, Bethlehem Pacific Coast Steel Co. (for the steel superstructure)

and John A. Roebling and Sons Co. (for the cables), agreed to postponement of the construction contract awards until March 15 by which time the State Toll Bridge Authority hopes to have received a firm bid for the bonds whose sale will finance the construction.

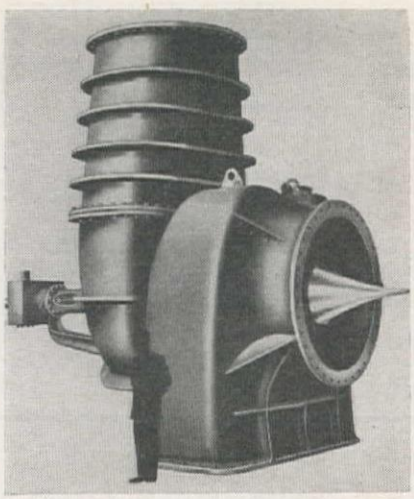
Idaho Bridge to Record Its Own Death Rattle

IDAHO Governor C. A. Robins and the state's highway department will soon be the recipients of a phonograph record which will emit squeaks and squawks of suspicious origin. The old Clearwater Bridge at Lewiston, Ida., is going to record its own death rattle for the benefit of the Governor.

The Lewiston Chamber of Commerce says it will transcribe squeaks and groans made by the bridge as cars and trucks move across it. The record will be sent to the legislators in Boise in an effort to convince them that a new bridge is a necessity.

A new $1,250,000 bridge has been approved but bids were rejected early in 1947 on grounds that they were too high. Since then Lewiston folk have been clamoring for action.

ARCHITECT'S PLANS and specifications for Los Angeles County's proposed $5,000,000 municipal courthouse are being blueprinted. The County Board of Supervisors have retained Beelman & Martin, architects, for a fee of 5.6 per cent of total cost, to prepare the plans and specifications. The structure will be located at the northwest corner of Hill and Temple Sts. in Los Angeles.



Huge Jet Pump Maintains Keswick Dam Pond Level

THE WORLD'S largest jet pump, made by Pacific Coast Engineering Co. for the Bureau of Reclamation, keeps fish alive in the Keswick Dam pond by pumping up to 153,000 gallons per minute. The huge 30-ton pump measures 14 ft. high, 13 ft. from front to back and has a 2-ft. high-pressure nozzle and a 5-ft. low-pressure nozzle. Head pressure is 80-93 ft., and discharge is against 7-ft. pressure.

It lifts water from the tail race anywhere from 3½ to 10 ft. With 30,000-lb. thrust on needle, the pump is capable of going from full open to close in 120 sec. Nozzle and nozzle seat are stainless steel. Operation of the pump is automatic and it maintains a level of the pond to within one inch of the desired depth.

HUGE STEEL TUBES REGIMENTED FOR INSTALLATION AT GRAND COULEE

TWELVE-FOOT DIAMETER tubes await installation in the discharge tunnels for the Grand Coulee Dam Pumping Plant on Eastern Washington's Columbia Basin Project. The pipe, being shipped to the dam from Western Pipe and Steel Co., San Francisco, under a $1,271,854 contract, will carry water for irrigation of 1,000,000 acres. Many units of the huge project are now under construction by Bureau of Reclamation.

Salt Lake Water Users Ask Congressional Aid

SUBSCRIBERS to the Provo River project in Utah are preparing to introduce into the current session of Congress legislation designed to provide an escape from a financing problem created by time and rising construction costs.

When the project was started ten years ago the estimated contractural obligations were $7,600,000 for the water collection and storage works and $5,550,000 for the Salt Lake aqueduct. Work was almost suspended during the war. When it was resumed costs were up to a point which far exceeded the authorized debt-incurring power of the subscribing units, including the Salt Lake Metropolitan Water District. New elections were held to lift the authorized debt ceilings. Salt Lake, for example, increased its obligation for the aqueduct to $8,043,000. But before contracts could be let costs were far above the increased limits. The Salt Lake water district could not again boost its debt obligation because of a constitutional limitation. So vital units of the project (five miles of the aqueduct and the Duchesne tunnel) cannot be completed without some new financing scheme.

The special legislation which will be sought for the project would authorize the Bureau of Reclamation to complete the project, retain control of it and sell water until the excess over the contractural obligation is paid off. At that time the facilities would be turned over to the subscribers and they would start regular payments on the contracts.

Spokane Asks Bids on Sewage Disposal Plant Project Unit

PLANS ARE BEING prepared by Charles E. Davis, city engineer of Spokane, for the first unit of the city's proposed $3,700,000 sewage disposal project. Division H, as the first unit is to be known, will consist of a 54-in. interceptor between Downriver golf links and the site of the proposed treatment plant on the Spokane River bank south of Baxter hospital. Bids are expected to be asked during February, and the action taken by contractors on the bid call will be an important factor in determining whether progress on the project will actively continue or be further postponed.

RANGELY, Colorado's boom oilfield, will have better access roads as a result of the 1948 State Highway Department budget. The budget allocates a total of $1,643,000 in state and federal money for roads in the Rangely vicinity, as compared to 1946 and 1947 totals of $627,986. Major portion of the fund will be used for improvement of the road from Meeker to Rangely. Frequent complaints have been raised against the condition of Rangely roads ever since oil development in the region began.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—This is written while they are waiting on the Hill for a rule from the Rules Committee of the House to determine whether or not the Rockwell Bill, affecting the 160-ac. limitation, may be debated by Congress. There is every reason to believe the rule will be favorable and that debate will ventilate the situation. What may happen as the result of the discussion is something only God knows.

The hearings on the D'Ewart Bill, H. R. 3194, which amends Section 9(e) of the 1939 Reclamation Project Act, were finally postponed indefinitely, for which the people on the projects of the West may be grateful. This act, which permits short term as well as long term water contracts is very important to the water users of the Central Valley as well as other areas of the irrigated West.

Ronald Harris, of the Water Users' Association of the Central Valley, found the compromise in the language of the amendment finally offered by Mike Straus unacceptable. Neither did the Legislative Committee of the National Reclamation Association deem the suggested modification of the amendment safe for the water users of the West.

Harris has gone back to California to discuss the business with his associates, and the National Reclamation Association is bulletining the suggestions to its membership. Out of these actions will probably flow sufficient mature thought to give valuable aid to the Congressional Committee in its future hearings.

The Legislative Committee of the National Reclamation Association has been meeting in Washington since Jan. 19, and is expected to be here until well into February. The Committee is giving consideration to the various bills and legislative proposals before the Congress. It is headed by Judge Clifford H. Stone, of Denver, and includes J. H. Moeur, Phoenix; W. F. Flinn, Miles City, Mont.; Association President Harry E. Polk, and Secretary-Manager Don McBride. W. F. Wilkerson, of Casper, Wyo.; Fred E. Wilson, Albuquerque, N. M.; and Robert W. Sawyer, Bend, Ore., members of the Executive Committee, also joined the group.

Colorado Basin free-for-all

The McCarran Resolution, which attempts smoothly to put off the evil day of solving the controversy between Arizona and California about the allocation of the waters of the Colorado River, naturally was one of the subjects most seriously discussed. While the McCarran Resolution apparently is of major interest chiefly to the three states of the Lower Basin, it actually involves all the states which signed the original Compact.

We get the impression here that Judge McCarran's Resolution, introduced in the Senate, actually will start another fight, a sort of inter-basin free-for-all; and that it will, at best, hold up the development of the Colorado Basin for not less than another 8 or 10 years. The feeling here is that the states of the Basin should join in the effort to settle the conflict between Arizona and California for the simple reason that if the lower states get into a tangle which will finally go to the Supreme Court, the interests of each state will be jeopardized by that delay and by other effects.

Most of the California delegation in Congress are very pessimistic and gloomy over the prospect of finding any grounds for a composition of the dispute; they say Arizona will not settle by treaty; that arbitration is not practicable; and that a juridical process of solution is the only way left. Apparently many of the California delegation are not altogether certain that a process through the Courts will give Southern California what it thinks it is entitled to and what it needs. There is considerable discussion over the problem of California's solution of the need, if it cannot depend upon the water of the Colorado River in the future.

Election-year Budget

The President's Budget, as recently presented to the Congress, asks $240,661,000 for the Bureau of Reclamation; $663,450,750 for Army Engineers' civil works program, which is Flood Control and Harbors and Rivers work. He asked $200,000,000 for Army military construction work; $460,588,854 for Public Roads; $32,137,000 for Alaska; $23,225,000 for Bonneville; $12,569,300 for Indians and $2,000,000 for public buildings.

ARNOLD KRUCKMAN

Scrutiny of some details reveals $30,400,000 is asked for Garrison Dam on the Missouri; $7,000,000 for Lookout Point Reservoir in Oregon. McNary Dam will get $30,000,000 if the President's Budget is accepted; and Fort Peck Dam on the Missouri would get $7,000,000.

Most of the reclamation funds are intended for projects now under way: $48,000,000 for Columbia Basin; $63,900,000 for Central Valley; $23,000,000 for Colorado-Big Thompson; $24,000,000 for Davis Dam; $9,850,000 for the Hungry Horse Project, Montana; $5,800,000 for Anderson Ranch Dam; $4,484,000 for the All-American Canal; $3,000,000 for the Gila Project.

Over $57,000,000 of the reclamation funds are earmarked purely for power expenditures. The Southwestern Power Administration budget is camouflaged by inclusion in the funds for the "Office of the Secretary of the Interior." It is cloaked as a request for $3,000,000 to be used for the construction of transmission lines.

An effort is again made to revive the socialistic Power Division of the Interior by asking for $104,106. The feeling here is that the reclamation and power budget items will not be cut to any great extent, it being election year, but that very sharp curbs will be imposed upon the administrative functions of the agencies which spend the money. It is significant that over $1,000,000,000 is asked for Federal electric power projects and activities. Incidentally, TVA is budgeted for $100,000,000 more money this year than last, this being the money it spends without responsibility to Congress, despite its technical protests to the contrary.

No cut in Western funds

It is notable that the items which come within the orbit of Western interest total over $2,000,000,000. In Congress you hear that the trimming of possibly $5,000,000,000 from the President's budget will not come to any appreciable extent from appropriations that concern the West. Congress is largely sympathetic to the West by reason of the election influences. This is very genuinely because many Members who were out there during the recess have felt much more justification for the expenditures after learning the reasons for them while they toured the Western country.

There will be vigorous attacks upon the payrolls of units such as the Rural Electrification Administration. Particularly there will be heavy firing—in both senses—in connection with the public relations men. REA claims it needs 23 or more of these experts in order to educate the rural population. There is a feeling that some of this "education" may go far afield from the purely technical problems of the REA. The particular examination of these phases will be made by at least three Committees: the Senate Civil Service Committee, the House Committee on Expenditures, and

the House Committee on Small Business. Some of these enquiries will be directed at lobbying by Federal Government units.

Further expenditures

The President's Budget also carries an item of $9,414,150 for National Park Service roads, $21,700,000 for reconstruction of the Alaska Railway and $29,000,000 for highways in Alaska. CAA asks $40,000,000 to build new airports, and the National Advisory Committee for Aeronautics asks $40,000,000, some of which is to be spent for substantial construction at Moffett Field, Calif.

Money expended on surveys would include $6,000,000 for the Bureau of Reclamation; $3,500,000 for flood control; $2,000,000 for Rivers and Harbors and $2,100,000 for flood control surveys by the Department of Agriculture. $13,000,000 is to be spent by the Bureau of Reclamation and Corps of Engineers for advance planning.

Incidentally, the Federal Public Works agency, in its latest report to the President, asks that funds be provided for advance planning for $27,000,000,000 worth of public works, in order that a program may be ready in the event we have a sudden recession. Finally, Congress is requested to supply $19,000,000 for topographic mapping and for study of hydrologic data. Bonneville wants $37,000,000 to build power transmission systems.

On Christmas Eve the President signed the third supplemental appropriation law which supplied $72,000 for the Deschutes Project; $2,800,000 for the Davis Dam; $4,150,000 for the Colorado-Big Thompson Project; $11,405,000 for the Central Valley, to be spent: jointly, $1,273,600; irrigation, $8,771,600; Shasta power plant, $700,000; Keswick Dam, $145,000 and for the Keswick power plant, $514,800. Columbia Basin was given $13,584,000.

Krug is expendable

Rumors continue on the Hill that Secretary Krug will resign. Sen. O'Mahoney and Interior Undersecretary Chapman are mentioned as successors. Sen. Downey, Calif., wrote the President accusing Krug of misrepresentation in dealing with Congress about reclamation and allied matters. Mike Straus naturally also continues to come in for heavy criticism on the Hill. Republican and Democratic senators are expected to try to clean up the Reclamation Bureau, with a final demand for Straus' removal. Left-wingers are fighting vigorously to keep Mike and his crowd in office.

The situation is more than embarrassing to Krug, and jeopardizes his job. Also it is bad politics for the White House in an election year. The talk is that Straus and his crowd are regarded as expendable, if the pressure is insistent. Bear in mind, Krug is associated in the minds of the people on the Hill with Ed Pauley. Krug and Straus steadily insist no resignation is in prospect. The White House supports their statements. Objective observers, however, feel that Krug eventually will be dropped for the good of the campaign. That obviously means the end of Straus.

And the going of Straus would mean many changes in the Bureau of Reclamation. Recent bad guessing on funds required for Central Valley, and other projects, has caused the Reclamation Bureau to attack voluntarily a shift in book-keeping practices, according to word on the Hill, where they were planning to go into the methods with a searchlight, and to insist on reforms.

Construction of four proposed dams on the lower Snake River, and work on the McNary Dam, and other dams between Bonneville and Foster Creek, are fought militantly by the fishing industry of the Northwest. The representatives of the industry insist that too much emphasis has been placed on hydroelectric power instead of irrigation.

Professional employees

Early in January the National Labor Relations Board ruled that the 17 men employed by the Worthington Pump and Machinery Corp., Holyoke, Mass., as time-study experts, and who belong to the Time and Motion Study Association, an independent union, are entitled to participate in labor organizations under full protection of the Taft-Hartley Act. The Board held the men are professional employees, who determine standards on industrial operations for computing incentive bonuses, and are not primarily representatives of management, but come within the meaning of Section 2 (3) of the Act which defines the term employees. The ruling again emphasized that the term "professional employee" means "any employee engaged in work . . . involving the consistent exercise of discretion and judgment in its performance." The Company held the men were primarily representatives of management. The ruling is deemed to fix the status of all professional employees.

ARBA

Speaker Joseph W. Martin, Jr., of Massachusetts, was the principal speaker at the banquet of the American Road Builders' Association in the Capitol on the occasion of the three-day conference the last week in January. President J. T. Callaway, of the ARBA, introduced the guests at the banquet, and Congressman Paul Cunningham, Iowa, chairman of the House Sub-Committee on Roads, was the toastmaster. The list of speakers was made up of some of the best talent in the Capitol, including Congressman Karl Stefan, Nebraska; George L. Bell, Associate Director of the Office of International Trade; Gen. Philip B. Fleming, Federal Works Administrator; Congressman Jesse P. Wolcott, Michigan; Sen. Styles Bridges, New Hampshire; Commissioner Thomas H. MacDonald, Public Roads Administration; Congressman Clair Engle, California. Former Congressman Jennings Randolph, of West Virginia, now assistant to the President of the Capital Airlines, has been elected President of the Airport Division of the ARBA, and presided at the meeting of the State Aviation Officials. Westerners on the various programs of the conference included Claude L. McKesson, Los Angeles; H. F. Bussard, Marshall, Minn.; and Walter A. King, Topeka, Kan. Over 2,000 participants attended the conference, including highway officials, manufacturers, engineers, contractors, and educators from all parts of the country.

Miscellaneous

Associated General Contractors of America forecast a construction program exceeding an expenditure of $22,000,000,000 during 1948. Bureau of Labor Statistics reported a total of $12,900,000,000 for new construction spent in 1947; the over-all total, including outlay for minor building repairs, was $15,000,000,000 for the year, 28% above the 1946 outlay. The report stated that expenditures were at an all-time yearly high for all privately financed work, privately financed housing, and Federally financed conservation and development work. Contractors employed an average of 1,733,000 workers in 1947, the highest average since 1942. Incidentally, $3,000,000,000 was spent for public construction, the highest ever recorded for peacetime Federal, State, and local construction programs. Highway and road construction absorbed the greatest dollar volume, 40% of all public money spent during 1947.

The new Office of Economic Cooperation, which is the effort to sidestep controls, and which is the substitute for a WPB, obviously is not intended to be successful. It depends upon voluntary operation. The head, appointed by the President, a manufacturer of electrical equipment from Cleveland, Ohio, named John C. Virden, was quite frank in telling the first press conference he confronted that he did not expect the plan to work. Washington people generally assume the gesture is a sort of Trojan Horse, designed to force the adoption of arbitrary controls.

The Editor's Mail...

Circulation Director,
Western Construction News

Dear Sir:

Recently we have had a brief discussion about subscription to Western Construction News among Mr. Johnson, our District Manager in Los Angeles, Mr. Davies and myself. We have decided to send you our subscription for three years, which we are doing on the form attached sent to us by Mr. Herbert Dale of Long Beach. Also, enclosed is our Petty Cash Check No. 1437 in the amount of $10.00 in full payment for this subscription.

Nearly everyone in this office reads the Western Construction News and finds its articles most enlightening and enjoyable, particularly so when they refer to the activities of our own firm and its employees.

Sincerely,
Del E. Webb Construction Co.
Dale E. Griffith,
Assistant Business Manager

NEW BOOKS...

THEY WOULD RULE THE VALLEY—by Senator Sheridan Downey, United States Senator from California. Published privately. Copies available from Publisher's Service, Box 786, San Francisco 1, Calif. Ill., 256 pp., 6 x 9. Price $5.00.

The energetic antagonist of the provision in the Reclamation Act of 1902 which limits the delivery of water to a landowner on a federal reclamation project to the amount needed for the irrigation of 160 acres, has written this book with the desire to give the citizens of California a clear understanding of the effect the limitation will have if applied on the Central Valley Project. Primarily, it is a discussion of the farms and water resources of the Central Valley. Secondarily, it is a personal narrative of the efforts of a powerful government agency — the Department of Interior, including the Bureau of Reclamation—to impose by high-pressure lobbying and propaganda an economic straight jacket upon a sector of free and successful enterprise. A perusal of this book should convince the reader that alleged virtues of the land limitation are wholly counterfeit, and that if it were ever imposed, it would bring only discredit to its proponents and injury to those whom it was destined to aid—the small farmers. Senator Downey has marshalled the facts, and presented here the arguments which he says can admit but one verdict.

* * *

CONSTRUCTION ESTIMATES AND COSTS—by H. E. Pulver, B.S., C.E. Published by McGraw-Hill Book Co., 330 West 42nd St., New York 18, N. Y. 650 pp., 6 x 9½. Price $6.00.

This revised second edition is a practical manual for all concerned with accurate construction cost estimates. Step-by-step instructions are given for estimating construction work of various kinds, including excavations, all parts of buildings, concrete, structural steel, material transportation, profit and overhead. The edition takes up each element of construction work separately, and describes and illustrates simple, arithmetical methods of estimating costs. It takes into account the rise in wages and prices, and covers every step of the work. Tables and diagrams are included for estimating the different elements of construction. Both the tables and diagrams show variations in quantities as well as in prices of materials and labor. Diagrams are the straight-line type, easy to read and use.

* * *

THEORY OF LIMIT DESIGN—by John A. Van den Broek, Ph.D. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Ill., 5½ x 8½, 144 pp. Price $3.50.

Dr. Van den Broek, who has spent forty years in personal investigation of the problems of the limit design theory, believes that elastic stress never was a criterion of strength. In this book, he presents clearly and logically the fundamental principles which constitute a basis for the belief that ductile stress distribution, rather than elastic stress analysis, is more properly synonomous with the theory of strength. Carefully developing his arguments, the author has coordinated the simple criteria upon which limit design is based into an acceptable theory for design of redundant structures. An interesting feature of the book is its extensive treatment of column action. The author makes use of problems, formulae and examples to clarify the discussion. This is an important contribution to literature in the field of structural engineering.

New San Francisco Structure May Replace Ferry Building

CONSTRUCTION of a $15,000,000, 40-story building to replace San Francisco's historic Ferry Building on the Embarcadero and to be built by the San Francisco World Trade Center Authority has been proposed by President Thomas C. Coakley of the State Harbor Commission, a member of the Authority. Other members of the Authority received the proposal with enthusiasm, and investigation of the possibility is now under way.

Originally intended for erection on the site of the present produce market at Clay and Montgomery Sts., the building would be placed at the foot of Market St. to speed construction. Lengthy negotiations for acquisition of the produce district site would cause delay.

The State Attorney General's office has been asked to consider the legal problems involved. Despite the fact that the Authority is a state agency and the Ferry Building and environs is owned by the state, sale of the property from one agency to another will be necessary.

Utah and Nevada Wage War Over Snow Clouds

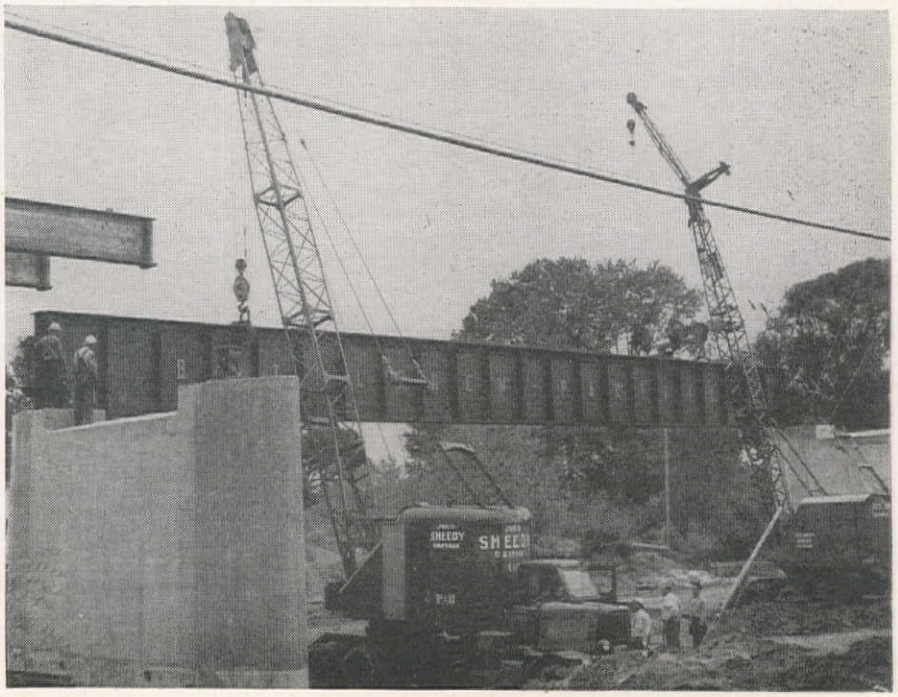
THE WAR OF WORDS between two snow-hungry states in January found Utah and Nevada exchanging counter-punches of pseudo-friendly ilk. The initial barrage came when Utah accused Nevada of illegally using dry ice pellets to bombard Utah-bound snow clouds, milking them of snow divinely-destined for the ski resort at Alta.

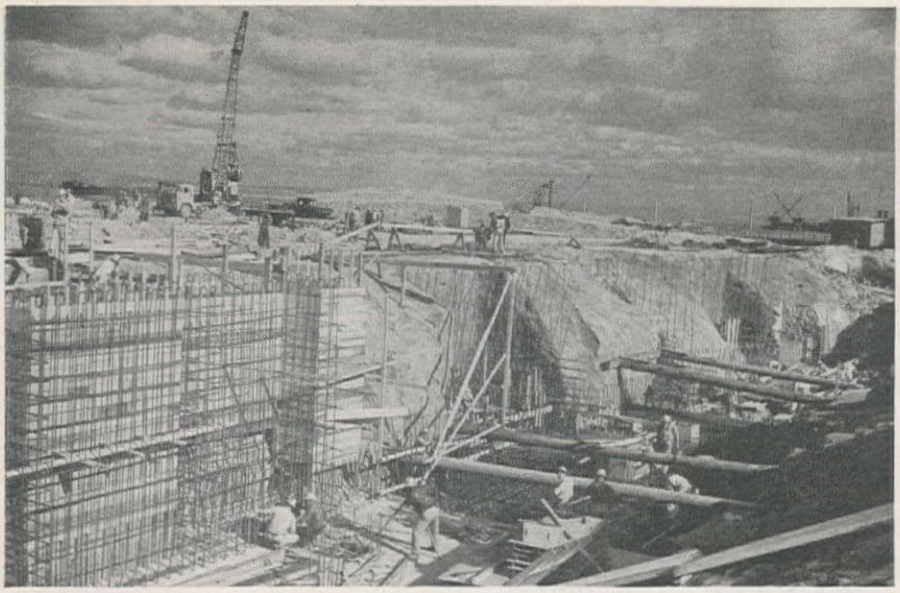
Nevada countermanded with the subtle reminder that Nevada taxes airlines for the ground they fly over. Consequently, if Utah claimed the Nevada clouds contain water belonging to Utah, then Nevada could tax the Beehive state for the ground the clouds pass over. Hostilities at this point entered a new phase when Nevada forwarded a carefully preserved snowball to Utah combatants.

Final blitzkrieg action came when Utah threatened to boycott shipments of carbon dioxide gas to Nevada. Utah is probably the nation's chief producer of the gas from which dry ice is made. A month-end lull in the controversy found both states pledging future co-operation.

30-TON STEEL GIRDER SWUNG INTO PLACE FOR HIGHWAY DECK BRIDGE

ONE OF FOUR 100-ft. girders to support the deck of a bridge over the Stanislaus River near Ripon, Calif. The new bridge will make possible a divided highway to accommodate two lane traffic in one direction, while the old bridge will serve traffic in opposite direction on U. S. Highway 99. The 495 tons of structural steel in the bridge was fabricated in Bethlehem Pacific Coast Steel Corporation's Alameda, Calif., plant.





SALT WATER INTAKE TUNNEL UNDER CONSTRUCTION AT HUNTER'S POINT

WATER PUMPED through the tunnel from San Francisco Bay will be used in the cooling systems of Pacific Gas & Electric Company's powerhouse at Hunter's Point. Reinforcing steel for retaining ground above the top of intake tunnel is also shown.

Bureau of Reclamation Reports Not Favorable to Two Arizona Projects

UNFAVORABLE reports have been made by the Bureau of Reclamation on two proposed irrigation projects in Arizona, the Chino Valley project, about 15 miles from Prescott and the Snowflake district about 30 miles south of Holbrook.

In the case of the Chino Valley project, it was determined that there was not sufficient water to irrigate adequately all the lands now under irrigation, that no new lands would be given water, and that the most practical method of increasing the water supply—that of lining the main canal to reduce excessive losses by seepage—has already been undertaken by the local district. The investigation further showed that the Chino Valley Irrigation District would not be able to pay for the project if constructed by the Bureau and also meet its outstanding obligations.

The Snowflake project involved 18,000 arable acres, of which 2,200 acres are now irrigated. Investigations here, however, disclosed that although the proposed project has engineering feasibility, further water resource development in the area would not be economically practicable. The Bureau's report showed that the water supply available would permit irrigation of 6,700 acres, including the land now irrigated. The $7,500,000 estimated cost of constructing a 40,000 ac. ft. storage reservoir, a tunnel to connect Silver and Showlow Creeks, and two new main canals, plus the annual operation and maintenance expenses, would be in excess of the irrigation district's ability to pay. Therefore, in the words of the report, "The question of authorization should be left open for reconsideration at such time as the economic need of the nation, lower construction costs, or other developments may justify such reconsideration."

OBITUARIES . . .

Nelson B. Taylor, 68, retired civil engineer, died in Tacoma on Dec. 24. A veteran of three wars, Mr. Taylor's colorful career included service in many parts of the world. He served with the U. S. Navy during the Spanish-American war, and from 1908 to 1916 was a member of the French foreign legion in Africa. During World War I he was employed by the Todd Drydock Co. in Tacoma and Seattle. Following that he entered the service of the Pan-American Mining Co., which took him to Venezuela. From 1935 to 1942 he was employed in the office of the Pierce County engineer, and during World War II he was engaged in the construction of McChord field near Tacoma.

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Edward G. Worth, 84, retired surveyor general of Oregon, died on Jan. 3, at Salem, Ore. A graduate of the University of Oregon's civil engineering department, Mr. Worth began his career as surveyman for the Oregon, Pacific and the Oregon Railway & Navigation Companies. For a time he was employed in the rivers and harbors section of the Corps of Engineers, and in 1904 he was appointed superintendent of construction for the United States Lighthouse Service in Alaska. He became surveyor general for Oregon in 1913, and retired after 9 yr. in that position.

* * *

Gilbert George Hall, 62, Senior Planning Technician in the office of the Regional Planning Engineer at Reno, Nev., died Dec. 19. He was one of the organizers and first president of the Reno Engineers Club, one of the first engineers licensed in the state of Oregon, and an Associate Member of the American Society of Civil Engineers since 1914. During World War II he served as civilian area engineer at the Sierra Reserve Depot, Herlong, Calif.

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Bennett E. Bennetsen, 58, contractor and construction engineer of Seattle, died Dec. 27. A native of Denmark, he had resided in the United States for 36 yr., of which the last eight were spent in Seattle.

* * *

Stanley H. Shave, 61, prominent building contractor, died Jan. 5 in a Burbank, Calif., hospital. He was founder of the Building Contractors' Association, originally a Southern California, now a national, organization. His most recent project had been Valley Market Town, a large community shopping center in Van Nuys, Calif.

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William V. Smith, 23, worker on the Boysen Dam project near Thermopolis, Wyo., was crushed to death Jan. 16 when he was caught by the pulley on a truck loader at the dam site.

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Harold T. McQuiston, 56, engineer with the Nevada State Highway Department in the Las Vegas division, died in Carson City Jan. 5. He had been an employee of the highway department since June, 1937.

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Philip S. Biegler, 68, dean of the school of engineering at the University of Southern California, died unexpectedly Jan. 13.

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Percy E. Hicks, 70, for several years Assistant City Engineer at Redlands, Calif., died Dec. 31 on his way to work. He was an expert on water problems, and had aided in laying out the subdivisions at Redlands and in Bear Valley.

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Samuel V. Epperson, 72, superintendent of the Coquille, Ore., municipal water system for the past 33 yr., died on Dec. 12. He was born in Calaveras County, California, and had resided in Coquille for the past 39 yr.

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A. Emory Wishon, 65, executive vice-president of the Pacific Gas & Electric Co., died Jan. 4 at his country home in Danville near San Francisco. He was a pioneer in the development of the power industry in California, and had been associated with P. G. & E. and its predecessor companies for 38 years.

Barker Named President of Intermountain Branch A. G. C.

ELECTED PRESIDENT of the Intermountain Branch, Associated General Contractors, is Ellis W. Barker. The elections were held at the annual membership meeting, held in the Hotel Utah, Salt Lake City, on January 24. Grant Thorn of Springville, Utah, is the retiring president.

Other officers elected to serve under Barker are: vice-president, Carl E. Nelson; secretary-treasurer, G. M. Paulsen, and directors, W. W. Gardner, Ed Dorland and Mark B. Garff.

At the meeting, retiring President Thorn announced the organization of a joint committee whose purpose will be to encourage a high standard of working relations between the construction industry and highway officials and to mutually promote a sound and efficient highway program. The committee will consist of two members of A.G.C., two from the State Road Commission, one from the Civil Aeronautics Administration, one from the Public Roads Administration and members from other public agencies.

The president's twenty-sixth annual banquet wound up the convention. Dr. Fredric P. Woellner of Los Angeles was guest speaker at the banquet.

New Bids Within Salt Lake Sewer Estimates

A SECOND set of bids has presumably cleared the way for early construction of the proposed Salt Lake County, Utah, suburban sewer system. Bids received on the first call were far in excess of the $2,750,000 which a bonding firm has agreed to loan on revenue bonds. But the second set of bids, totaling $2,438,374, would leave the district well within the financing agreement after $137,500 engineering costs, a $50,000 contingent fund and a disposal plant site have been added.

No single bids were received on the entire project. But a combination of low bids on units by several contractors amount to the $2,438,374. W. E. Thatcher of Ogden submitted the low bid of $278,500 on the disposal system.

County commissioners report that contracts will probably be let within the next few weeks and construction started in March.

Weed-Killer Spray Blamed For California Road Fires

WEED-KILLER SPRAY which the California Division of Highways has been using for two decades has been blamed for a series of spontaneous blazes along three long stretches of Southern California thoroughfares. Roadside residents have been harassed by small fires, and a few outbreaks, whipped into sizable flames by gusty winds, raced through mountain passes. The largest, near Newhall, burned over 2,000 ac.

Use of the spray containing potassium chlorate was disclosed by the highway department. Roads sprayed with the inflammable mixture include Foothill Blvd. from the Newhall area east through La Crescenta and Montrose; Highway 99 across the Ridge Route and the Coast Highway in the Malibu area.

Officials said the weed-killing compounds would ordinarily have been driven into the soil along shoulders of the roads by rains. Because of dry weather and unseasonal heat, the solution dried on the ground surface and crystals of the chlorate formed, turning the road networks into a tinder box.

The State Highway Department, to reduce the fire danger, has been cutting fire-breaks along roadsides treated with the spray and using the loosened soil to cover the highway shoulders. Substances in the earth have become so inflammable that frictional heat from the road scrapers started small fires.

Bid Opening Soon for New Los Angeles Sewer

COUNTY Sanitation District No. 2 of Los Angeles County, California, has completed plans and bids will probably be opened on Feb. 25 for the construction of Unit 1, Joint Outfall "A" Sewer Extension, from the District Joint Disposal Plant, near Harbor City, to a junction with an existing sewer tunnel at a point approximately two miles southwest of said plant in the vicinity of San Pedro.

The work involves 6,681 lin. ft. of 12-ft. diameter reinforced concrete precast pipe or horseshoe section monolithic conduit sanitary sewer, and 3,419 lin. ft. of 12-ft. diameter horseshoe section reinforced concrete lined tunnel.

Plans and specifications are available from the office of the Chief Engineer of the District.

Repair Work Started on Endangered North Pier of Peace River Bridge

START has been made on a major repair program designed to restore the endangered north pier of the Peace River Bridge, main link of the Alaska Highway, in order that the work will be completed prior to the heavy spring runoff. The bridge which is 2,130 ft. long with a 930-ft. center span, crosses the Peace River between Dawson Creek and Fort St. John, B. C.

During the annual inspection by Army Engineers last summer it was suspected that scouring action of the flowing water was undermining the north pier of the big suspension bridge. Further intensive investigation with the aid of divers revealed that a hole 30 ft. square by eight feet deep had been scoured out underneath the pier.

Because of the importance of the bridge, which was built by the U. S. Public Roads Administration during the war at a cost of approximately $4,000,000, an independent opinion was asked of Dr. P. L. Pratley, noted Canadian consulting engineer. As a result of his report the present repair program has been put into effect. This will base the whole concrete pier solidly on a firm foundation instead of resting on gravel as it now does. Thus, any danger of the pier toppling over, as would happen if the erosion of the foundation continued up to the time of the spring floods, will be averted.

Army engineers have built a temporary bridge from the shore to the weakened pier from which the repair work will be carried out. The next step is to build a steel sheet piling caisson around the pier, which will be pumped dry of water to facilitate installation of the new foundation.

The work is being supervised by Dr. Pratley and the Commander, Northwest Highway System. While work is in progress the bridge will be kept open for normal traffic.

WE REGRET the publication of a serious error in the "Supervising the Jobs" columns for December. In reporting the personnel employed on construction of Big Dry Creek Dam in California, being completed at that time by Earl Parker, contractor of Marysville, Calif., it was erroneously stated that it was a Bureau of Reclamation project. Actually it was constructed for the Corps of Engineers, under the direction of the Sacramento office.

City, State Seek Agreement On Salt Lake Freeway Route

CONSTRUCTION of the $1,200,000 freeway to bypass Salt Lake City will begin June 1 if the City Commission and the Utah State Road Commission can reach an agreement on the route. The four-lane through highway will extend from a point north of Salt Lake City to the Draper cross road. Tentative plans call for the route to pass west of Main St. with access roads to the city facilitating traffic entrance at regular intervals.

According to future plans, the highway will eventually connect Brigham with Nephi as well. The road is designed to include a 20-yr. development period.

A ROAD BUILDING conference, sponsored by the civil engineering department of the University of Washington, will be held in Seattle on Feb. 16-18. Prof. Robert G. Hennes is general chairman for the conference which is expected to attract several hundred road construction engineers from all parts of the state.

PERSONALLY SPEAKING

COL. JACK SINGLETON, chief engineer of the American Institute of Steel Construction, Inc., in New York City, is on a speaking tour which includes the West. He will address various engineering groups in the Bay area, Sacramento and the Northwest following Feb. 15.

Colonel Ralph A. Tudor of San Francisco, former U. S. District Engineer at Portland, Ore., has been named as chief engineer of the newly created division of San Francisco Bay toll crossings of the California Department of Public Works. The new division will have charge of studies and surveys, preparation of plans, specifications, estimates and construction of toll-highway crossings of the Bay. Col. Tudor has appointed as his assistants: **Norman C. Raab,** to be bridge design engineer; **Edwin F. Levy,** office engineer; and **Oliver R. Bosso,** in charge of surveys.

* * *

Colonel Lyle Rosenberg, retired Army engineer of Berkeley, Calif., has accepted the post of city manager of Albuquerque, N. Mex. Rosenberg, a 1919 West Point graduate, commanded a construction brigade overseas during the last war and was discharged in 1946 for physical disability. He was U. S. Army district engineer in Albuquerque in 1942.

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Edgar R. Herzog has been retained as planning officer for the King County (Seattle, Wash.) Planning Commission. Formerly associated with Victor N. Jones, Seattle architect, and the real estate office of the Federal Public Housing Authority, Herzog's first project for the commission will be preparation of an overall map of the county for designation of zoning areas.

* * *

C. E. Arnold has taken over duties as County Engineer and Surveyor of Los Angeles County, Calif., upon the retirement of **Alfred Jones.** Arnold has been with the County Surveyor's Office since 1924, and was appointed Chief Deputy Surveyor in 1935, the position he held continuously until the present appointment. He will be assisted by **Robert L. Gregory,** who has a degree in Civil Engineering from the University of Kentucky, and by **Frank W. Pore,** civil engineering graduate of Purdue University.

J. B. WARRACK, first president of the Seattle Chapter of Associated General Contractors 25 years ago, has again been elected to that post for 1948, the 25th year of the chapter's existence.

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Ivan Bloch, for the past six months Industrial Consultant to the Department of Interior's Pacific Northwest Coordination Committee, has resigned from the staff of the Bonneville Power Administration. The former chief of the Division of Industrial and Resources Development for the Administration will enter private practice as an industrial engineering consultant with headquarters in Portland, Ore.

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L. D. Mars, resident engineer for the Oregon State Highway Commission at Astoria for the past 9 yr., has moved his headquarters to Nehalem and will supervise work both there and at Astoria.

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G. G. Paine, city engineer, and **H. A. Lande,** street superintendent for Everett, Wash., have been reappointed to their respective posts by members of the city commission. **Louis H. Unzelman** is commissioner of public works.

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J. H. Scott, resident engineer for the Oregon State Highway Commission at Nehalem, retired from active service on Jan. 1, after 31 yr. of service with the state highway department.

* * *

George Langsner has been designated head of the newly created Utilities Section established for District VII of the California Division of Highways covering Los Angeles, Orange and Ventura Counties. The Utilities Section will handle all matters concerning planning and construction

BUREAU OF RECLAMATION engineers who have recently taken over new and responsible positions for the South Platte River District, Region 7, an area comprising the South Platte River watershed from the Continental Divide to Paxton, Neb. EVERETT S. HUNTINGTON, upper left, leaves the Chief Engineer's Office to become manager of the District with headquarters in Denver. JAMES H. KNIGHTS, right, former project manager for the Blue-South Platte project, has been promoted to District Engineer. EMIL V. LINDSETH, lower left, chief of the marketing and sales division of the regional office, has been named Power Manager of the District. CHARLES P. SEGER, right, formerly of McAllen, Tex., has been designated construction engineer for the Narrows Dam at Fort Morgan, Colo.

phases, except issuance of encroachment permits. Need for the division was felt because of the greatly increased State highway construction program in the counties.

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J. H. Blake, marine and structural engineer with the forestry department of the provincial government of Canada has been superannuated after 26 years' service. He is widely known in engineering, construction and lumber trade circles in British Columbia.

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Lieutenant General Raymond A. Wheeler, Army Chief of Engineers, and **William A. Durkin,** president of the Walsh Construction Co., of New York, San Francisco and other cities, have been designated by The Moles, New York society of tunnel and heavy construction men, as winners of its two (member and non-member) annual awards "for outstanding contributions to construction progress." Gen. Wheeler was appointed Chief of Engineers by President Truman immediately after V-J Day. In this capacity, he is in charge of the largest peace-time federal construction program in the nation's history. Durkin, a native of

WHEELER **DURKIN**

Indiana, climbed through a gamut of subsidiary positions to become president of the Walsh Co. Outstanding projects built by the Walsh organization include the four 33-ft. diameter diversion tunnels for Fort Peck Dam in Montana, the first section of Grand Coulee Dam on the Columbia River in Washington (jointly with other contractors), three tunnels for Southern California's Colorado River Aqueduct, and the Cresta hydro-electric tunnel for the Pacific Gas & Electric Co.

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The Thomas Fitch Rowland prize of the American Society of Civil Engineers has been awarded to **Robert F. Blanks,** with the Bureau of Reclamation at Denver, Colo.

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Brig. Gen. Thomas M. Robins (Ret.), Portland, has been retained by the Rogue Valley Irrigation Association to serve as a consultant. He will prepare material for presentation at a hearing on the Corps of Engineers' proposed reclamation program for the Rogue River basin in southern Oregon.

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Charles McCall, formerly city manager of Salinas, Calif., has been selected as city manager of Glendale, Calif.

* * *

George W. Haggard, general manager of the Texas Power Reserve Electric Cooperative, Inc., is the new Assistant Administrator for the Rural Electrification Administration. As manager of the Power Reserve, a federation of the 100 REA-financed cooperatives in Texas, Haggard

KARL O. KOHLER

gained an intimate knowledge of REA administration techniques. He succeeds **Carl Hamilton,** who resigned to return to Iowa where he will engage in newspaper work.

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William Hilde, president and majority owner of the H & R Construction Co., Inc., Great Falls, Mont., has announced a change in the corporate name to HGR Construction Co., Inc.

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Karl O. Kohler, head of the regional staff of the Soil Conservation Service at Portland, Ore., has been appointed to a three months' agricultural mission to Siam by the food and agricultural organization of the United Nations. **Dr. R. H. Walker,** dean of the agricultural experiment station at Logan, Utah, is also participating in the mission, which is already in Siam.

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A. H. Anderson, resident engineer on a bulkhead construction project for the Everett, Wash., port commission, has been appointed assistant manager of the port organization. The post of port engineer, held for many years by **Duncan McCormick,** has been discontinued.

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James E. Parker has been appointed road district supervisor for Grays Harbor County at Aberdeen, Wash. Parker succeeds **George Wickman** who has resigned after many years of service with the road district.

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Walter Weir, drainage engineer at the University of California College of Agriculture, has been made a life member of the American Society of Civil Engineers. The award, made only after completion of 35 years of continuous membership, was announced at a meeting of the San Francisco section of the society.

* * *

George E. Lang, formerly division engineer at Tucson for the Arizona State Highway Department, is now district engineer at Flagstaff.

SUPERVISING THE JOBS

H. K. Siron is general superintendent for Edward R. Siple Co., Los Angeles, on the construction of one of the world's largest filling stations at Crenshaw Center in Los Angeles, for the General Petroleum Co. Other key men in the Siple organization are **Carl Hoeme,** office manager, **B. W. Tubbs,** labor foreman and **Ray Bailey,** cement foreman. About 150,000 sq. ft. of paved surface are included. Steyer-Wisebrod, Inc. is the steel sub-contractor, and **Charles Zickau** is steel foreman.

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John Powers is superintendent for the Del R. Beebe Construction Co., Fallon, Nev., on construction of the roads and underground utilities at McNary Dam near McNary, Ore., under a $417,000 contract. **Glen Dusky** is the rock plant superintendent, **Art Corliss** is carpenter superintendent, **Howard Hunt** is job superintendent. **H. E. Reynolds** is equipment foreman and **H. R. Kelly** is carpenter foreman.

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Andy Moe is superintendent for the Wm. Simpson Construction Co. of Los Angeles, Calif., on the extension of telephone facilities along Green St. in Pasadena, Calif. Carpenter foremen on the $750,000 job are **Lear Parker** and **John Wallen. Robert Swaithes** is labor foreman and **Jack Rotsford** is office manager for the contractor. Superintendent for Fishback & Moore of California, Inc., Los Angeles, electrical contractors, is **Leon Romberger.**

* * *

Carl D. Edwards is superintendent and **Joseph Spurgeon** is project manager for contractor Truman Browne, owner and builder, on construction of a new housing project to consist of 78 apartments at Del Amo Gardens in Long Beach, Calif. **Ed Pepper, W. B. Elam** and **P. G. Carpenter** are carpenter foremen. **L. F. McGillis** and **M. Campbell** are the labor foremen.

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L. H. Moon is in charge of construction for O. D. Williams, Jr., contractor of Bakersfield, Calif., on two buildings in that city for the Pacific Tel. & Tel. Co. The first building was completed last November and the second will be finished about May. **Don O. Compton** is general foreman for the contractor.

* * *

Jack Wheat is supervising levee construction on the Yakima River south of Yakima, Wash., for J. A. Terteling & Sons, Boise. The work is a flood control project of the Corps of Engineers. During Novem-

ber a 70-ft. coyote hole with two 30-ft. tributary drifts was shot to provide riprap for the levees. An estimated 20,000 tons of rock was loosened by the shot of 5,500 lb. of powder. **Cy Anderson** is powder foreman on the job.

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Henry Johnson is the project manager and **John Brust** is general foreman for Peter Kiewit Sons' Co., Omaha, Neb., and Morrison-Knudsen Co., Inc., Boise, Idaho, who have the $6,796,213 contract from the Corps of Engineers for the construction of stage 2 of Riverdale, Garrison Dam construction town. The work calls for the erection of 250 family dwelling units and 24 large buildings.

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H. C. Studer, recently superintendent for Peter Kiewit Sons' Co. on the Malibu Beach Highway relocation, is now that company's general superintendent on construction of Hollywood Freeway, between Barham Blvd. and Vineland Ave., Los Angeles. Assisting him are **C. A. McMahon,** structure superintendent, **John Davis,** utility superintendent, and **Bill Collings,** job engineer. Foremen on the project include **Fred Welch,** grading, **Fred Jackson** and **"Tiny" Madison,** labor, **Glen Guy** and **Bert DeMay,** carpenter, and **Ray Brigance,** piledriver. **Glen Kelly** is master mechanic.

* * *

John Burford is general superintendent for E. A. Kaiser Co., Beverly Hills, Calif., on construction of a gymnasium for the school district at Burbank, Calif. General carpenter foreman is **Ralph Bowman,** and carpenter foremen are **T. G. Todd** and **Frank Byars. Roe Wilson** is labor foreman. Electrical sub-contractor is the Draucker Electric Co. of Los Angeles and their job superintendent is **Ralph Valore.** Steel is being furnished by the Blue Diamond Corporation, represented by **J. L. Crain,** superintendent, **K. W. Jensen,** foreman and **J. Krosky,** general superintendent.

* * *

Cecil L. Turner is superintendent for the Griffith Co., Los Angeles, Calif., on their job of paving Daly St. in Los Angeles. Foremen on the project are **John Strange** and **J. F. Huber. Walt Dill** is the carpenter foreman. **Al Beeman** is resident engineer for the City of Los Angeles.

* * *

Kenneth Mann is superintendent for Peter Kiewit Sons' Co., Omaha, Neb., on gravel surfacing work at Fort Collins, Colo., and the grading and gravel surfacing work at Ault, Colo., under Colorado Highway Department contracts.

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P. I. Reid is superintending construction of the $2,103,699 hospital addition for the Veteran's Administration located four mi. south of Livermore in Alameda County, Calif., for Del E. Webb Construction Co. of Los Angeles, Calif. **Travis Williams** is the general foreman, and **F. W. Danielson** is job engineer. **I. A. Mabey** is office manager. The 119-bed tuberculosis hospital building will be of reinforced concrete construction.

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Emil Erlandson is superintending erection of the million-dollar professional building going up at 960 East Green St. in Pasadena, Calif., for contractors McNeil Construction Co. of Los Angeles. **Ernie M. Johnson** is carpenter foreman, and **G. G. "Tex" Murray** is the labor foreman. Engineer on the project is **C. W. Houston,** and **L. E. Orrick** is the office manager.

TED SCHWARTZ

Ted Schwartz is job superintendent for Joe Chevreaux of Auburn, Calif., contractor for construction of the 1.5-mi. pioneer road to the job and of the sluiceway and alterations to the Cherry Diversion Dam in Tuolumne County, Calif. **E. H. Thompson** is the gunite foreman, and **L. J. Allen** is the heavy duty mechanic. **C. B. Taylor** is purchasing agent for the contractor. Personnel for the City of San Francisco on this improvement of the city's Hetch Hetchy water supply system are engineers **William Helbush** and **Harry Lloyd** and field engineer **Mr. Wallace. James Mitchell** is the early intake superintendent and **Harold Eaton** is inspector.

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C. R. Page is supervising construction of school buildings at Luther Burbank Junior High School in Burbank, Calif., for Baruch Corporation, the contractor. Assisting him are, **Jack Covert** and **G. O. Covert,** carpenter foremen, **Jim Crothers,** labor foreman, and **Carl Fritch,** office manager. **Percy G. Anderson** is resident engineer for the School District.

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A. J. Chenoweth, general superintendent for Peabody & Co., building contractors of Seattle, is supervising the construction of a 52-unit rental housing project in Wenatchee, Wash. Work began on the $326,000 Park Circle project the last week in December and will continue through the summer and spring.

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Asa F. Miller is superintendent for the Edward R. Siple Co., Los Angeles, Calif., on erection of the "Shopping Bag" Store at 1400 N. Peck Rd. in El Monte, Calif.

* * *

Donald L. Robinson, superintendent for the Jones & Laughlin Supply Co., Tulsa, Okla., is supervising the construction of an oil refinery being built for the Continental Oil Co. at Billings, Mont. Preliminary buildings, railroad spur, and site roads are being constructed this winter, but work on the refinery itself will not begin until spring. Completion is scheduled for the late summer of 1949.

* * *

Tony Callabrese, superintendent for Fiorito Brothers, Seattle, is in charge of the $500,000 Toppenish Track road construction project southeast of Yakima, Wash. The project includes grading, surfacing, and bridge construction.

Ralph Hawkins is project manager for Guy F. Atkinson Co. in charge of diversion tunnel construction at Hungry Horse dam site on the Flathead River northeast of Kalispell, Mont. **Carl Nelson** is tunnel superintendent, **Carl Walter,** safety engineer, **C. F. Ewing,** purchasing agent, and **J. A. Grant,** accountant. Excavation began at the outlet portal in November, and underground work in December. Completion is scheduled for the summer of this year. The tunnel will have a 36-ft. diameter and 1,000 ft. length. Atkinson's bid to the Bureau of Reclamation was $643,000.

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Stanley N. Colquitt is general superintendent for the Baruch Corp., Los Angeles, on construction of a group of fourteen stores in the 3900 block on Crenshaw Blvd. in Los Angeles. **Water Eason** is general foreman, **Herbert Woodward** is carpenter foreman and **Joe Swartz** is labor foreman on the contract. **Kenneth Heath** is timekeeper on the job. The structure measures 450 x 150 ft. and is 1- and 2-story reinforced concrete in design.

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Kermit Galbreath is superintending gravel surfacing work on the access road to the Moorhead Dam site near Recluse, Wyoming. Peter Kiewit Sons' Co. have the contract from the Bureau of Reclamation for the project.

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Kenneth Lynch is superintendent for Peter Kiewit Sons' Co., Omaha, Neb., on their contract from the Washington State Highway Department for construction of culverts and railroad at Longview, Wash.

* * *

Carl W. Erickson will personally supervise construction of the 4-mi. highway realignment project just southeast of Trinidad, Wash., on U. S. No. 10 in Grant County. Contract on the $329,566 job was awarded two months ago to the Erickson Paving Co., Seattle. **W. C. Sloan,** Wenatchee, has been assigned to the project as resident engineer by the Washington State Highway Department.

* * *

H. L. Boswell, general superintendent for L. E. Dixon on construction of an office building for Mullen & Bluett in Los Angeles, is being assisted on the project by **H. O. Jenkins,** general foreman, **Pete Schwartz,** office manager, and **Joe Hernandez,** labor foreman. **Ambrose Wall** is the architect's representative.

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Bill Gonyo is superintendent for Calowell Construction Co. of Long Beach, Calif., on their Matilija Road relocation job in Ventura County, Calif. **George Miller** is general foreman and **Rudy Becker** is master mechanic.

* * *

Al McIntyre is supervising the construction of a mile of the Kibbee Canyon road just north of Monarch in southeast Cascade County, Montana. The job is under contract to S. Birch & Sons, Great Falls. It is expected to be completed in August.

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Fred Wunderlich is project superintendent and engineer for Guy F. Atkinson Co., Long Beach, Calif., on construction of the Alvarado St. Undercrossing in Los Angeles. **Walt Schenk** is carpenter foreman on the job and **Frank Nugent** is labor foreman. **Cecil Cole** is the office manger.

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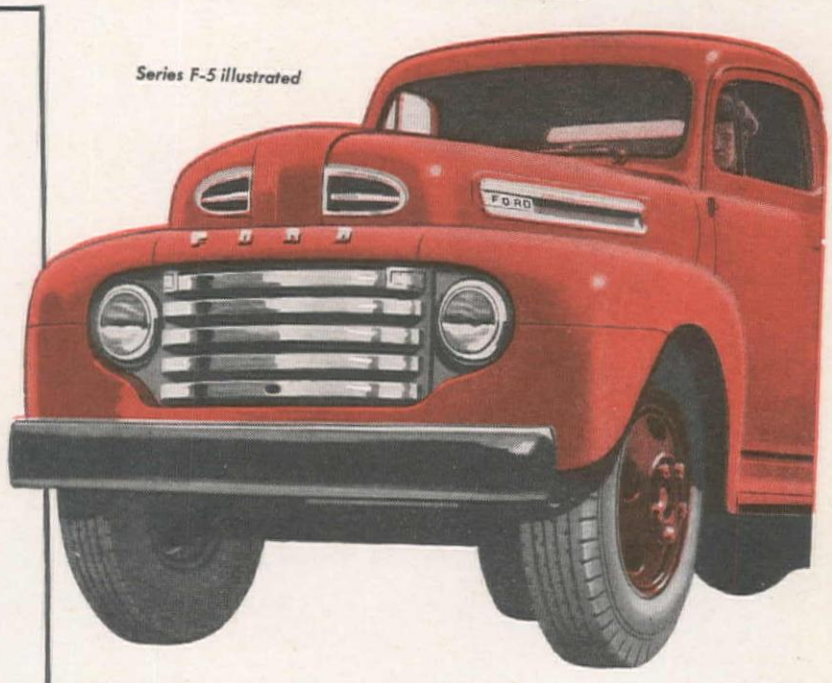
- ★ ***NEW*** 5-speed transmission; overdrive-type available in F-8, standard in F-7.
- ★ ***NEW*** heavy duty Quadrax rear axles. Hypoid-type in F-7, two-speed-type in F-8.
- ★ ***NEW*** Feather-Foot vacuum-actuated truck brakes. 16-in. by 5-in. double cylinder rear brakes in F-8, 16¼-in. by 3½-in. double action rear brakes in F-7.
- ★ ***NEW*** roller action steering! 3-tooth roller supported by two rows of needle bearings. Free-moving steering worm rides on two sets of roller bearings.

You'll find these and scores of other outstanding features in the brand new Ford BIG JOBS for '48! They're Bonus Built for wider use, longer life!

Listen to the Ford Theater over NBC stations Sunday afternoons 5:00 to 6:00 p. m., Eastern Standard Time.

Series F-5 illustrated



Bonus* Built — THE AMAZING RESULT OF AN ENGINEERING PRINCIPLE THAT ASSURES WIDER USE, LONGER LIFE . . . and ONLY Ford Trucks have it!

Every one of the new Ford Trucks for '48 is Bonus Built . . . built with *extra strength* in every vital part. This extra strength provides WORK RESERVES that pay off for you in two important ways:

- **FIRST, these WORK RESERVES give Ford Trucks a *greater range of use* by permitting them to handle loads beyond the normal call of duty. Ford Trucks are not limited to doing one single, specific job!**
- **SECOND, those same WORK RESERVES permit Ford Trucks to relax on the job . . . to do their jobs easier, with less strain and less wear. Thus, Ford Trucks *last longer* because they work *easier!***

Yes, Ford Trucks are Bonus Built . . . built stronger to last longer! That's why they give their owners wider use and longer life! That's why there are more Ford Trucks in use today than any other make!

BONUS: *"Something given in addition to what is usual or strictly due."
—Webster's Dictionary

THEY'RE here . . . they're revolutionary! The finest line of trucks in Ford history!

More than 139 chassis-body combinations! Three new engines! New Million Dollar Cab! New frames, axles, brakes, steering!

See the new Ford Bonus Built Trucks now. You'll find the *right* truck for your needs in the new Ford line.

LIFE INSURANCE EXPERTS PROVE . . . FORD TRUCKS LAST UP TO 19.6% LONGER!

LORAIN

Selection Unlimited

LORAIN Thew TL-20 Lorain SERIES

50 possible combinations! In the 1/2 yd. class, the TL-20 series offers 5 interchangeable booms available on 10 different mountings (crawler, 3 Moto-Cranes, 3 Self-Propelled, 3 Dual-Control).

LORAIN 41 SERIES

PLAN TODAY FOR TOMORROW WITH MULTI-PURPOSE LORAINS

A Lorain is good assurance of profitable performance today — but if the future brings new jobs, new conditions, your Lorain is good future protection. Lorains are no "single-purpose" machines, designed for one kind of work only — instead they're "quick change" artists in adapting themselves to different booms and mountings to conquer new job requirements. . . . No other machines can be adapted to as many different kinds of jobs as multi-purpose Lorains . . . Be wise, select Lorains, for today and tomorrow!

SEE YOUR

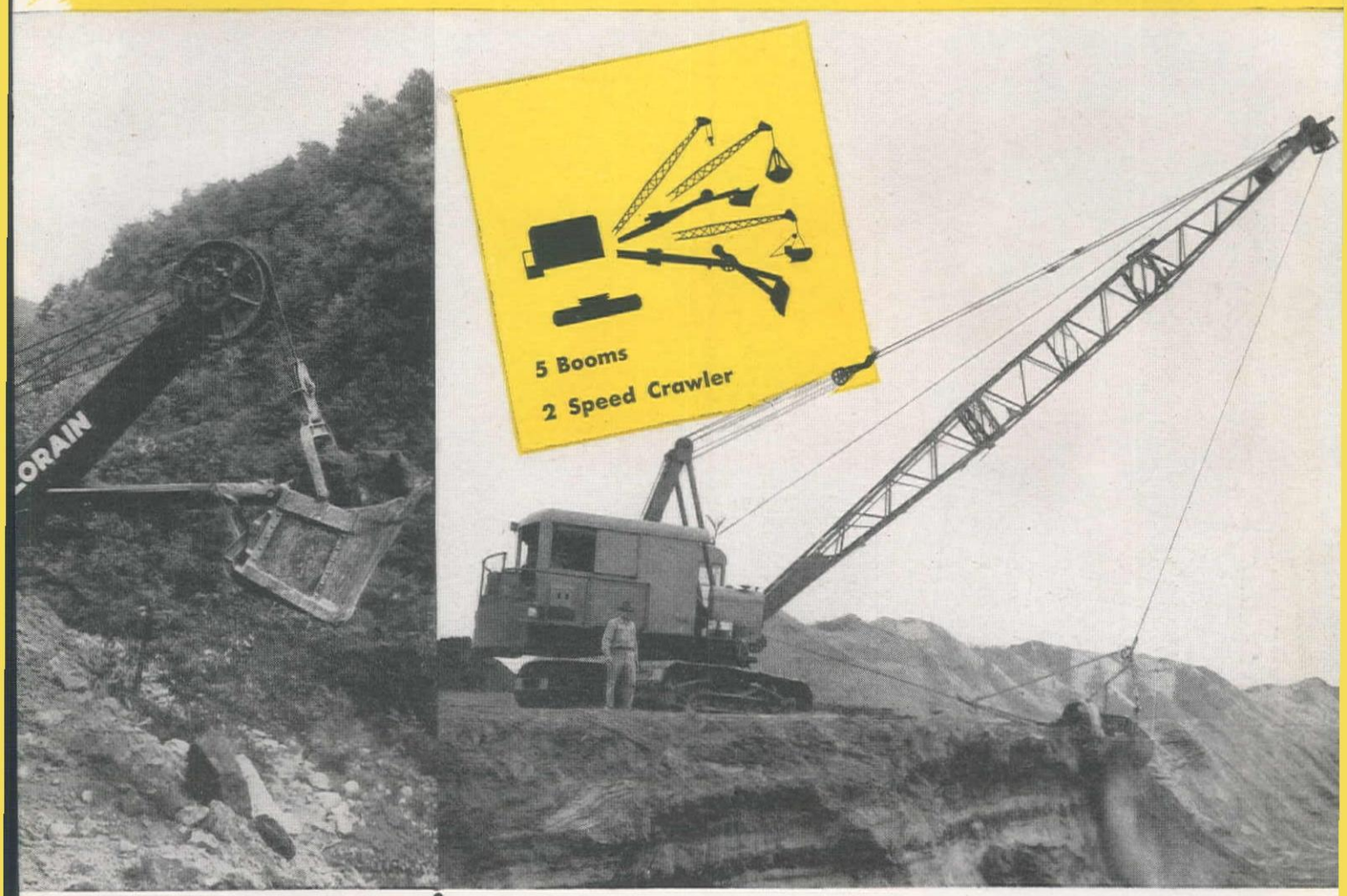
The Thew Shovel Company, Lorain, Ohio

CHOOSE FROM 75 LORAIN PROFIT-MAKERS

All jobs are not the same; they vary in conditions, size, material, ground or travel conditions. This means it's important to your profits to have the right machine in the right place. That's why Lorain offers you this extensive array of equipment — in sizes and capacities; in interchangeable shovel, crane, clamshell, dragline, hoe booms; in crawler and many types of single and 2-engine rubber-tire mountings.

From the total of 75 possible Lorain combinations you are certain to find the right machines to match your job conditions.

And whether you use Lorains singly, or in work teams of several sizes and types, all Lorains are the same in this very important respect . . . Lorains will out-perform usual standards, will handle more material faster, at lower costs. Your Thew-Lorain Distributor will welcome an opportunity to show you how.



In this 3/4 yd. class, any of 5 interchangeable booms may be used on any of 4 different mountings (crawler, 2 Moto-Cranes, Self-Propelled) — a total of 20 combinations.

LORAIN 820 SERIES

The heavy-duty Lorain-820 Series offers units in the 2 yd. class, on 2-speed crawlers. Choice of 5 interchangeable booms including Hoe with controlled tilting dipper.

THEW LORAIN DEALER®

ANDREWS EQUIPMENT SERVICE OF WASHINGTON, INC. ..... *Spokane, Wash.*
BUNTING TRACTOR CO., Inc. *Boise, Twin Falls, Gooding, Fairfield, Burley, Carey, Idaho LaGrande Oregon*
CATE EQUIPMENT CO., *Salt Lake City 4, Utah*
CENTRAL MACHINERY CO. . . . *Great Falls and Havre, Mont.*
COAST EQUIPMENT CO. ..... *San Francisco 3, California*
A. H. COX & COMPANY ..... *Seattle 4, Wash.*
P. L. CROOKS & CO., INC., *Portland 10, Ore.*
LE ROI-RIX MACHINERY CO., *Los Angeles 11*
LIBERTY TRUCKS & PARTS CO. . . *Denver 1*
MOUNTAIN TRACTOR CO. ..... *Missoula and Kalispell, Mont.*
LEE REDMAN EQUIPMENT CO. ..... *Phoenix, Arizona*
SANFORD TRACTOR & EQUIPMENT CO. *Reno, Nevada*
SOUTHERN IDAHO EQUIPMENT CO. *Idaho Falls, Idaho*
TRACTOR & EQUIPMENT CO., *Sidney, Mont. Branch: Miles City Equip.Co., Miles City, Mont.*
WORTHAM MACHINERY CO. ..... *Cheyenne, Wyo. and Billings, Mont. Branches: Sheridan, Greybull, Casper and Rock Springs, Wyo.*

UNIT BID SUMMARY

Highway and Street . . .

New Mexico—Bernalillo County—State—Grade and Surface

W. T. Bookout Construction Co., Las Vegas, was awarded a $754,288 contract by the State Highway Department of Santa Fe, for the construction of Federal Aid Project No. FI-151(6), located on U. S. Hwy. Rt. No. 66, betw. Albuquerque and Moriarty. The approximate length is 6.5 mi. The proposed construction consists of grading, minor drainage structures, four multiple concrete box culverts each over 20 ft. clear span, watering and rolling, leveling course, ballast, bitum. top course surfacing, sealing with asphalt and stone chips, and miscellaneous construction. 400 weather working days are allowed for completion. Unit bids are as follows:

(1) W. T. Bookout Construction Co. $754,288
(2) Skousen Construction Co. 768,000
(3) Brown Contracting Co. 794,743
(4) Allison & Armstrong 868,871
(5) Lowdermilk Bros. ..... $ 869,735
(6) Bowen & McLaughlin 938,247
(7) Peter Kiewit Sons Co. 1,150,103
(8) F. D. Shufflebarger 1,158,938

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lump sum,	removal of old struct.	$1,250	$2,500	$2,400	$4,000	$3,000	$3,000	$5,000
Lump sum,	removal of obstructions	100.00	200.00	100.00	300.00	150.00	100.00	$1,600
464,700	cu. yd. excav., unclassified	.68	.67	.80	.80	.78	.83	1.16
6,200	cu. yd. excav. for structs	2.00	2.50	2.00	3.60	2.50	5.00	4.00
825	cu. yd. excav. for pipe culverts	2.00	2.50	2.00	3.75	2.00	3.00	4.00
1,087,800	sta. yd. overhaul	.015	.03	.025	.02	.01	.02	.02
47,600	¼ mi. yd. haul	.10	.07	.08	.08	.07	.05	.07
1,040	hr. mechanical tamping	4.00	5.00	4.00	5.00	4.00	4.00	6.00
6,600	hr. rolling—sheepsfoot roller	3.00	2.00	1.00	3.00	3.25	4.00	4.00
1,020	hr. rolling—steel tired roller	5.00	5.00	4.00	5.50	5.00	3.80	7.00
1,030	hr. rolling—pneumatic tired roller	4.00	2.00	4.00	3.00	4.25	3.80	6.00
2,650	cu. yd. hand laid rock embankment	4.00	2.00	2.00	5.50	6.00	10.00	7.00
96,150	ton ballast	.62	.60	.77	.60	.75	.65	.95
26,665	ton leveling course	.82	1.17	.99	1.00	1.00	1.05	1.10
10,490	M. gal. watering	2.00	1.00	.50	2.00	1.50	2.80	3.50
3,884	cu. yd. Class "AE" concrete	30.00	31.00	30.00	33.50	35.00	40.00	39.00
468,140	lb. reinforcing steel	.09	.085	.075	.105	.10	.11	.12
1,700	lb. struct. steel	.20	.20	.20	.20	.40	.20	.50
84	lin. ft. corr. galv. metal culv. pipe 10 ga. bevel 72-in. diam.	18.00	20.00	17.00	21.30	24.00	21.00	26.00
184	lin. ft. corr. galv. metal culv. pipe 8 ga. bevel 72-in. diam.	20.00	23.00	20.00	24.00	27.50	22.50	30.00
41	cu. yd. grouted riprap, Class "A"	20.00	10.00	20.00	20.00	30.00	15.00	12.00
2	ea. monuments and markers	50.00	50.00	50.00	50.00	50.00	50.00	60.00
66,000	lin. ft. galvanized barbed wire fence	.15	.25	.15	.20	.21	.16	.18
9	ea. gates, Texas type	10.00	10.00	10.00	9.00	15.00	8.00	11.00
123	ea. bracing	4.00	5.00	3.00	3.60	4.00	5.00	5.00
393	ea. treated timber warning posts (refl.)	7.00	10.00	8.00	10.00	7.50	8.00	8.00
60	ea. right-of-way markers	6.00	6.00	6.00	7.00	10.00	7.50	8.00
0.4	mi. obliterating old road	$1,000	100.00	200.00	250.00	500.00	200.00	500.00
8,200	lin. ft. contour ditches	.10	.10	.10	.12	.20	.10	.12
57	cu. yd. rock and wire check dams	12.00	10.00	12.00	18.00	20.00	12.00	12.00
610	bbl. cutback asphalt, Type MC-1	6.50	6.00	6.00	6.75	7.00	5.75	7.50
3,150	bbl. cutback asphalt, Type MC-3	6.50	6.00	6.00	6.75	6.75	5.50	7.50
9,440	ton top course surfacing	.82	1.17	1.00	1.00	1.20	1.05	1.30
6.534	mi. mixing asphalt and aggregate	600.00	$1,000	500.00	600.00	300.00	500.00	850.00
675	bbl. 120-150 asphalt for seal coat	6.50	7.00	6.00	7.00	7.00	5.75	7.50
1,180	ton aggregate—seal coat	5.00	5.00	4.00	3.75	5.00	5.00	6.00
990	lin. ft. corr. galv. metal culv. pipe, 24-in.	4.00	3.50	3.50	4.20	4.50	4.00	4.50
580	lin. ft. corr. galv. metal culv. pipe, 30-in.	4.80	4.35	4.25	5.20	6.25	5.00	5.50
166	lin. ft. corr. galv. metal culv. pipe, 12 ga. 30-in. diam.	5.95	6.00	5.50	6.60	7.75	6.50	7.00
340	lin. ft. corr. galv. metal culv. pipe, 36-in.	7.25	7.00	6.50	7.80	8.50	8.00	8.00
246	lin. ft. corr. galv. metal culv. pipe, 42-in.	7.75	8.00	8.00	8.10	11.00	9.00	10.00
476	lin. ft. corr. galv. metal culv. pipe, 48-in.	8.90	9.50	9.00	10.70	12.50	10.00	11.00
68	lin. ft. corr. galv. metal culv. pipe, 54-in.	10.00	11.00	12.00	12.35	15.00	13.00	13.00
584	lin. ft. corr. galv. metal culv. pipe, 10 ga. 60-in. diam.	13.45	15.00	14.00	17.00	19.50	17.00	20.00
232	lin. ft. corr. galv. metal culv. pipe, 8 ga. 60-in. diam.	16.00	18.00	16.00	20.00	22.00	20.00	22.00

California—Shasta County—State—Grade and Surf.

Fredrickson Bros., Emeryville, presented the low bid of $625,426 before the Division of Highways, Sacramento, for the road construction from the junction of Route 3 in Redding about 1.5 mi. east. The road will be graded, surfaced with plantmix surfacing on crusher run base, and the superstructure for a structural steel girder bridge with reinforced concrete deck will be constructed. Unit bids were as follows:

(A) Fredrickson Bros. $625,426
(B) Gragline Rentals Co. 666,480
(C) J. H. Pomeroy & Co., Inc. 670,766
(D) S. J. Amoroso Construction Co. and R. A. Farish 702,715
(E) James I. Barnes Construction Co. $715,000
(F) A. Teichert & Sons, Inc. 731,957
(G) Fredrickson & Watson Construction Co. 746,266
(H) George Pollock Co. (a corporation) .. 757,478

(1) 110 cu. yd. removing concrete.
(2) 8 ac. clearing and grubbing.
(3) 21,000 cu. yd. roadway excavation.
(4) 1,250 cu. yd. structure excavation.
(5) 168,000 tons imported borrow.
(6) 1,050 cu. yd. imported top soil.
(7) Lump sum, dev. wat. sup. & furn. wat. equip.
(8) 2,350 M. gal. applying water.
(9) 69 sta. finishing roadway.
(10) 8,525 ton crusher run base.
(11) 5,700 ton mineral agg. (P.M.S.)
(12) 290 ton paving asph. (P.M.S.)
(13) 88 lin. ft. raised bars.
(14) 40 ton liquid asph., SC-2 (prime coat)
(15) 25 ton liquid asph., RORC-5 (seal coat)
(16) 4 ton asph. emulsion (seal coat)
(17) 300 ton screenings (seal coat)
(18) 1,915 cu. yd. Class "A" P.C.C. (structs.)
(19) 331,750 lb. furn. bar reinf. steel.
(20) 331,750 lb. placing bar reinf. steel.
(21) 1,824,000 lb. furn. struct. steel.
(22) 1,824,000 lb. erect struct. steel.
(23) 2,102 lin. ft. steel railing
(24) 280 cu. yd. sacked conc. riprap.
(25) 385 cu. yd. Class "B" P.C.C. (curbs and gutters).
(26) 35 cu. yd. Class "B" P.C.C. (sidewalks)
(27) 22 ea. monuments.
(28) 54 lin. ft. timber railing.
(29) 39 ea. culvert markers and guide posts.
(30) 144 lin. ft. 12-in. R.C.P.
(31) 321 lin. ft. 18-in. R.C.P.
(32) 90 lin. ft. 30-in. R.C.P.
(33) 66 lin. ft. 12-in. C.M.P. (16 gauge)
(34) 68 lin. ft. 72-in. C.M.P. (10 gauge)
(35) 9 ea. spillway assemblies.
(36) 156 lin. ft. 8-in. C.M.P. down drains (16 ga.)
(37) 182 lin. ft. salv. existing pipe culverts.
(38) 78 lin. ft. relaying salvaged C.M.P.
(39) 1 ea. resetting drop inlet.
(40) 1 ea. adjusting manhole to grade.
(41) 7 ea. frames and grates for drop inlets.
(42) 2 ea. manhole frames and covers.
(43) 25 ea. ruby reflectors.
(44) 630 sq. yd. flexible rock-filled mattress.

(Continued on next page)

"We replaced our obsolete equipment without tying up working capital . . . . .

Thanks to this C.I.T. check"

MR. CONTRACTOR: When you need new machinery and equipment, let C.I.T. FURNISH THE NECESSARY FUNDS. You can borrow large or small amounts, at reasonable cost, and spread repayment over many months.

The right equipment, on hand when you need it, can be the means of earning larger profits for you. Don't let the lack of ready cash deprive you of owning any equipment needed to handle your construction jobs economically and with greater efficiency.

When buying equipment, you need make only a moderate initial investment. Use a C.I.T. check to take care of the unpaid balance . . . our funds are available promptly, anywhere, anytime. Amortize the cost by monthly payments arranged to suit your needs.

Any of these C.I.T. offices will furnish rates, terms and full information. They will help you arrange every detail, and their friendly services are available upon request.

Send for NEW booklet on Equipment Financing

CIT "The mark of leadership"

C. I. T. CORPORATION

Industrial and Equipment Financing

One Park Avenue	One N. La Salle St.	66 Luckie Street, N. W.	660 Market St.	416 W. 8th Street
NEW YORK	CHICAGO	ATLANTA	SAN FRANCISCO	LOS ANGELES

AFFILIATED WITH COMMERCIAL INVESTMENT TRUST INCORPORATED

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
(1)	3.65	10.00	8.00	6.90	10.00	6.00	8.00	10.00
(2)	240.00	150.00	300.00	300.00	150.00	400.00	400.00	200.00
(3)	.40	.60	.65	1.00	.75	.90	.53	1.40
(4)	2.40	3.00	5.00	4.00	4.00	4.00	3.50	7.00
(5)	.53	.70	.60	.71	.90	.70	.94	1.00
(6)	3.00	3.00	2.00	4.00	3.00	2.00	3.50	4.00
(7)	$2,400	$2,000	$2,000	$1,500	$1,943	700.00	$2,900	$7,000
(8)	1.45	2.00	2.00	1.00	2.00	2.00	1.50	2.50
(9)	16.00	20.00	20.00	10.00	25.00	30.00	40.00	45.00
(10)	3.48	3.30	3.00	3.25	3.50	4.45	4.10	4.00
(11)	4.40	4.50	4.00	4.50	4.50	6.00	4.75	6.00
(12)	21.00	25.00	22.00	20.00	30.00	22.00	22.70	30.00
(13)	1.20	2.00	1.00	2.00	2.00	2.00	1.50	2.00
(14)	26.50	30.00	30.00	30.00	30.00	40.00	29.40	30.00
(15)	39.00	35.00	32.00	30.00	35.00	45.00	34.00	35.00
(16)	49.00	75.00	40.00	50.00	75.00	60.00	49.40	50.00
(17)	5.70	7.00	6.00	5.00	7.00	7.50	5.25	8.00
(18)	52.00	46.00	55.00	57.00	50.00	70.00	56.30	60.00
(19)	.065	.065	.06	.072	.07	.06	.07	.07
(20)	.026	.03	.02	.023	.03	.03	.027	.03
(21)	.11	.12	.129	.116	.11	.11	.117	.09
(22)	.035	.0325	.03	.04	.04	.04	.039	.04
(23)	7.80	8.00	7.00	7.65	8.00	7.50	8.00	8.00
(24)	26.40	25.00	30.00	30.00	25.00	33.00	39.00	30.00
(25)	42.00	45.00	43.00	43.00	50.00	46.00	34.00	60.00
(26)	42.00	45.00	40.00	43.00	50.00	40.00	34.00	40.00
(27)	5.40	8.00	6.00	10.00	8.00	5.00	7.00	5.00
(28)	3.00	3.00	5.00	3.00	4.00	4.00	5.00	3.00
(29)	4.80	10.00	5.00	10.00	10.00	5.00	7.60	5.00
(30)	2.78	2.50	2.00	3.00	3.00	2.75	2.60	2.00
(31)	4.15	3.50	4.00	4.00	3.50	4.00	3.70	2.50
(32)	7.60	7.50	8.00	10.00	8.00	9.00	6.50	6.00
(33)	2.14	3.00	2.00	3.00	3.00	2.25	2.15	2.00
(34)	24.00	25.00	30.00	40.00	25.00	26.00	35.00	20.00
(35)	24.00	25.00	40.00	50.00	25.00	40.00	42.00	30.00
(36)	1.60	2.00	2.00	2.00	2.00	1.75	1.72	2.00
(37)	1.80	.70	1.00	2.00	1.00	2.00	1.75	1.50
(38)	1.20	1.10	1.00	1.50	1.00	2.00	1.75	1.50
(39)	72.00	50.00	100.00	50.00	50.00	75.00	100.00	100.00
(40)	42.00	100.00	50.00	25.00	100.00	75.00	90.00	100.00
(41)	78.00	75.00	100.00	100.00	75.00	85.00	100.00	50.00
(42)	62.00	100.00	100.00	50.00	100.00	75.00	70.00	75.00
(43)	1.80	5.00	10.00	3.00	5.00	4.50	6.00	5.00
(44)	9.00	10.00	12.00	10.00	10.00	7.00	14.50	10.00

Washington—Yakima County—State—Pave and Struct.

Fiorito Bros., Seattle, was awarded a $439,025 contract by the Department of Highways at Olympia for 13.1 mi. clearing, grubbing, base and crushed stone surface, and construction of a reinforced concrete bridge on Secondary State Hwy. No. 3-A, between Parker and Toppenish. Units bids were as follows:

(A)	Fiorito Bros.	$439,025	
(B)	Max J. Kuney Co.	467,157	
(C)	Goodfellow Bros., Inc.	490,012	
(D)	Morrison-Knudson Co., Inc.	498,364	
(E)	Peter Kiewit Sons Co.	499,997	
(F)	Lige Dickson Co.	509,012	
(G)	Erickson Paving Co.	509,456	
(H)	White Bros. Co.	$512,414	
(I)	The Harrison Bros. Co.	539,744	
(J)	N. Fiorito Co.	547,964	
(K)	Natt McDougall Co.	548,601	
(L)	J. A. Terteling & Sons, Inc.	565,910	
(M)	Guy F. Atkinson Co.	582,707	

(1) Lump sum, clearing and grubbing.
(2) 22,260 cu. yd. unclassified excav.
(3) 348,020 cu. yd. borrow for rdwy.
(4) 8,335 cu. yd. common trench excav.
(5) 3,750 cu. yd. structure excav.
(6) 430 lin. ft. slope treatment.
(7) 688.8 stas. (100-ft.) finishing roadway.
(8) 60 cu. yd. gravel backfill in place.
(9) 16,600 cu. yd. crushed stone surf. top crse.
(10) 25,970 cu. yd. crushed stone surf. base crse.
(11) 6,550 M. gal. water.
(12) 1,500 cu. yd. crushed stone surf. top crse. in stockpile.
(13) 4,100 cu. yd. crushed cover stone in stkpl.
(14) 2,280 cu. yd. cse. cr. screen, ⅝ to ¼-in. in stockpile.
(15) 670 cu. yd. fine cr. screen, ¼ to 0-in. in stkpl.
(16) 1,060 lin. ft. special conc. curb in place.
(17) 688.7 cu. yd. conc. Class A in place.
(18) 46,000 cu. yd. conc. Class B in place.
(19) 119,090 lb. steel reinf. bars in place.
(20) 50 cu. yd. hand placed riprap.
(21) 116 ea. reinf. conc. right-of-way markers in place.
(22) 2.85 M.B.M. special wood flume.
(23) 0.16 M.B.M. wood diversion box.
(24) 3,327 rods right-of-way fence.
(25) 318 rods remove and reset right-of-way fence.
(26) 6,280 sq. yd. remove exist. bitum. conc. pave.
(27) 324 lin. ft. plain conc. or V.C. sewer pipe, 6-in. diam.
(28) 327 lin. ft. pl. conc. or V.C. pipe 8-in. diam.
(29) 3,561 lin. ft. pl. conc. or V.C. culv. pipe, 12-in. diam.
(30) 5,268 lin. ft. pl. conc. or V.C. culv. pipe 18-in. diam.
(31) 672 lin ft. pl. conc. or V.C. culv. pipe 24-in. diam.
(32) 36 lin. ft. std. reinf. conc. culv. pipe 12-in. diam.
(33) 1,239 lin. ft. std. reinf. conc. culv. pipe 18-in. diam.
(34) 192 lin. ft. std. reinf. conc. culv. pipe 24-in. diam.
(35) 90 lin. ft. std. reinf. conc. culv. pipe 30-in. diam.
(36) 486 lin. ft. std. reinf. conc. culv. pipe 36-in. diam.
(37) 745 cu. yd. struct. excav.
(38) 419 cu. yd. conc., Class A, in place.
(39) 811 cu. yd. conc., Class B, in place.
(40) 113,500 lb. steel reinf. bars in place.
(41) 10,900 lb. struct. steel in place.
(42) 6 ea. bridge drains in place.
(43) 565 lin. ft. beam gd. rail ty. No. 1 des. No. 5.
(44) Lump sum, remove existing struct.

	(A)	(B)	(C)	(D)	(E)	(F)	(H)	(I)	(L)	(M)
(1)	$7,000	$12,000	$5,000	$19,000	$5,500	$9,000	$14,500	$5,000	$9,500	$8,000
(2)	.32	.40	.40	.36	.30	.48	.35	.45	.55	.40
(3)	.32	.40	.40	.39	.44	.48	.43	.45	.47	.50
(4)	.32	.70	.65	.90	.50	.75	1.00	1.50	.40	1.00
(5)	3.00	2.00	4.50	1.50	4.00	1.50	3.50	4.00	2.15	5.00
(6)	.15	.30	.25	.15	.25	.25	.25	.20	.55	.60
(7)	8.00	10.00	10.00	13.00	10.00	12.00	15.00	10.00	11.25	12.00
(8)	3.00	4.00	4.00	4.40	6.00	5.00	3.80	10.00	5.50	5.00
(9)	1.65	2.20	1.90	1.45	1.35	1.75	1.75	1.80	2.00	2.15
(10)	1.65	2.00	1.80	1.45	1.20	1.75	1.55	1.80	2.00	2.00
(11)	1.75	2.00	2.00	2.75	1.50	2.00	2.25	2.50	2.50	3.00
(12)	1.50	1.80	1.40	1.45	1.00	1.15	1.35	1.80	1.75	1.75
(13)	1.50	1.80	1.50	1.45	1.00	2.00	1.75	1.80	1.75	2.20
(14)	1.50	2.20	1.60	1.45	1.45	2.60	2.25	2.50	1.75	2.80
(15)	1.50	1.80	1.30	1.45	1.00	2.40	2.25	2.50	1.75	2.80
(16)	2.00	1.20	1.50	1.60	2.70	2.00	2.50	2.00	1.50	2.00
(17)	62.00	42.00	58.00	67.00	65.00	62.00	56.00	63.00	85.00	62.00
(18)	60.00	56.00	53.00	77.00	80.00	61.00	56.00	58.00	85.00	78.50
(19)	.09	.10	.105	.105	.13	.105	.11	.125	.12	.11
(20)	12.00	10.00	25.00	20.00	10.00	35.00	10.00	10.00	12.00	25.00
(21)	2.50	6.00	4.00	4.00	3.00	4.00	3.50	3.50	6.00	4.50
(22)	200.00	250.00	200.00	250.00	325.00	200.00	250.00	200.00	300.00	250.00
(23)	300.00	250.00	200.00	250.00	325.00	200.00	250.00	500.00	300.00	400.00
(24)	1.35	2.00	1.30	3.10	3.00	2.75	2.50	3.00	2.10	2.70
(25)	.83	2.00	1.30	2.80	3.00	2.75	3.00	3.00	2.10	2.50

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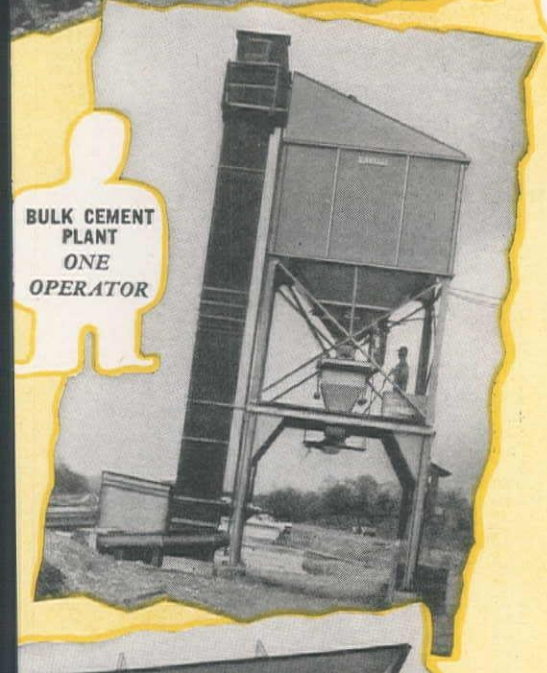
SPREADER AND VIBRATOR
ONE OPERATOR

FINISHING MACHINE
ONE OPERATOR

MAXIMUM PERFORMANCE with MINIMUM CREWS



BULK CEMENT PLANT
ONE OPERATOR

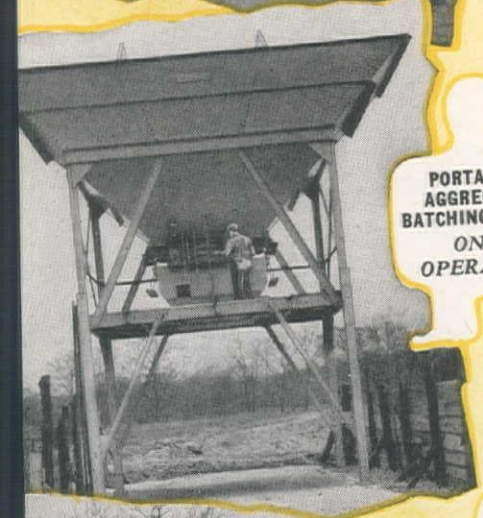
For road and airport paving and for general concrete construction, Blaw-Knox builds machines and equipment requiring only minimum crews to complete a quality construction project in the quickest possible time. *Low cost per yard* tells the story of the contractor's profit.

Look to Blaw-Knox for detailed information and performance data on the time and money saving equipment shown here — and also ask for data on Blaw-Knox Road Forms; Curb and Gutter Forms; Sheepsfoot Rollers; Truck Mixers and Agitators; Truck Turntables; and Steel Forms for General Concrete Construction.

You should have a copy of Bulletin No. 2036. *Send for it.*

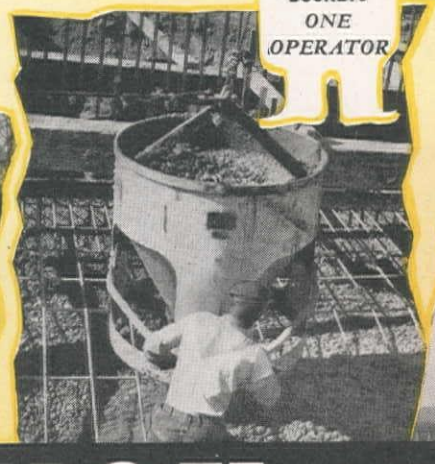
BLAW-KNOX DIVISION of Blaw-Knox Company
2102 Farmers Bank Building, Pittsburgh 22, Pa.

See your Nearest Blaw-Knox Distributor.



PORTABLE AGGREGATE BATCHING PLANT
ONE OPERATOR

PRECISION SUBGRADER
ONE OPERATOR



CONCRETE BUCKETS
ONE OPERATOR

CLAMSHELL BUCKETS
ONE CRANE OPERATOR

BLAW-KNOX CONSTRUCTION EQUIPMENT

(26)	.05	.30	.10	.20	.10	.15	.20	.50	.50	.15
(27)	.75	.80	.70	.80	.65	1.15	1.00	.70	.80	.70
(28)	1.50	1.30	1.00	1.10	.95	1.25	1.20	.85	1.10	1.00
(29)	2.00	1.75	1.50	1.70	1.60	1.50	1.70	1.25	1.90	1.70
(30)	3.00	2.75	2.50	2.90	2.80	2.50	3.10	2.20	3.20	2.70
(31)	4.75	4.10	4.00	4.50	4.40	3.50	4.10	3.80	5.00	4.40
(32)	2.25	2.00	2.00	2.10	2.50	2.00	2.50	1.65	2.35	2.20
(33)	3.50	3.25	3.20	3.55	3.50	3.00	3.50	2.75	4.00	3.40
(34)	5.00	4.50	4.30	4.80	4.75	4.50	4.40	4.00	5.30	4.70
(35)	7.00	6.50	7.00	7.00	7.00	7.50	6.60	5.50	8.25	7.00
(36)	9.50	9.00	10.00	8.90	9.00	9.00	8.50	7.25	10.50	9.00
(37)	10.00	4.00	8.00	1.90	10.00	8.50	9.00	9.00	2.75	15.00
(38)	60.00	45.00	76.00	70.00	72.00	56.00	62.00	81.00	65.00	68.00
(39)	60.00	43.00	76.00	70.00	72.00	55.00	78.00	81.00	65.00	66.00
(40)	.09	.10	.10	.105	.13	.105	.11	.12	.12	.10
(41)	.40	.25	.43	.44	.50	.44	.45	.50	.60	.50
(42)	50.00	80.00	60.00	51.00	65.00	55.00	30.00	75.00	75.00	50.00
(43)	8.00	4.00	6.50	6.95	8.00	2.50	6.00	6.50	12.00	4.20
(44)	$1,500	$3,500	$3,500	$1,850	$2,500	800.00	$2,500	$3,500	$1,500	$7,750

Utah—San Juan County—State—Bitum. Surf.

Strong Co., Springville, was low before the State Road Commission, Salt Lake City, with the bid of $406,196 for 17 miles of 2-in. road mixed bituminous surface on U. S. Highway 160, between Monticello and the Colorado Line. The following unit bids were submitted:

(1) Strong Co., Springville.....$406,196
(2) W. W. Clyde, Springville..... 422,876
(3) R. M. Jensen & A. C. Hunsaker..... 432,136
(4) Parson & Fife & L. T. Johnson..... 432,509
(5) A. O. Thorn & Sons..... 433,698
(6) V. C. Mendenhall Co.....$481,953
(7) Reynolds Constructors 484,660
(8) J. M. Sumsion 491,940
(9) Engineer's Estimate 444,377

	(1)	(2)	(4)	(5)	(7)	(8)	(9)
307,500 gal. bitum. matl., Type SC-3	.13	.125	.13	.14	.14	.16	.125
60,200 gal. bitum. matl., Type RC-4	.16	.17	.16	.17	.16	.17	.15
3,115 ton cover material	3.00	3.00	3.00	3.50	4.00	4.00	3.00
0.324 mil. scarifying & mixing (44-ft. wide)	$1,000	$1,400	800.00	1500.00	$1,600	$1,200	$2,000
16.771 mi. scarifying & mixing (22-ft. wide)	600.00	700.00	650.00	600.00	800.00	800.00	650.00
85,500 ton crushed rk. or cr. grav. surf. course	.95	.98	.95	1.00	1.10	1.00	1.00
72,000 ton gravel or cr. rock base course	.85	.98	.90	.95	1.00	.90	.95
354,000 cu. yd. unclassified excav.	.22	.24	.25	.25	.30	.33	.30
1,270,000 sta. yd. overhaul, Class "A"	.015	.012	.015	.015	.01	.015	.015
11,500 yd. mi. overhaul, Class "B"	.20	.15	.20	.15	.20	.15	.15
6,472 1,000-gal. watering	1.00	2.00	2.50	1.50	2.00	3.00	2.00
5,175 hr. rolling	4.00	4.00	3.75	4.00	5.00	5.00	4.50
1,450 cu. yd. excav. for struct.	3.00	1.50	1.00	1.50	2.00	2.00	1.50
50 cu. yd. channel excav.	1.00	1.50	1.00	1.00	1.00	.75	.40
100 lin. ft. 12-in. C.G.M. pipe	2.35	1.85	2.00	2.00	2.25	1.60	1.60
1,732 lin. ft. 18-in. C.G.M. pipe	2.93	2.75	2.50	2.50	2.50	2.70	2.50
1,448 lin. ft. 24-in. C.G.M. pipe	4.27	4.10	3.80	3.50	4.00	3.60	3.50
164 lin. ft. 30-in. C.G.M. pipe	5.40	5.20	4.50	4.75	5.00	5.00	4.00
168 lin. ft. 36-in. C.G.M. pipe	7.90	8.00	6.35	6.75	8.00	7.00	6.80
98 lin. ft. 48-in. C.G.M. pipe	10.13	11.00	9.50	10.00	11.00	10.00	9.30
172 lin. ft. 96-in. C.G.M. pipe	30.80	34.60	33.25	35.00	33.00	32.00	35.00
108 lin. ft. relaying 18-in. C.G.M. pipe	1.50	1.00	1.50	1.00	2.00	1.50	1.00
138.0 cu. yd. concrete, Class "A"	40.00	50.00	55.00	50.00	50.00	60.00	45.00
70.0 cu. yd. concrete, Class "B"	40.00	50.00	55.00	50.00	60.00	60.00	45.00
25,730 lb. reinforcing steel	.11	.12	.11	.10	.10	.12	.10
3 ea. removal of existing struct.	500.00	300.00	500.00	200.00	500.00	400.00	150.00
82 ea. guide posts	6.00	3.50	3.10	6.00	7.00	6.00	4.00
2,860 lin. ft. guard rail	2.50	2.25	3.50	2.70	3.00	3.00	3.00
585 lin. ft. resetting existing guard rail	1.50	1.00	2.50	1.00	1.25	1.25	1.00
83,000 lin. ft. right of way fence, Type "A"	.20	.16	.21	.20	.30	.24	.15
2,200 lin. ft. right of way fence, Type "B"	.25	.25	.23	.25	.35	.26	.20
17,000 lin. ft. moving exist. right of way fence	.10	.12	.17	.15	.20	.12	.10
50 ea 14-ft. gates	45.00	35.00	30.00	30.00	35.00	32.00	25.00
241 ea. right of way markers	5.00	4.00	4.00	4.00	5.00	3.00	2.50

Wyoming—Sheridan & Johnson Counties—State—Grade & Structs.

Forgey Construction Co., Casper, was awarded the contract in the amount of $509,667 by the State Highway Commission at Cheyenne for grading, draining, construction of 10 reinforced concrete culverts, one M.P.C.M.P. culvert, 1-3 continuous I-Beam span bridge and miscellaneous work on 6.9 mi. of the Sheridan-Buffalo Road. The following unit bids were submitted.

(A) Forgey Construction Co.....$509,667
(B) S. Birch & Sons Co..... 512,844
(C) Peter Kiewit Sons Co..... 517,004
(D) Leach Bros. 524,855
(E) S. J. Groves & Sons..... 530,749
(F) Taggart Construction Co.....$540,419
(G) Lowdermilk Bros. 553,447
(H) Knisely-Moore Co. 594,692
(I) Northwest Engineering Co..... 597,980
(J) J. H. & N. M. Monaghan..... 662,176

(1) 810,500 cu. yd. excavation.
(2) 27,600 cu. yd. selected matl. surf.
(3) 178,100 cu. yd. mi. haul.
(4) 2,300 hr. sheepsfoot roller.
(5) 125 hr. pneumatic tired roller.
(6) 13,550 M. gal. watering (emb.).
(7) 2,344 lin. ft. 18-in. C.M.P.
(8) 658 lin. ft. 24-in. C.M.P.
(9) 148 lin. ft. 30-in. C.M.P.
(10) 1,232 lin. ft. 36-in. C.M.P.
(11) 118 lin. ft. 48-in. C.M.P.
(12) 106.33 lin. ft. 150-in. M.P.C.M.P. (58-37).
(13) 438.5 lin. ft. 18-in. siphon R.C.P.
(14) 400 lin. ft. 12-in. standard R.C.P.
(15) 1,820 cu. yd. excav. for pipe culverts.
(16) 1,080 cu. yd. struct. excav.
(17) 1,040 cu. yd. sub-excav.
(18) 680 cu. yd. special backfill.
(19) 190 cu. yd. dry excav. for bridges.
(20) 180 cu. yd. wet excav. for bridges.
(21) 161,980 lb. struct. steel.
(22) 136,070 lb. reinf. steel.
(23) 1,326.5 cu. yd. Class A conc.
(24) 164.9 cu. yd. Class AA conc.
(25) 460 cu. yd. Class 1 riprap.
(26) 40 cu. yd. grouted riprap.
(27) 1,350 hr. machine tamping.
(28) 450 lin. ft. conc. paving for irr. ditch.
(29) 54,800 lin. ft. standard right-of-way fence.
(30) 19,200 lin. ft. type A right-of-way fence.
(31) 150 ea. end panels.
(32) 180 ea. brace panels.
(33) 115 ea. right-of-way markers.
(34) 1 ea. R. C. project markers.
(35) 1.6 mi. old road obliteration.
(36) Lump sum, remove exist. struct.

NON-PARTICIPATING IN FEDERAL AID

(37) Lump sum, repairing bridge.
(38) Lump sum, adjusting telephone line.

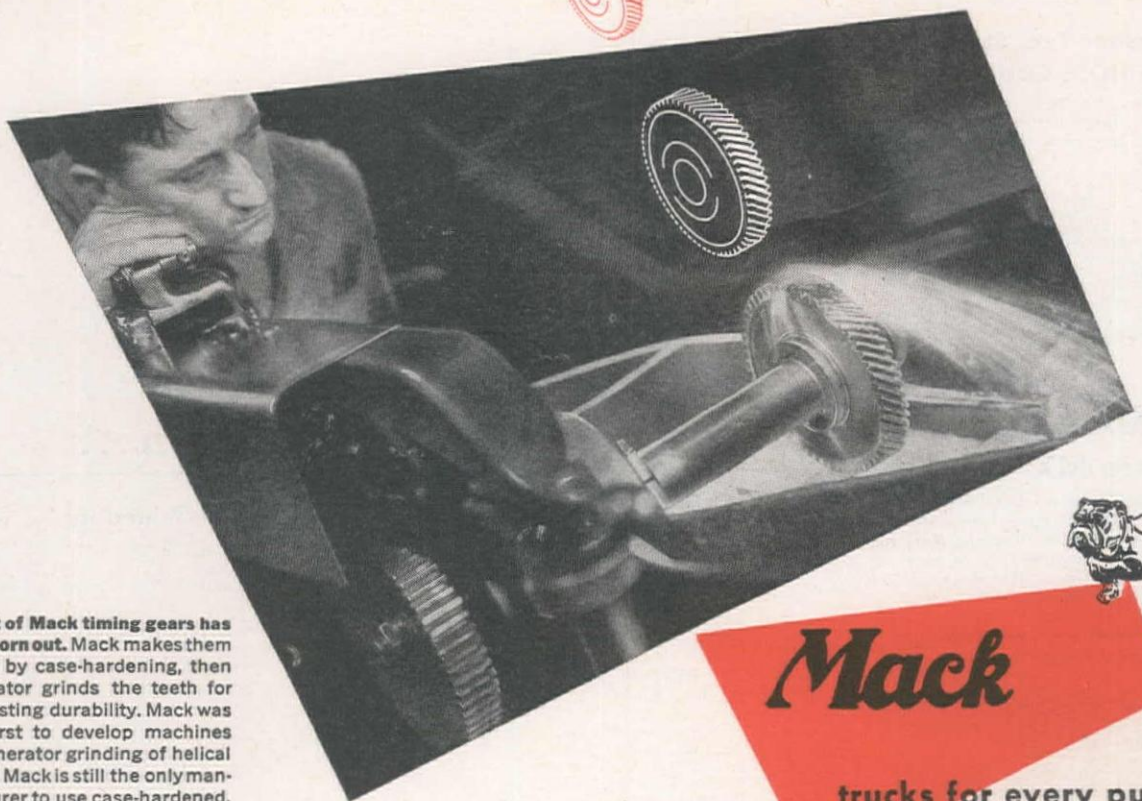
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(I)	(J)
(1)	.30	.21	.275	.295	.26	.28	.28	.37	.43
(2)	.30	.25	.38	.40	.50	.58	1.00	.30	.90
(3)	.17	.38	.20	.20	.15	.15	.20	.18	.20
(4)	8.00	10.00	9.50	8.00	6.00	11.25	7.00	9.20	6.00
(5)	6.00	13.00	5.00	5.00	5.00	7.00	8.00	6.25	6.00
(6)	1.75	1.65	1.25	2.00	1.50	2.80	1.75	2.10	1.50
(7)	3.50	3.50	3.00	3.00	4.10	3.30	3.50	3.25	3.00
(8)	5.00	5.00	5.00	4.50	6.00	4.50	4.60	4.60	4.50
(9)	6.50	6.50	6.00	6.00	7.30	5.00	5.50	5.30	5.50
(10)	7.00	10.00	9.00	8.00	10.80	8.25	7.50	8.60	7.50
(11)	10.00	14.00	17.00	13.00	14.30	10.00	12.00	12.00	12.00
(12)	75.00	93.50	80.00	75.00	140.00	72.12	80.00	73.20	75.00

(Continued on next page)

you get more work out of Mack Trucks

Built-in durability explains the stand-out performance of Mack trucks in construction and road building work. A. Teichert & Sons, Inc., San Francisco, Calif., have been buying Macks for the past 20 years. They have found that day in, day out, a Mack on the job means more work done on the job.

because..we put more work into Macks



No set of Mack timing gears has ever worn out. Mack makes them tough by case-hardening, then generator grinds the teeth for everlasting durability. Mack was the first to develop machines for generator grinding of helical gears. Mack is still the only manufacturer to use case-hardened, generator-ground timing gears.

Mack

trucks for every purpose

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.

6219-1

SINCE 1900, AMERICA'S HARDEST-WORKING TRUCK

(13)	6.00	7.00	6.00	7.00	5.75	3.92	6.00	4.80	5.00
(14)	4.00	3.00	3.00	2.50	3.50	2.43	3.50	2.60	2.50
(15)	2.00	2.65	2.50	2.00	2.00	2.00	2.50	1.80	1.00
(16)	3.00	5.45	3.00	3.00	2.00	3.00	3.00	3.00	1.00
(17)	1.00	.23	2.00	1.50	.60	1.40	.75	.90	1.00
(18)	.50	4.00	3.75	2.00	1.50	4.00	3.00	1.80	3.00
(19)	4.00	3.00	6.00	4.00	10.00	4.00	3.50	5.00	8.00
(20)	10.00	10.00	15.00	10.00	20.00	10.00	10.00	18.00	8.00
(21)	.15	.17	.15	.15	.14	.15	.15	.14	.16
(22)	.105	.11	.10	.105	.12	.105	.11	.10	.11
(23)	41.00	50.00	47.00	41.00	55.00	41.00	52.50	46.00	54.00
(24)	42.00	52.00	47.00	42.00	65.00	42.00	90.00	48.00	58.00
(25)	8.00	12.50	10.00	10.00	12.00	14.00	10.00	15.00	8.00
(26)	15.00	19.00	15.00	15.00	50.00	16.00	15.00	19.50	10.00
(27)	6.00	5.45	7.00	6.00	5.00	12.00	4.50	5.00	6.00
(28)	5.00	5.00	7.00	5.00	8.00	5.00	5.00	11.00	12.00
(29)	.20	.30	.22	.26	.40	.30	.35	.32	.32
(30)	.25	.35	.27	.34	.57	.32	.45	.42	.45
(31)	20.00	12.50	20.00	23.00	20.00	24.00	20.00	20.40	18.50
(32)	18.00	10.00	20.00	21.00	20.00	20.00	10.00	13.20	16.50
(33)	11.00	10.00	16.00	10.00	10.00	10.00	10.00	8.40	8.00
(34)	20.00	15.00	25.00	25.00	25.00	50.00	50.00	15.00	25.00
(35)	500.00	300.00	900.00	200.00	300.00	500.00	200.00	480.00	300.00
(36)	200.00	800.00	$1,000	300.00	500.00	$1,000	$1,500	550.00	$1,000
(37)	900.00	800.00	$1,500	950.00	$1,000	950.00	$1,000	$1,953	$2,500
(38)	100.00	800.00	250.00	100.00	200.00	150.00	250.00	240.00	250.00

Washington—Callam County—State—Grade & Struct.

Paul Jarvis, Inc., Seattle, will clear, grub, grade and surface approx. 1.7 mi. of Primary State Hwy. No. 9, and construct two steel and concrete bridges over the Sol Duc River, Snider's Ranger Station east and west, McDougal Creek Revision. 340 calendar days are allowed for completion. The Department of Highways at Olympia made the $367,704 award. Unit bids follow:

(1) Paul Jarvis, Inc. $367,704
(2) M. B. Butler 380,861
(3) Port Construction Co. $386,019
(4) David Nygren & J. J. Baudraun 386,026

		(1)	(2)	(3)	(4)
18.92	ac. clearing	650.00	700.00	700.00	500.00
11.56	ac. grubbing	650.00	700.00	700.00	700.00
112,030	cu. yd. common excav. incl. haul of 600 ft.	.40	.35	.40	.35
3,500	cu. yd. solid rock excav. incl. haul of 600 ft.	1.50	1.30	1.50	1.30
670	cu. yd. common trench excav. incl. haul of 600 ft.	1.00	2.00	2.00	2.00
49,300	cu. yd. sta. overhaul on above matl.	.02	.02	.02	.02
1,226.30	M. cu. yd. sta. overhaul on above matl.	5.00	5.00	5.00	5.00
550	cu. yd. struct. excav.	1.00	2.50	3.00	2.50
6,545	lin. ft. slope treatment	.15	.15	.18	.15
87.2	stas. (100 ft.) finishing roadway	15.00	10.00	13.00	10.00
7,480	cu. yd. selected roadway borrow, incl. haul	.70	.85	.75	.85
175	cu. yd. gravel backfill in pl.	2.50	2.00	5.00	2.00
3,310	cu. yd. cr. stone surf. top course in pl. on rdwy.	3.20	2.75	3.50	2.75
180	M. gal. water	2.50	2.00	4.00	2.00
800	cu. yd. cr. stone surf. top course in stkpl.	3.20	2.50	3.50	2.50
490	cu. yd. cr. cover stone in stkpl.	3.20	2.75	3.50	2.75
250	cu. yd. coarse cr. screen ⅝-in. to ¼-in. in stkpl.	3.20	3.25	4.50	3.25
90	cu. yd. fine cr. screen ¼-in. to 0-in. stkpl.	3.20	3.25	4.50	3.25
	MISCELLANEOUS ITEMS				
4	ea. reflector units, complete in place	10.00	15.00	10.00	15.00
42	ea. reinf. conc. right-of-way markers in place	4.50	5.00	3.00	5.00
3,230	lin. ft. std. bm. gd. rail ty. No. 1 or 2 Des. No. 6 comp. in pl.	2.50	2.25	3.00	2.25
5,150	lin. ft. spec. wood gutter Des. No. 1 comp. in place	1.30	1.25	1.50	1.25
80	lin. ft. std. open wood flume in place	2.00	1.35	2.50	1.35
21	cu. yd. hand placed riprap	7.00	8.00	10.00	8.00
356	lin. ft. bit. coated corr. met. pipe type No. 2, No. 16 ga., 8 dia. in pl.	3.00	2.25	2.50	2.25
105	lin. ft. std. reinf. conc. culv. pipe 18-in. diam. in place	3.00	3.25	3.00	3.25
294	lin. ft. std. reinf. conc. culv. pipe 24-in. diam. in place	4.50	4.50	4.50	4.50
210	lin. ft. std. reinf. conc. culv. pipe 30-in. diam. in place	6.50	8.00	6.00	8.00
54	lin. ft. std. reinf. conc. culv. pipe 36-in. diam. in place	10.00	10.00	10.00	10.00
	BRIDGES				
1,500	cu. yd. struct. excav.	11.00	21.00	15.00	18.00
744	cu. yd. conc. Class A in place	75.00	57.00	60.00	70.00
446	cu. yd. conc. Class F in place	50.00	57.00	60.00	70.00
366	cu. yd. conc. Class H in place	40.00	57.00	50.00	70.00
640	lin. ft. reinf. conc. bridge railing in place	7.00	6.50	9.00	10.00
247,000	lb. steel reinf. bars in place	.095	.093	.10	.10
568,000	lb. struct. steel in place	.185	.20	.19	.18
5,200	lb. cast steel in place	.32	.35	.55	.50
24	only, bridge drains, comp. in place	.55	67.00	60.00	60.00
84	lb. copper seals in place	1.25	2.00	2.00	2.00

Bridge and Grade Separation . . .

Montana—Prairie County—State—Widening

W. P. Roscoe Co., Billings, was awarded a $144,761 contract by the State Highway Commission at Helena, to construct a 220-ft. steel and concrete bridge over O'Fallon Creek and to widen a steel and concrete overpass over the Northern Pacific Railroad in the vicinity of Fallon on the Terry-Glendive Road. Project is to be completed by May 31, 1949. The following unit bids were submitted:

(1) W. P. Roscoe Co. $144,761
(2) Northwestern Engineering Company .. 149,283
(3) Inland Construction Co. $149,427

		(1)	(2)	(3)
	BRIDGE OVER O'FALLON CREEK			
288,150	lb. struct. steel	.16	.15	.17
60,100	lb. reinf. steel	.125	.12	.12
581.0	cu. yd. Class A conc.	45.00	60.00	45.00
168.4	cu. yd. Class AD conc.	45.00	65.00	50.00
1,052	cu. yd. excav. for structs.	9.25	5.00	12.00
441.9	lin. ft. conc. handrail	8.00	6.00	7.50
20,736	lb. steel bearing piles	.15	.09	.13
505	lin. ft. driving st. bearing piles	2.00	6.00	3.00
	WIDENING OVERPASS STRUCTURE			
2,094	lb. struct. steel	.52	.20	.25
39,660	reinf. steel	.125	.17	.12
137.6	cu. yd. Class A conc.	55.00	60.00	50.00
179.5	cu. yd. Class AD conc.	55.00	65.00	65.00
283.4	lin. ft. conc. handrail	8.00	6.00	7.50
890	cu. yd. excav. for structs.	6.00	5.00	4.00
Lump sum, rev. of exist. struct.		$4,500	$3,000	$5,000
Lump sum, mainatining traffic		$3,000	$4,000	$4,000

Montana—Madison County—State—Steel & Concrete

Hansen & Parr Construction Co. of Spokane, Wash., will construct a 150-ft. and a 180.56-ft. steel and concrete bridge over the Beaverhead River on the Dillon-Twin Bridges Road, involving about 294,000 lbs. structural steel; 67,000 lbs. reinforcing steel; and 464 cu. yds. Class "A" concrete. The State Highway Commission at Helena made the $123,410 award. The project is to be completed by May 31, 1949. Unit bids are as follows.

(1) Hansen & Parr Construction Co.....$123,410
(2) E. H. Blakeslee Construction Co..... 130,045
(3) McLaughlin Construction Co.....$130,086

	(1)	(2)	(3)
293,835 lb. struct. steel	.165	.17	.16
67,200 lb. reinf. steel	.12	.12	.14
464 cu. yd. Class A conc.	43.00	60.00	65.00
241.6 cu. yd. Class AD conc.	72.00	60.00	70.00
362.29 lin. ft. steel handrail	10.75	10.00	10.00
302 lin. ft. conc. bridge rail	5.00	10.00	10.00
4,200 lin. ft. untreated found. piling	2.00	2.00	1.50
965 cu. yd. excav. for struct.	11.10	10.00	10.00
Lump sum, rem. exist. struct. and ma. tr.	$5,000	$5,000	$4,000

Sewerage . . .

California—Los Angeles County—City—Sanitary Sewers

MacDonald & Kruse and Hensler Construction Corp., joint venturers of Glendale, submitted the low bid of $280,479 to the City Board of Public Works at Los Angeles, for the installation of sanitary sewers in Whitsett Ave., between Kittridge St. and Moorpark St., Los Angeles. Unit bids are as follows:

(A) MacDonald & Kruse and Hensler Construction Corp.....$280,479
(B) Martin Construction Co., Inc..... 284,943
(C) Artukovitch Bros. 293,969
(D) R. A. Wattson Co..... 294,988
(E) P. & J. Artukovich, Inc.....$314,577
(F) Bebek & Brkich..... 337,726
(G) Mike Radich & Co..... 339,670
(H) M. Miller 398,170
(I) Engineer's Estimate..... 254,950

(1) 2,625 lin. ft. 30-in. extra str. pipe sewer.
(2) 2,845 lin. ft. 24-in. extra str. pipe.
(3) 7,050 lin. ft. 21-in. extra str. pipe
(4) 1,943 lin. ft. 18-in. extra str. pipe.
(5) 186 lin. ft. 8-in. extra str. pipe.
(6) 162 lin. ft. 8-in. std. pipe sewer.
(7) 22 units manhole "B".
(8) 20 ea. Junction Chamber "F".
(9) 6 ea. Drop Manhole "S".
(10) 1 ea. Junction Chamber "G".
(11) 1 ea. Junction Chamber "H".
(12) 694 cu. yd. Class "D" pipe reinf.
(13) 12.364 sq. ft. Class AC-4 resurf.
(14) 1,621 sq. ft. Class AC-8 resurf.
(15) 1,824 sq. ft. Class "C" conc. resurf.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	24.00	22.00	22.00	18.50	21.00	25.00	29.00	29.50	20.35
(2)	17.00	19.00	18.00	17.00	19.00	22.00	22.30	26.40	15.00
(3)	14.50	15.50	16.50	19.50	18.00	19.00	18.50	22.00	13.10
(4)	14.00	14.50	16.50	14.00	17.25	18.00	15.00	20.50	12.00
(5)	9.00	5.40	12.00	5.00	9.00	8.00	6.00	25.00	7.50
(6)	8.00	5.00	10.00	4.00	8.50	7.75	5.00	20.00	6.60
(7)	350.00	300.00	300.00	325.00	400.00	260.00	375.00	375.00	365.00
(8)	350.00	350.00	300.00	325.00	425.00	270.00	375.00	400.00	375.00
(9)	400.00	400.00	350.00	350.00	500.00	285.00	400.00	425.00	360.00
(10)	350.00	500.00	325.00	325.00	500.00	270.00	400.00	405.00	290.00
(11)	350.00	500.00	325.00	325.00	500.00	270.00	400.00	405.00	395.00
(12)	18.00	15.00	15.00	15.00	20.00	25.00	20.00	18.00	25.00
(13)	.35	.30	.40	.25	.35	.40	.30	.60	.25
(14)	.45	.80	.60	.50	.65	.50	.60	.90	.50
(15)	.75	.80	.60	.60	.75	.75	.60	1.00	.60

Building . . .

South Dakota—Charles Mix County—Corps of Engrs.—Housing & Facil.

Busboom & Rauh of Salina, Kansas, were low before the Corps of Engineers at Omaha, Nebraska, with a bid of $2,347,550 for the construction of buildings and appurtenances, for Pickstown Stage III for Fort Randall Reservoir Project near Lake Andes. Unit bids follow:

(1) Busboom & Rauh.....$2,347,550
(2) Martin K. Eby Construction Co..... 2,461,086
(3) Engineer's Estimate $1,298,127

	(1)	(2)	(3)
SITE GRADING			
10,500 cu. yd. site grading	1.00	1.05	0.693
BUILDINGS			
Lump sum, hospital	$316,076	$332,125	$136,445
Lump sum, grade and high school	$579,026	$604,857	$311,195
Lump sum, community recreation bldg.	$186,096	$192,430	$82,800
Lump sum, theatre bldg.	$141,239	$139,940	$89,862
9 ea. trailer block utility bldg.	$23,311	$26,730	$13,330
9 ea. collection station	600.00	580.00	463.38
205 ea. tenant fuel storage locker	35.00	42.00	31.43
1 ea. workmen's mess hall	$31,757	$34,850	$20,178
6 ea. workmen's dorm.	$62,601	$64,861	$35,356
Lump sum, complete workmen's dorm. No. 5	$50,264	$51,310	$28,817
Lump sum, complete west wing of workmen's dorm. No. 6	$40,655	$41,876	$10,438
Lump sum, complete workmen's dorm. No. 6 (except west wing)	$17,694	$22,995	$21,049
Lump sum, power plant bldg.	$94,640	$93,628	$73,572
Lump sum, fuel oil storage system	$15,000	$12,945	$7,831
Lump sum, Diesel locomotive house	$49,500	$54,790	$27,370
350 ea. window glass 9 x 12 in.	.90	.80	.63
15 ea. door glass, 10 x 28 in.	1.25	1.25	1.29
Lump sum, cooling tower basin	$3,800	$3,904	$1,422
WATER SUPPLY LINES			
2,430 lin. ft. 8-in. water line	6.40	6.44	5.31
2,590 lin. ft. 6-in. water line	5.55	5.32	4.06
920 lin. ft. 3-in. water line	4.25	4.24	2.63
1,400 lin. ft. 2-in. water line	3.05	3.50	2.70
220 lin. ft. 1¼-in. water line	2.75	2.94	1.91
850 lin. ft. 1-in. water line	2.10	2.05	1.89
2 ea. 8-in. valve and valve box	165.00	175.00	110.92
6 ea. 6-in. valve and valve box	122.00	115.00	83.39
4 ea. 3-in. valve and valve box	90.00	85.00	47.74
21 ea. 2-in. valve and valve box	85.00	87.00	38.66

(Continued on next page)

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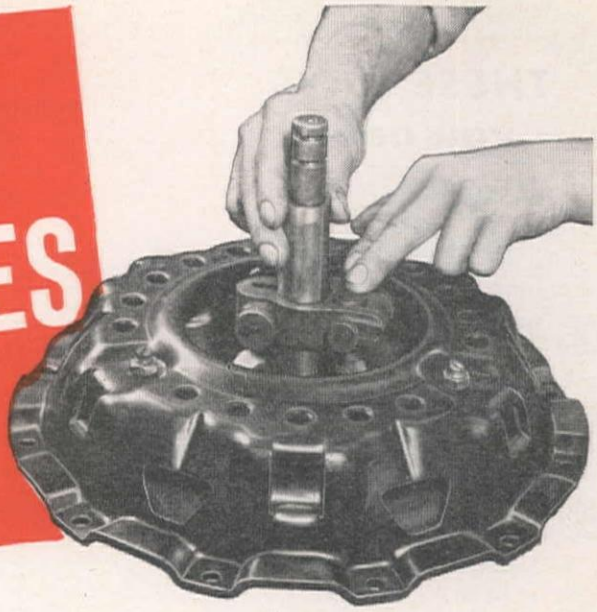

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1	ea. 1¼-in. valve and valve box	75.00	73.00	34.19
9	ea. 1-in. curb stop and box	60.00	68.00	16.33
19	ea. fire hydrant	358.00	365.00	189.71
	SANITARY AND STORM SEWERS			
62	lin. ft. 10-in. san. sewer 0 to 6-ft. depth	3.85	3.95	2.36
355	lin. ft. 10-in. san. sewer 6.1 to 8-ft. depth	4.40	4.10	2.47
441	lin. ft. 10-in. san. sewer 8.1 to 10-ft. depth	5.50	5.45	2.54
2,266	lin. ft. 8-in. san. sewer 0 to 6-ft. depth	3.60	3.75	2.00
926	lin. ft. 8-in. san. sewer 6.1 to 8-ft. depth	4.15	4.10	2.20
1,130	lin. ft. 6-in. san. sewer 0 to 6-ft. depth	3.40	3.60	1.84
555	lin. ft. 6-in. san. sewer 6.1 to 8-ft. depth	3.80	3.85	2.07
265	lin. ft. 6-in. san. sewer 8.1 to 10-ft. depth	4.95	5.02	2.24
90	lin. ft. 6-in. san. sewer 10.1 to 12-ft. depth	6.50	6.35	2.53
60	lin. ft. 8-in. C.I. san. sewer (over water lines)	6.50	6.40	6.18
40	lin. ft. 6-in. C.I. san. sewer (over water lines)	5.40	5.50	3.84
16	ea. standard manhole	190.00	194.00	172.59
23	vert. ft. addtl. depth of std. manhole	28.00	27.00	20.66
1	ea. drop manhole	265.00	278.00	213.90
2	vert. ft. addtl. depth of drop manhole	31.00	30.00	37.45
180	lin. ft. 6-in. storm sewer	3.00	4.00	2.49
	ELECTRICAL DISTRIBUTION SYSTEM			
53	ea. 30-ft. Class 5 pole	41.00	41.02	31.10
21	ea. 35-ft. Class 5 pole	50.00	53.20	38.63
24	ea. 40-ft. Class 5 pole	64.00	61.15	45.31
13	M. ft. bare copper conductor No. 6 wire	65.00	60.05	67.45
2.8	M. ft. TBWP copper conductor No. 6	82.00	80.05	98.16
1	M. ft. TBWP copper conductor No. 4	110.00	125.00	139.38
17	M. ft. TBWP copper conductor No. 2	185.00	186.00	155.99
3	ea. 5 KVA transformer	60.00	35.80	36.73
3	ea. 10 KVA transformer	65.00	22.00	38.83
7	ea. 25 KVA transformer	80.00	38.00	36.67
2	ea. 50 KVA transformer	120.00	60.00	53.85
26	ea. 4-pin single arm assembly	20.00	23.00	16.15
15	ea. 4-pin double arm assembly	40.00	39.20	42.16
2	ea. 6-pin single arm assembly	30.00	30.00	28.51
2	ea. 6-pin double arm assembly	50.00	58.20	37.42
20	ea. primary clevis, no bolt	5.00	4.80	3.80
15	ea. primary clevis, with bolt	5.20	6.15	3.66
10	ea. secondary clevis, no bolt	4.80	5.40	3.34
5	ea. secondary clevis, with bolt	6.00	6.20	4.02
81	ea. 3-spool wire rack	6.00	7.86	6.04
10	ea. 4-spool wire rack	8.00	10.25	7.31
20	ea. wire holder	2.00	2.10	1.19
27	ea. 6,000-lb. anchor	25.00	18.00	8.79
1	ea. 12,000-lb. anchor	35.00	16.00	9.20
27	ea. 6,000-lb. down guy	20.00	37.40	20.05
1	ea. 12,000-lb. down guy	22.00	31.21	21.44
1	ea. overhead guy 6,000-lb.	34.00	58.62	15.85
27	ea. guy guard	6.00	6.30	6.58
15	ea. ground	12.00	11.80	16.63
12	ea. single pole mounting for 1 transformer assembly	120.00	132.40	85.44
3	ea. single pole mounting for 3 transformer assembly	220.00	502.00	125.83
1	ea. 3 disconnects	100.00	96.48	65.43
50	ea. trailer camp assembly	180.00	180.50	164.43
1	ea. 3 station lightning arrester	50.00	45.76	43.62
1	ea. change 1 PM1 mounting to 1 PM3 25 KVA mounting	200.00	176.40	66.38
	RAILROAD, STREET CONSTRUCTION AND MISCELLANEOUS			
12,400	cu. yd. unclassified excav.	1.00	1.05	.44
9,000	cu. yd. stabilized gravel	4.60	4.75	3.34
18,100	gal. asph. Grade MC-1 for prime coat	.28	.31	.151
18,800	gal. asph. Grade RC-2 for seal coat	.28	.31	.206
940	ton cover aggregate for seal coat	6.90	6.85	2.40
22,000	sq. ft. 4- in. conc. sidewalk	.55	.58	.316
570	lin. ft. double purpose sidewalk	3.90	4.20	2.39
1,365	lin. ft. conc. curb	3.25	4.00	1.26
120	lin. ft. 6-in. sidewalk underdrain	2.65	2.40	1.10
370	ea. wood guard post	5.20	4.50	1.73
62	lin. ft. 12-in. corr. metal circ. pipe (16 gauge)	3.50	3.74	2.70
44	lin. ft. 18-in. corr. metal circ. pipe (16 gauge)	7.20	7.34	4.93
360	lin. ft. 18x11-in. corr. metal pipe arch (16 gauge)	6.95	7.10	3.16
40	lin. ft. 22x13-in. corr. metal pipe arch (16 gauge)	7.80	7.60	4.21
96	lin. ft. 25x16-in. corr. metal pipe arch (16 gauge)	7.95	7.84	5.10
44	lin. ft. 29x18-in. corr. metal pipe arch (14 gauge)	9.10	8.90	5.65
184	lin. ft. 36x22-in. corr. metal pipe arch (14 gauge)	10.80	11.10	7.23
48	lin. ft. 43x27-in. corr. metal pipe arch (12 gauge)	14.50	15.40	11.22
32	lin. ft. road crossing	85.00	95.00	5.09
Lump sum,	railroad spur	$5,600	$6,200	$1,750

Dam . . .

South Dakota—Charles Mix County—Corps of Engineers—Earthwork

Western Contracting Corp., Sioux City, Iowa, submitted the low bid of $4,405,800 to the Corps of Engineers at Omaha, Neb., for the initial excavation for the outlet works and construction of rolled embankment for the Fort Randall Dam, located on the Missouri River about 7 mi. south of Lake Andes. 500 days are allowed for completion. The following submitted unit bids:

(1) Western Contracting Co. $4,405,800
(2) Brown & Root, Inc. and Wunderlich Contracting Co. 5,197,150
(3) Peter Kiewit Sons Co., Morrison-Knudsen Co., Inc., Macco Corp., and Condon-Cunningham Co. 5,244,950
(4) Mittry Bros. Construction Co. 5,316,700
(5) S. J. Groves & Sons, Co., Bowen & McLaughlin, C. F. Lytle Co., and Amis Construction Co. 5,930,400
(6) J. A. Jones Construction Co., Wright Contracting Co., and Hooper Construction Co. 6,278,960
(7) Engineer's Estimate 5,352,553

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lump sum, clear and grub	$67,000	$7,000	$150,000	$45,000	$15,000	$30,000	$12,429
6,630,000 cu. yd. unclass. excav.	.30	.35	.35	.40	.39	.473	.305
100,000 cu. yd. shale excav.	.48	.70	.57	.65	.72	.772	.567
3,160,000 cu. yd. chalk excav.	.48	.70	.57	.65	.72	.772	.843
100,000 cu. yd. stock piled blds.	1.70	1.60	2.00	.40	3.00	1.00	.707
1,500 cu. yd. pervious backfill	1.00	3.50	2.50	7.00	3.00	3.50	.548
5,400,000 cu. yd. embankment	.09	.06	.11	.06	.10	.07	.082
650,000 cu. yd. imperv. blanket	.11	.04	.08	.06	.07	.03	.061
16,000 M. gal. wtr. for compctn.	1.90	2.00	2.50	3.50	3.00	4.50	1.62
1,000 hr. addtl. rolling with tamper-type roller	6.80	14.00	12.00	12.00	8.00	10.00	8.94
15 ea. settlement gage	600.00	360.00	500.00	$1,000	800.00	300.00	219.38
700 lin. ft. settlem't gage pipe	14.00	30.00	10.00	6.00	35.00	10.00	7.53

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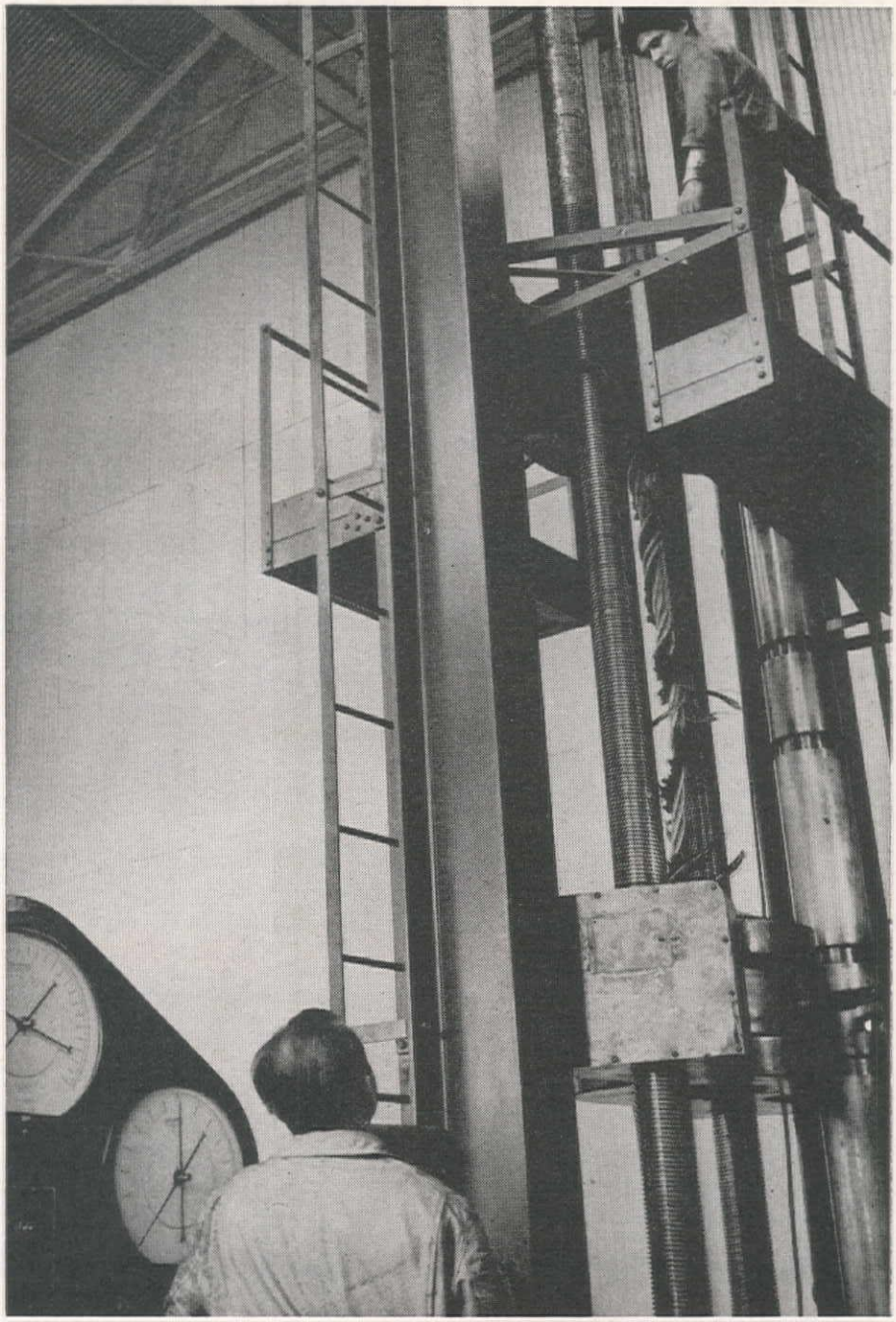

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American Steel & Wire Co.

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United States Steel Export Company, New York

UNITED STATES STEEL

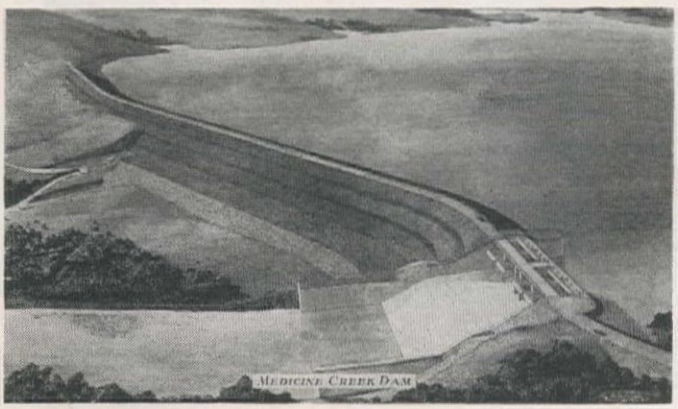
CONSTRUCTION SUMMARY

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 $75,000 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 . . .

The **C. F. Lytle Co.**, Sioux City, Iowa, and the **Amis Construction Co.** of Oklahoma City, Okla., joint venturers, were awarded the $4,270,006 contract by the Bureau of Reclamation at Indianola, Nebraska, for the construction of Medicine Creek Dam, Frenchman-Cambridge Unit, of Missouri Basin Plan. The dam will be situated on Medicine Creek about two miles west and seven miles north of Cambridge, Furnas County, Nebraska. Medicine Creek Dam is to be a rolled earth-fill structure 102 ft. high with a crest length of 4,500 ft. Total excavation will amount to three and one-half million cu. yds.; the embankment will require two and one-half million cu. yds. of fill. Included in the construction is a concrete spillway and a 7.5 mi. gravel surfaced access road. The dam reservoir will have a capacity of 40,000 acre-feet at normal times and an additional flood water capacity of 53,000 acre-feet. Irrigation water will be supplied to 35,500 acres of presently unirrigated land and supplemental water will be furnished for 17,600 acres now receiving insufficient water. The contractor will have 1,200 calendar days to complete the job.



L. E. Dixon Co. of San Gabriel, Calif., and **Arundel Corp.**, Baltimore, Md., have been awarded a contract by the Pacific Gas & Electric Co., San Francisco, Calif., for the construction of the Rock Creek tunnel on the north fork of the Feather River, near Cresta in Butte County, Calif. The tunnel will be approx. 22,800 ft. long, 25 ft. in diameter and horseshoe shaped.

Parker, Steffens & Pearce, San Francisco, Calif., contractors have the $2,000,000 contract from General Electric Co., San Francisco, for the construction of a main factory building to be built from structural steel frame and steel sash and pressed asbestos material for sides with an attached two-story reinforced concrete and steel sash office building to be located in San Jose, Calif.

Morgan Construction Co., Worcester, Mass., was awarded a contract in the sum of $3,000,000 for the construction of a rod mill and wire drawing plant in Pueblo, Colorado, for the Colorado Fuel & Iron Corp. of Denver, Colo.

Robert E. McKee of El Paso, Tex., on the low bid of $5,712,739 was awarded the contract for construction of a 250-bed Veterans' Administration general medical and surgical hospital at Big Spring, Howard County, Tex. The Corps of Engineers at Albuquerque, New Mexico, made the award.

Western Contracting Corp., Sioux City, Iowa, on the bid of $4,405,800 was awarded the contract by the Corps of Engineers of Omaha, Nebraska, for the initial excavation for outlet works and construction of rolled embankment of the Fort Randall Dam, located on the Missouri River about 80 mi. northwest of Yankton and 7 mi. to the south of Lake Andes in Charles Mix County, South Dakota. The work includes excavation of overburden and chalk and construction of rolled embankment across the left channel of the Missouri River. Time allotted for completion is 500 days.

Bressi & Bevanda Constructors, Inc., Los Angeles, Calif., received a $3,381,174 contract from the Corps of Engineers, Los Angeles, for the construction of improvements to the Los Angeles River. The main features of the work include clearing site and removing of obstructions, excavating, backfill and fill, driving steel sheet and steel bearing piles, construction of temporary railroad trestle and shoofly, placing sand and gravel filters, installing drain tile, building reinforced concrete invert walls, footings, piers and abutments, steel work on existing railroad bridge, installing side drainage structures and pipe, constructing gaging station and fencing. The improvements are to be made on Schedule A, Lankershim Blvd. to Vineland Ave., River Mile 35.04 to River Mile 36.32; Schedule B, Vineland Ave. to Tujunga Wash, River Mile 36.32 to River Mile 37.71, Los Angeles County, California.

S. Birch & Sons Construction Company of Great Falls, Montana, was awarded a contract by the Wyoming State Highway Commission at Cheyenne, for the construction of about 10 miles of roadway between the city limits of Wheatland and Chugwater in Platte County, Wyoming. Included in the contract is the construction of over one mile between the projected hwy. and the Bosler cut-off to U. S. Hwy. No. 30 and Laramie. The $567,895 contract is one of the largest ever let in the history of the department.

Donald Groom of San Leandro, Calif., will spend approximately $2,000,000 for the construction of 15 frame and stucco apartment buildings and garages to be erected in Alvingroom Court, Oakland, Calif. The owner will build and award sub-contracts.

Nettleton-Baldwin-Anderson, Inc., of Seattle, Wash., own and will build two Class A, reinforced concrete apartment buildings with exterior walls of architectural concrete and brick base, 14-stories each, 360 apartments, total, 203 units will have three and a half rooms, 99 units to have three rooms, 53 will be four and a half rooms and there will be 4 two-room units. About $3,000,000 will be spent on the construction. The apartment buildings are to be erected on the block bounded by 8th Ave., Madison Ave., 9th Ave., and Spring St. in Seattle, Wash.

The **L. E. Dixon Co.** of San Gabriel, Calif., will construct the additions to a water softening plant. The work includes the construction of mixing and settling basins, filters, zeolite softenings, salt storage, basins, railway spur track extension, etc. The plant is designed for softening water by lime-zeolite process and will increase plant capacity from 100 to 200 m.g.d. It is located in an unincorporated area near La Verne, Los Angeles County, Calif. The $2,592,400 contract was awarded by the Metropolitan Water District of Southern California in Los Angeles.

Harms Bros., Sacramento, Calif., will grade, apply plant mix surfacing on cement treated base and on untreated rock base for a distance of 4.1 miles between the San Joaquin River and Arcola School in Madera County, Calif. The Division of Highways at Sacramento awarded the $921,103 contract.

United Construction Co. of Long Beach, Calif., was awarded the $2,261,056 contract by the Board of Harbor Commissioners of Long Beach, for the construction of steel sheetpile bulkhead and other improvements at Piers B and C, Long Beach Outer Harbor. **Franks Dredging Co.**, San Francisco, and **Guy F. Atkinson Co.** of Long Beach were awarded the $436,914 contract by the Harbor Commission for the hydraulic fill at the Long Beach Piers B and C.

The **McNeil Construction Co.**, Los Angeles, Calif., has been awarded a $1,000,000 contract on the construction of a Class "A" one- and part two-story department store building that will cover an area 300 by 300 ft., will have reinforced concrete walls and floors and a flat slab concrete roof for parking. The building is to be erected on the northwest corner of Sepulveda and La Tijera Blvds. in the Westchester District of Los Angeles for the Los Angeles Extension Co.; Milliron's Fifth Street Store, lessee, Los Angeles, Calif.

Moore & Roberts of San Francisco, Calif., will build Units 1 and 4, South Ward Group of Napa State Hospital at Imola, Calif. The $1,887,777 general contract was awarded by the State Division of Architecture at Sacramento, Calif.

Highway and Street . . .

Arizona

COCHISE CO.—**Daley Construction-Acme Materials Co.,** 2400 So. 16th St., Phoenix—$198,394 for approx. 9 mi. drain, base and bitum. surf. of Benson-Douglas Hwy., starting approx. 5 mi. east of Bisbee and extending southeasterly—by State Highway Department, Phoenix. 1-15

MARICOPA CO.—**W. R. Skousen,** Box 71, Mesa—$126,435 for approx. 5 mi. grade, drain, base and surf. of Gilbert Rd., beginning at Higley Rd. and extending to Base Line Rd.—by State Highway Department, Phoenix. 1-15

California

INYO CO.—**Swedlow Engineering Co., Inc.,** 1650 10th St., Santa Monica—$132,350 for 4.9 mi. grade and penetration treatment, betw. Water Canyon and 11 mi. north of Trona—by Division of Highways, Sacramento. 1-20

MADERA CO.—**Harms Bros.,** Rt. 4, Box 2220, Sacramento—$921,103 for 7.1 mi. grade and surf. betw. San Joaquin River and Arcola School—by Division of Highways, Sacramento. 1-20

RIVERSIDE CO.—**Arthur A. Johnson,** 421 Pearl St., Laguna Beach—$196,266 for 1.8 mi. grade, base and bitum. surf., betw. four mi. west of Blythe and Colorado River—by Division of Highways, Sacramento. 1-22

Colorado

MONTEZUMA CO.—**Lively & Foutz,** Box 96, Farmington, N. Mex.—$139,132 for 5.6 mi. gravel surf. of State Hwy. No. 147, betw. Dolores and Lewis — by State Highway Department, Denver. 1-13

RIO BLANCO CO. — **Harrison Construction Co. & R. R. Atchison Co.,** Box 4041, So. Denver Station, Denver—$349,098 for 5.3 mi. gravel surf. of State Hwy. No. 64, betw. Rangley and Meeker—by State Highway Department, Denver. 1-5

ROUTT CO.—**Brown Construction Co.,** Pueblo—$162,155 for 4.7 mi. gravel surf. on State Hwy. No. 131, betw. Steamboat Springs and Haybro—by State Highway Department, Denver. 1-1

SAGUACHE AND RIO GRANDE COS.—**C. L. Hubner Co.,** Denver—$156,981 for 5.1 mi. gravel surf. on State Hwy. No. 112, betw. Del Norte and Center—by State Highway Department, Denver. 1-1

Idaho

ADA CO.—**Triangle Construction Co.,** Box 2617, Boise—$89,750 for 8.8 mi. surf. and seal coat of Meridian-Kuna Rd. and 1.9 mi. bitum. surf. of Linder Rd.—by Bureau of Highways, Boise. 1-16

BLAINE CO.—**H. A. Gardner Construction Co.,** Blackfoot—$460,110 for 9.8 mi. grade, drain and surf. of U. S. Hwy. No. 93, Timmerman Hill section—by Bureau of Highways, Boise. 1-1

Nevada

HUMBOLDT CO.—**Silver State Construction Co.,** Fallon—$148,210 for 13.7 mi. grade, base and surf. of Rt. 18, FAS-613, Section A, from junction of U. S. Hwy. 40, three mi. southeast of Golconda, to Redhouse Junction—by Department of Highways, Carson City. 1-9

New Mexico

GRANT CO.—**O. C. Cowart,** Albuquerque—$274,313 for 5.7 mi. grade, drain, four multiple conc. box culverts, base, surf. and seal coat of State Hwy. No. 180, betw. Silver City and Lordsburg—by State Highway Department, Santa Fe. 1-16

McKINLEY CO.—**Bowen & McLaughlin,** Box 4037, Phoenix, Ariz.—$424,135 for 5.8 mi. grade, minor drain., five multiple conc. box culverts, bitum. top course surf., seal coat of U. S. Hwy. No. 66, betw. Ariz.-N. Mex. state line and Gallup—by State Highway Department, Santa Fe. 1-16

Oregon

HARNEY CO.—**M. W. Brown,** Box 222, Redding, Calif—$152,929 for 11.3 mi. grade and surf. of Burns-Rome Hwy.—by Public Roads Administration, Portland. 1-1

MALHEUR CO.—**E. C. Hall Co.,** Rt. 6, Box 630, Portland—$265,162 for 14.9 mi. of surface of Follyfarm-Scotts Butte section of Rome-Princeton secondary hwy.—by State Highway Commission, Salem. 1-1

YAMHILL CO.—**Frank M. Parson,** Forest Grove—$110,000 for 2.8 mi. grade and surf. of Carlton-Chehalem creek section of Carlton-Chehalem Rd.—by State Highway Commission, Salem. 1-5

Utah

WASHINGTON CO.—**H. W. Glenn,** Box 2017, Salt Lake City—$165,223 for gravel surf. of State Hwy. No. 18, betw. Veyo and Central—by State Road Commission, Salt Lake City. 1-3

Washington

KING CO.—**Western Asphalt Co.,** 309 W. 39th, Seattle—$392,151 for 9.4 mi. grade, surf. and pave of Primary State Hwy. No. 1, junction Secondary State Hwy. No. 5-A to Pierce Co. line—by Department of Highways, Olympia. 1-20

Wyoming

PLATTE CO.—**S. Birch & Sons Construction Co.,** Ford Bldg., Great Falls, Mont.—$567,895 for approx. 10 mi. grade and surf. hwy. betw. Wheatland and Chugwater and one mi. road constr. betw. project hwy. and Bosler cut-off to U. S. Hwy. 30 and Laramie—by State Highway Commission, Cheyenne. 1-23

Bridge & Grade Separation...

California

LOS ANGELES CO. — **Spencer Webb Company,** Box 921, Inglewood—$594,498 for two undercrossings and one overcrossing on Hollywood Parkway at Virgil Ave., Hoover St., and Rosemont Ave., respectively—by Division of Highways, Sacramento. 1-22

TUOLUMNE CO. — **Elmer J. Warner,** 1103 Sycamore St., Stockton—$181,548 for bridge and approaches across Tuolumne River at Stevens Bar—by Division of Highways, Sacramento. 1-1

Colorado

PHILLIPS AND YUMA COS.—**Gardner & Eskridge,** Glenwood Springs—$136,388 for constr. of four bridges betw. Haxtun and Yuma on State Hwy. No. 59—by State Highway Department, Denver. 1-24

WELD CO.—**L. J. Hesser,** Box 1448, Greeley—$62,225 for bridges and approaches on 0.9 mi. of State Hwy. No 3, betw. Ault and Nunn—by State Highway Department, Denver. 1-1

New Mexico

OTERO CO.—**Brown Construction Co.,** Box 1479, Albuquerque—$327,848 for 6.7 mi. grade, drain, surf. and seal coat, five multiple conc. box culverts and one conc. and steel bridge 162.84 ft. long on U. S. Hwy. 54, betw. Carrizozo and Tularosa—by State Highway Department, Santa Fe. 1-16

Oregon

MULTNOMAH CO. — **General Engineering Co.,** Seattle, Wash.—$334,250 for Sandy River bridge over Columbia River Hwy. near Troutdale—by State Highway Commission, Salem. 1-5

Water Supply . . .

California

ALAMEDA CO.—**R. Goold & Son,** Box 190, Stockton—$152,475 to install C. I. mains from Los Aromas pumping plant to Sleepy Hollow Subdivision, Oakland—by East Bay Municipal Utility District, Oakland. 1-26

LOS ANGELES CO.—**L. E. Dixon Co.,** 409 So. California St., San Gabriel—$2,592,400 to expand water softening plant, unin-

corporated area near La Verne—by Metropolitan Water District of Southern California, Los Angeles. 1-28

YUBA CO. — **Pittsburgh & Des Moines Steel Co.,** Santa Clara & Alviso Rd., San Jose—$62,300 for all-steel, 300,000-gal. capacity water tank and tower at east corner of 10th and Swezy Sts., Marysville—by California Water Service Co., Marysville. 1-1

Utah

UTAH CO. — **Neils Fugal,** Springville—$370,565 to install water distribution system in Pleasant Grove—by City Council, Pleasant Grove.

Airport . . .

Utah

MILLARD CO.—**Wade Brothers,** Ogden—$59,800 for constr. of first station at Hinckley Airport — by Airport Commission, Hinckley. 1-2

Sewerage . . .

California

GLENN CO. — **McGuire & Hester,** 796 66th Ave., Oakland — $67,817 to install main trunk sewers in Willows—by City Council, Willows. 1-21

KERN CO.—**R. H. Downer Corp.,** 305 E. Weber Ave., Stockton—$68,623 to install sewer lines, Annex No. 5, Oildale — by North of River Sanitary District No. 1, Oildale. 1-8

LOS ANGELES CO.—**Artukovich Bros.,** 7320 N. Atlantic Ave., Hynes—$79,264 for units 7 and 8 of Joint Outfall "B" trunk sewer from Rosemead and Foothill Blvds. to Paloma St. and Eaton Dr., then to Foothill Blvd. and Washington St., in and near Pasadena—by County Sanitation District No. 2, Los Angeles. 1-13

LOS ANGELES CO.—**Martin Construction Co., Inc.,** 1529 Olympic Blvd., Montebello—$467,162 to install sanitary sewers in Kaster Ave., betw. Lassen St. and Burbank Blvd., Van Nuys District, Los Angeles—by City Council, Los Angeles. 1-22

SAN DIEGO CO. — **Carroll & Foster,** 2260 Main St., San Diego — $97,846 to constr. Section II, Trunk Sewer No. 3, Mission Valley trunk sewer, from city boundary to lot 14, Marcellena tract, approx. 3.3 mi. of sewer main and appurt., San Diego—by City Council, San Diego. 1-2

SANTA CLARA CO.—**Karl C. Hahmeling,** 1710 Mt. Diablo Ave., Stockton—$51,401 to install sanitary sewers in Escuela Annex, Mountain View—by City Council, Mountain View. 1-26

SANTA CLARA CO. — **A. J. Peters & Son,** 410 N. 10th St., San Jose—$86,876 for vit. clay, C. I., and transite pipe sanitary sewer mains, wye branches and house laterals, with standard manholes, Palo Alto—by City Council, Palo Alto. 1-15

Oregon

LANE CO.—**Warner & Jeske,** Eugene—$118,292 for sewage treatment plant and installation of sewage and water systems at Lookout Point Dam housing area, near Lowell—by Corps of Engineers, Portland. 1-1

Washington

YAKIMA CO. — **P. S. Lord,** 4507 N. E. Milwaukie Ave., Portland, Ore.—$203,788 for intercepting trunk sewer, underdrain and lateral sewer system in Sunnyside—by City Council, Sunnyside. 1-1

Waterway . . .

California

LOS ANGELES CO.—**Bressi & Bevanda Constructors, Inc.,** 417 So. Hill St., Los Angeles—$3,381,174 for Los Angeles River improvement, Lankershim Blvd. to Vineland Ave., River Mi. 35.40 to River Mi. 36.32; Vineland Ave. to Tugunga Wash, River Mi. 36.32 to River Mi. 37.71—by Corps of Engineers, Los Angeles. 1-23

LOS ANGELES CO.—**V. D. Case Co.,** 850 E. Ocean Blvd., Long Beach—$191,190 for conc. and pile mooring platforms at Piers C and D, Naval Shipyard, Terminal Island—by Bureau of Yards & Docks, Washington, D. C. 1-1

LOS ANGELES CO.—**Franks Dredging Co.,** 260 California St., San Francisco, and **Guy F. Atkinson Co.,** 22233 So. Santa Fe Ave., Long Beach—$436,914 for hydraulic fill at Piers B and C, Long Beach Outer Harbor—by Board of Harbor Commissioners, Long Beach. 1-9

LOS ANGELES CO.—**United Construction Co.,** Box 1887, Long Beach—$2,261,056 for steel sheetpile bulkhead and other improvements to Piers B and C, Outer Harbor, Long Beach—by Board of Harbor Commissioners, Long Beach. 1-9

SACRAMENTO CO.—**T. & B. Construction Co.,** Box 1, Colma—$75,900 to clear overflow areas, Colusa Weir outlet channel and Sutter by-pass, Sacramento River, Sacramento—by Corps of Engineers, Sacramento. 1-23

SAN BERNARDINO CO.—**Geo. Herz & Co.,** Box 191, San Bernardino — $142,616 for constr. of gate structs. and control house, Lytle Creek Channel Intake located on Lytle Creek approx. 500 ft. north of Foothill Blvd.—by Corps of Engineers, Los Angeles. 1-23

SAN JOAQUIN CO.—**Olympian Dredging Co.,** 225 Market St., San Francisco—$224,316 for 372,000 cu. yd. of dredging Stockton Deep Water Channel and Mormon Channel, Stockton—by Corps of Engineers, Sacramento. 1-23

Oregon

LINCOLN CO. — **The Port of Astoria,** Astoria—$163,125 to dredge a channel 300 ft. wide and 3,500 ft. long, minimum depth of 20 ft. at mean lower low water, in Yaquina Bay—by Corps of Engineers, Portland. 1-16

MULTNOMAH CO. — **James & Yost, Inc.,** Portland—$159,887 for reposting of underpinning of municipal terminal No. 2, Portland — by Commission of Public Docks, Portland. 1-1

Dam . . .

California

SAN DIEGO CO.—**M. H. Golden Construction Co.,** 4835 Noel St., San Diego—$109,910 to strengthen San Dieguito Dam, in Rancho Santa Fe, approx. 7 mi. northeast of Solano Beach—by City Council, San Diego. 1-13

Nebraska

FURNAS CO.—**C. F. Lytle Co.,** Box 206, Sioux City, Iowa and **Amis Construction Co.,** Box 1871, Oklahoma City—$4,270,006 for Medicine Creek Dam, Frenchman-Cambridge Unit, and access road — by Bureau of Reclamation, Indianola. 1-22

South Dakota

CHARLES MIX CO. — **Western Contracting Corp.,** Benson Bldg., Sioux City, Iowa — $4,405,800 for excav. for outlet works and constr. of rolled embank. for Fort Randall Dam, Pickston—by Corps of Engineers, Omaha, Nebr. 1-20

Tunnel . . .

California

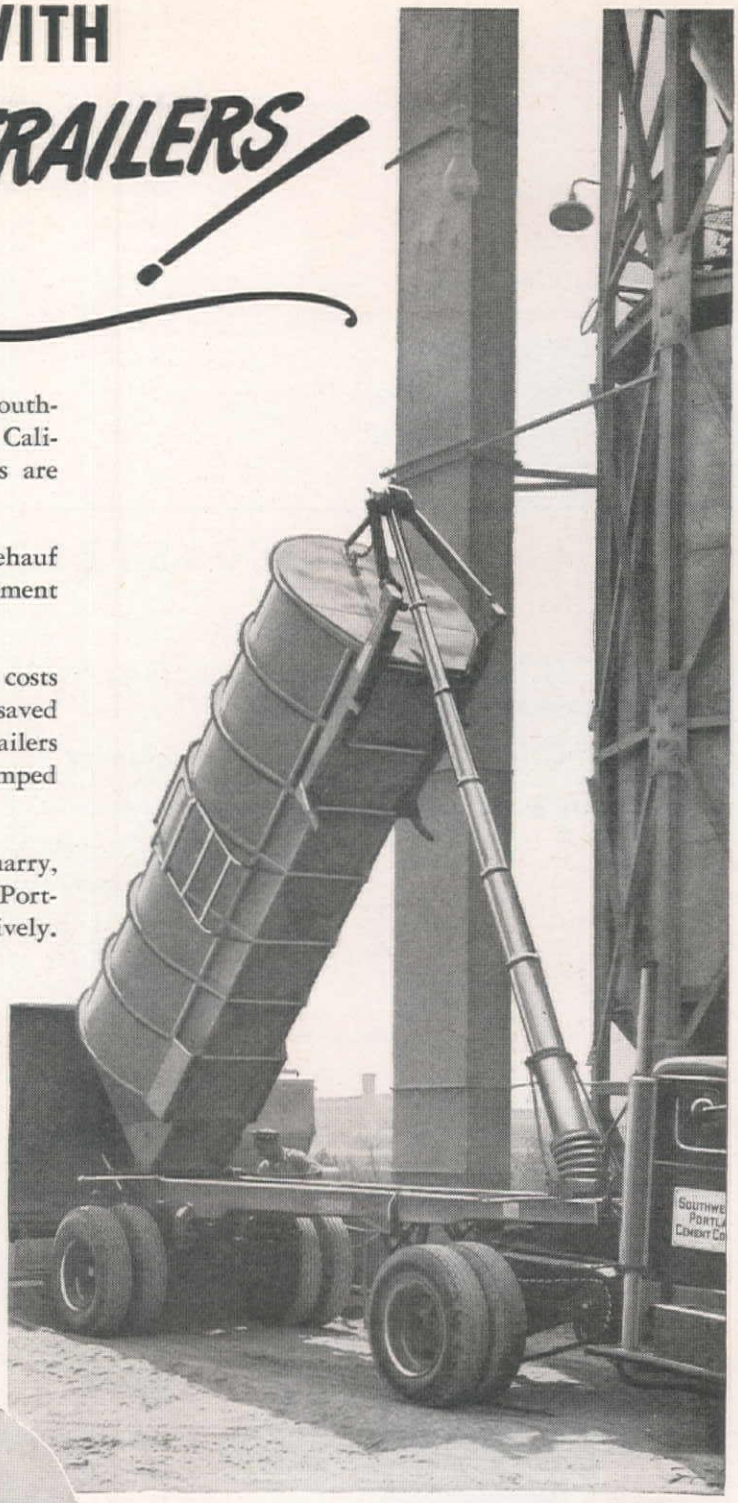
BUTTE CO.—**L. E. Dixon Co.,** 409 So. California St., San Gabriel and **Arundel Corp.,** Baltimore, Md.—will construct the Rock Creek tunnel, approx. 22,800 ft. long, 25 ft. in diam., horseshoe shape near Cresta, on the north fork of the Feather River, east of Oroville—by Pacific Gas & Electric Co., San Francisco. 1-16

Irrigation . . .

Oklahoma

JACKSON CO. — **Pannell Construction Co.,** Helena, Ark.—$288,730 for earthwork and structs., Ozark laterals 4.6 and 15.2,

NO SACKS NEEDED WITH BULK-CEMENT TRAILERS!



DELIVERIES of bulk cement from the plant of Southwest Portland Cement Company, Victorville, California, are made in Fruehauf Tank-Trailers. Sacks are not required. The result—costs are reduced.

By using two Fruehauf Semi-Trailers and a Fruehauf Converter Dolly, in combination, 115.4 barrels of cement are hauled as a single load.

In addition to the economy of bigger loads, sacking costs are eliminated and customers with silo storage are saved double handling charges. In this operation, the Trailers are loaded from hoppers at the mill and are dumped directly into customers' bins.

From the first haul of raw materials from the quarry, to the delivery of the finished product, Southwest Portland Cement Company uses Fruehauf Trailers exclusively.

Their fleet includes side-dump "Skips" for rock, Flatbeds for sacked and Tankers for bulk cement. Each highway unit averages 60,000 miles annually.

It is significant to note that more Trailers in the heavy hauling field bear the name "Fruehauf" than any other make. Each Fruehauf is engineered and built to make light work of your big loads. In the line, you'll find Dumpers, Tankers, Tilt-Decks and Low-Bed Models in most any capacity.

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY

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LOS ANGELES • SAN FRANCISCO • SACRAMENTO • PORTLAND
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"ENGINEERED TRANSPORTATION"

PLAIN HORSE SENSE
YOU CAN PULL FAR MORE THAN YOU CAN CARRY!

FRUEHAUF *Trailers*

and sublaterals, near Altus—by Bureau of Reclamation, Altus. 1-13

Oregon

JEFFERSON CO. — **Adler Construction Co.**, Box 1067, Redmond — $414,736 for earthwork and structs., laterals M-58 and M-61 and sublaterals, 1 to 11 mi. north and east of Madras—by Bureau of Reclamation, Bend. 1-9

Power . . .

California

SHASTA CO.—**Harms Bros.**, 5261 Stockton Blvd., Sacramento—$361,151 for 115-k.v. and 230-k.v. switchyards for Keswick Power Plant, approx. 4 mi. northwest of Redding—by Bureau of Reclamation, Redding. 1-7

Building . . .

Arizona

MARICOPA CO.—**E. W. Duhame**, 2250 E. Washington St., Phoenix—$217,000 for four-story, 10-room, reinf. conc. addition to warehouse bldg., 501 So. 3rd Ave., Phoenix—by Central Arizona Light & Power Co., Phoenix. 1-16

MARICOPA CO.—**Mardian Construction Co.**, Phoenix—$700,000 for 100 dwellings in North Central Heights subdivision, Phoenix—by self. 1-5

California

ALAMEDA CO.—**Barrett & Hilp**, 918 Harrison St., San Francisco—$400,000 for three-story, reinf. conc. factory and office bldg. at Fourth and Cedar Sts., Berkeley—by Pacific Paint & Varnish Co., Berkeley. 1-21

ALAMEDA CO. — **Donald Groom**, 1433 146th Ave., San Leandro—$2,000,000 for eight, three-story; seven, two-story; and garage bldgs. of frame and stucco, Alvingroom Court, Oakland—by self.

CONTRA COSTA CO.—**Carl Overaa & Co.**, 520 16th St., Richmond—$315,760 for reinf. conc., classroom and administration bldg., Broadway Elementary School, Baker St., San Pablo—by City School District, San Pablo. 1-19

CONTRA COSTA CO.—**Carl Overaa & Co.**, 520 16th St., Richmond—$200,000 general contract for alterations to warehouse in Richmond—by International Harvester Co., Chicago, Ill. 1-1

FRESNO CO.—**Franceschi Construction Co.**, Box 528, Fresno—$303,000 for classroom additions, dormitory bldg., vice principal's dwelling, Auberry-Tollhouse Rd.—by Board of Trustees, Joint Union High School District, Fresno. 1-28

KERN CO.—**Ashby & Oppermon**, 14th & F Sts., Bakersfield — $400,000 for community bldg., shop and swimming pool, grammar school, Bakersfield—by Board of Trustees, Lakeside Elementary School, Bakersfield. 1-22

LOS ANGELES CO.—**L. E. Dixon Co.**, 409 So. California St., San Gabriel—$400,000 for two-story, reinf. conc. store bldg. at 5570 Wilshire Blvd., Los Angeles—by Mullen & Bluett, Los Angeles. 1-23

LOS ANGELES CO.—**A. Gersten**, 942 So. La Brea Ave., Los Angeles—$1,700,000 for 196 two- and three-bedroom, stucco and siding dwellings on tract bounded by Whittier and Washington Blvds., Whittier—by J. Richard Co., Los Angeles. 1-23

LOS ANGELES CO.—**J. E. Haddock, Ltd.**, 3538 E. Foothill Blvd., Pasadena—$770,200 for 100 two -and three-bedroom pumice-crete dwellings on Phillips Blvd. and Hamilton Ave., Pomona—by Phillips Park Corp., Pomona. 1-16

LOS ANGELES CO.—**McNeil Construction Co.**, 5860 Avalon Blvd., Los Angeles—$1,000,000 for one- and part two-story department store bldg. at northwest corner of Sepulveda and La Tijera Blvds., Westchester District—by Los Angeles Extension Co., Los Angeles. 1-16

LOS ANGELES CO.—**Paul W. Trousdale**, 650 N. Sepulveda Blvd., Los Angeles—$1,867,300 for 180 six-room, frame and stucco dwellings in Venice District, Los Angeles—by Westdale Homes, Los Angeles. 1-23

NAPA CO.—**Moore & Roberts**, 693 Mission St., San Francisco—$1,887,777 general contract for Units 1 and 4, South Ward group at Napa State Hospital, Imola—by Division of Architecture, Sacramento. 1-22

SACRAMENTO CO.—**Central California Construction Co.**, 116 Erie St., San Francisco—$498,767 for reinf. conc., two-story bus terminal at Seventh and I Sts., Sacramento—by Pacific Greyhound Lines, San Francisco. 1-1

SANTA CLARA CO.—**Parker, Steffens & Pearce**, 135 So. Park St., San Francisco—$2,000,000 for one-story, struct. steel main factory bldg. and two-story, reinf. conc. office bldg., Monterey Rd., San Jose—by General Electric Co., San Francisco.

Colorado

DENVER CO.—**F. J. Kirchhof Construction Co.,** 700 Lawrence St., Denver—$400,000 for 63-bed, reinf. conc. and brick addition to north wing of hospital in Denver—by Board of Directors, St. Joseph's Hospital, Denver. 1-15

DENVER CO.—**Mead & Mount Construction Co.,** Denver National Bank Bldg., Denver — $422,000 general contract for Emily Griffith Opportunity School, 12th and Welton, Denver—by School District No. 1, Denver. 1-21

PUEBLO CO. — **Morgan Construction Co.,** Worcester, Mass.—$3,000,000 for construction of rod mill and wire drawing plant, Pueblo—by Colorado Fuel & Iron Corp., Denver. 1-21

Idaho

CANYON CO.—**Intermountain Builders, Inc.,** Caldwell and **Intermountain Plumbing Co.,** 1322 Grove St., Boise—$200,000 for three-story, brick veneer dormitory bldg., Simplet Hall, College of Idaho, Caldwell—by Board of Trustees, College of Idaho, Caldwell. 1-23

Texas

HOWARD CO.—**Robert E. McKee,** 1918 Texas St., El Paso—$5,712,739 for 250-bed hospital bldg., Big Spring—by Corps of Engineers, Albuquerque, N. Mex. 1-14

Utah

CACHE CO.—**Campion Construction Co.,** 1550 Capitol St., Ogden—$203,800 for shop bldg. and garage at Agricultural College, Logan—by State Building Board, Salt Lake City. 1-23

SALT LAKE CO.—**Olson Construction Co.,** Box 366, Salt Lake City—$175,000 for foundations of steel fabricating plant bldg. on 43-acre site southwest of Salt Lake City limits—by Chicago Bridge & Iron Co., Chicago, Ill. 1-16

Washington

JEFFERSON CO. — **S. S. Mullen Co.,** Ninth Ave. N., and Roy St., Seattle—will build a 60,000 sq. ft. steel reinf. bldg. to house conversion operations of mill at Port Townsend — by Crown Zellerbach Paper Co., Port Townsend. 1-2

KING CO. — **A. F. Mowat Construction Co.,** 2833 Eastlake, Seattle—$410,000 general contract for 1st Unit, reinf. conc. brick veneer part one- and two-story high school bldg., Bellevue — by Board of Trustees, Overlake High School District, Bellevue. 1-23

KING CO. — **Nettleton-Baldwin-Anderson, Inc.,** 1109 N. 36th St., Seattle—$3,000,000 for reinf. conc., 14-story apartment bldgs. (two) on block bounded by 8th Ave., Madison Ave., 9th Ave. and Spring St., Seattle—by self. 1-2

KING CO.—**Sound Construction & Engineering Co.,** 1403 W. 45th, Seattle — $350,000 for one-story, reinf. conc., sales and service department bldg. at Lane and Weller Sts. and 5th and 6th Aves., Seattle—by General Motors Corp., Seattle. 1-1

THURSTON CO.—**Kuney Johnson Co.,** 235 Ninth Ave. N., Seattle—$1,120,500 for mill, to include offices, bottling area, shipping platforms, Oregon St. and E. Marginal Way, Olympia — by Washington State Liquor Control Board, Olympia. 1-21

YAKIMA CO. — **General Construction Co.,** 3840 Iowa St., Seattle—$500,000 for three-story and basement, reinf. conc. tele-

phone exchange bldg., Yakima—by Pacific Telephone & Telegraph Co., Yakima. 1-9

Canada

BRITISH COLUMBIA—**S. P. Kirkpatrick,** 305 W. 16th Ave., Vancouver—$150,000 for two-story, frame and stucco apartment bldg. in 1000 block Harwood St., Vancouver—by Thomas Campbell, Vancouver. 1-16

BRITISH COLUMBIA—**G. H. Wheaton,** 1207 Douglas St., Victoria—$100,000 for reinf. conc. addition to plant at Victoria—by Sidney Roofing and Paper Company, Ltd., Victoria. 1-16

Miscellaneous . . .

California

KERN CO. — **United Swimming Pool Corp.,** 8730 Sunset Blvd., Los Angeles—$163,170 for reinf. conc. swimming pool and locker bldg., elementary school, Shafter—by Board of Education, Shafter. 1-2

Colorado

JEFFERSON AND DENVER COS.—**Latimer Construction Co.,** W. 9th Ave. and Wyandotte, Denver—$120,133 for median ditch and curbs and gutters for approx. 4.8 mi.—by State Highway Department, Denver. 1-13

Montana

JEFFERSON CO.—**Kiely Construction Co.,** Box 65, Butte—$153,131 for streets, water and sewer systems at Canyon Ferry Government Camp, Canyon Ferry Unit, Missouri Basin Project, about 11 mi. northeast of Clasoil—by Bureau of Reclamation, Helena. 1-13

PROPOSED PROJECTS

Dam . . .

California

RIVERSIDE CO.—Vail Co. of Los Angeles is taking bids on the construction of Vail Dam and appurtenances. The work involves building of a 140-ft. high concrete arch dam, containing approx. 22,660 cu. yds. of concrete. The dam will be located on Temecula Creek, approx. 12 mi. east of Temecula, at the head of Nigger Canyon.

Power . . .

Washington

GRANT CO.—The Bureau of Reclamation at Coulee Dam is calling bids to be due in the latter part of Feb. for the finishing of work at the power plant and switchyard at Grand Coulee Dam. The work is located approx. 30 mi. northeast of Odair. Work includes production of aggregates, completion of control bay, control cable tunnel, parking area and misc. finish for Grand Coulee right power plant and constr. of transformer circuits, tie circuits and right switchyard.

Building . . .

California

ALAMEDA CO.—The Berkeley Board of Education, Berkeley, Calif., is taking bids on the completion of an auditorium, including a little theater, broadcasting studio, drama classrooms, music rooms, art gallery and stage craft rooms at the Berkeley High School, Grove and Kittridge Sts., Berkeley. The estimated cost is $1,800,000. Bids are due on March 16.

SANTA CLARA CO.—The Jesuit Fathers are planning the construction of a Jesuit College in San Jose. The first unit to be constructed will be a 10-classroom bldg. and laboratory. The cost will be approx. $1,500,000. Future plans call for the building of more classrooms, laboratories, and student dormitories, chapel and an auditorium.

Idaho

TWIN FALLS CO.—Fisher & Fisher, Denver, Colo., architects, are preparing plans and specifications for the 150-bed Twin Falls County Hospital. The cost is estimated at $1,250,000, bids will be asked soon.

Oregon

MULTNOMAH CO.—Two nine-story buildings, to be known as the Town Apartments, each building to contain 41 apartments and two pent-houses are soon to be built in Portland. The cost of the project is to be more than $2,000,000. Bids will be asked shortly.

All-Welded Vertical Lift Span Replaces Barge Bridge

By V. R. Gorham, Vice President
Cleary Bros. Construction Co.
West Palm Beach, Florida

THE old floating barge that carried highway traffic of State Route 71 across the Intracoastal Waterway at White City, Florida, has been replaced by a modern all-welded steel lift bridge constructed by our company.

The new bridge is designed for H-15 loading and is supported on concrete piles and piers. The overall length is 235′.

A total of 98 reinforced-concrete piles, 18″ square x 44′ long, were cast and driven to form the piers under the towers and the two end bents. Driving of pier piles was done from a barge with a Northwest crane fitted out with leads, using a No. 1 Vulcan Steam Hammer. For steel erection, the crane was fitted with a 95′ boom.

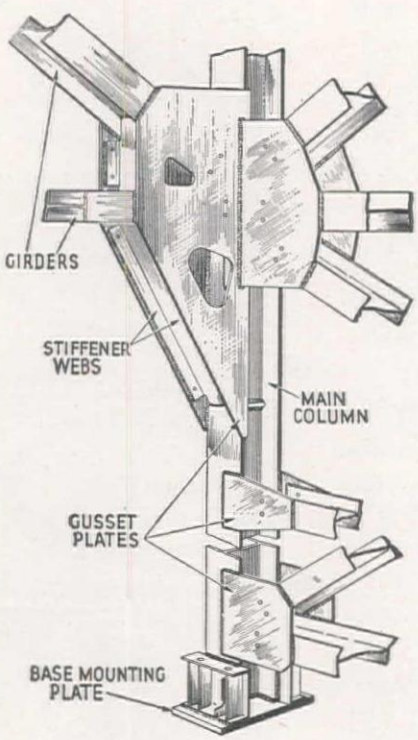


Fig. 1. Construction detail of main column at base foundation showing welded assembly of girders to column.

Fig. 2. Modern all-welded construction lift span bridge.

Pier forms were built of ¾″ sheeting with 2 x 6 studs on 16″ centers, and double 2 x 6 wales on 30″ centers for the average panels.

Steel for the towers and lift span was supplied by the Virginia Bridge Co. The two trusses for the 107′ lift span were already assembled when delivered, and the rest of the span welded together at the job site. Timber piles were driven in a nearby inlet, the span assembled and welded on this false-work, and then floated on two barges to its place in the bridge.

The trusses are 12′ 6″ high and are on 33′ 6″ centers. Near the bottom they are connected by 30″ 116-lb. I beams which are spaced 15′ apart and carry 14″ WF stringers. These stringers in turn support a 5″-thick concrete-filled steel deck grating.

The towers consist chiefly of 12″ WF 25 and 40-lb. beams. At the base each tower is 36′ 9″ wide x 28′ long. At the top the width is the same, but the slope on the back members cuts the length down to only 8′.

The weight of the lift span, including flooring and machinery, is 227,870 lbs. Theoretically the counterweights should have weighed half of this, or 113,935 lbs. each. Instead, the counterweights were made to weigh 109,940 lbs. each, with pockets for addition of balance blocks so the most efficient ratio could be worked out in actual tests.

"Fleetweld" electrodes and "Shield-Arc" welders, manufactured by The Lincoln Electric Company were used. The welders were of the engine-driven type with pneumatic tired running gear to provide easy portability.

The construction crew employed on the bridge averaged 23 men, consisting of a crane operator, 2 welders, 5 carpenters, 5 structural steel workers and 10 laborers. Had riveting been used, we would have required about 6 more men.

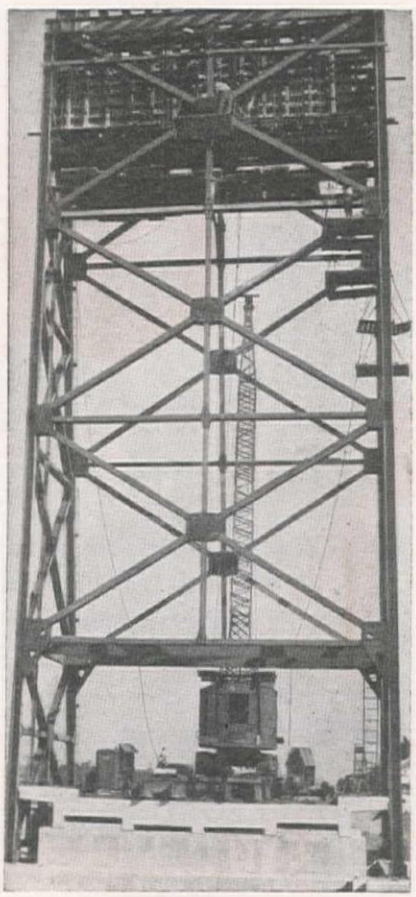


Fig. 3. All-welded steel tower assembled on concrete pier.

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

With the addition of **Harry Givens** to the staff as Associate District Manager, the jurisdiction of the West Coast office of CONSTRUCTION MACHINERY COMPANIES will be expanded to extend closer factory cooperation to distributors, dealers and users in California, Oregon, Washington, Idaho, Utah, Nevada, and Arizona. Givens has spent virtually his entire business life serving the users of construction and industrial equipment on the west coast. He will work out of the office in Los Angeles, Calif.

☆ ☆ ☆

Appointment of **Robert C. Dunbar** as West Coast representative of the AMERICAN HOIST & DERRICK COMPANY has been announced recently. He will represent the Small Products Division. Dunbar was formerly connected with the Steel and Tube Division of Republic Steel and more recently engaged in sales work on the West Coast. San Francisco, Calif., is the probable location of the new headquarters.

☆ ☆ ☆

E. P. Larson of the CELOTEX CORPORATION was elected president of the NORTHERN CALIFORNIA CHAPTER OF PRODUCERS' COUNCIL, INC., a national organization of manufacturers of building materials and equipment, at the January meeting in San Francisco. New vice-president is **J. A. Carlson** of the KRAFTILE COMPANY, Niles, Calif., secretary, **D. W. Lyon** of LIBBEY-OWENS-FORD GLASS CO., and treasurer, **W. J. Rawlings** of HARBOR PLYWOOD CORPORATION OF CALIFORNIA.

☆ ☆ ☆

Robert H. Fox has formed his own company to be known as the ROBERT H. FOX COMPANY, with offices in Van Nuys, Calif. The company will specialize in the engineering and sales of special off - the - highway trucks, cranes, shovels and crane carriages. It will also represent several Eastern manufacturers in the Western states. Fox has been with SIX WHEELS, INC., for the past seven years in the capacity of Sales Engineer.

☆ ☆ ☆

E. P. O'Connor has been promoted to assistant branch manager of the Minneapolis motor truck branch of the INTERNATIONAL HARVESTER COMPANY of Chicago. O'Connor, formerly retail truck manager at San Francisco, Calif., started his career with Harves er at St. Cloud, Minn., in 1933. **Marion Young**, formerly retail truck manager at Portland, Ore., has been made assistant manager of the Seattle motor truck branch, and **J. P. Feyen** has been promoted to assistant manager at the Spokane, Wash., branch. Feyen, formerly retail truck manager at Fresno, Calif., started with the company at Denver, Colo., in 1938.

☆ ☆ ☆

L. R. Alt, plant superintendent of the KRAFTILE COMPANY, Niles, Calif., manufacturers of structural clay products, has been appointed a vice-president of the organization in charge of production. Action of the Kraftile Board of Directors came in recognition of Alt's leadership in building up production during the past three years he has been with the company. Before coming to the Niles plant, Alt was affiliated with the Sioux City Brick and Tile Co., Sioux City, Ia. The move gives the Kraftile production department direct representation in policy matters.

☆ ☆ ☆

R. L. Minckler has been elected president of the GENERAL PETROLEUM CORPORATION, Los Angeles, Calif. Minckler succeeds **S. J. Dickey**, who retired on Jan. 1, 1948. **R. A. Sperry**, senior vice-president and a director of the concern, also retired on that date. Minckler was elected a General Petroleum Corporation vice-president in 1945, upon returning from wartime service as Director of Petroleum


PACIFIC
SUPER STEEL
PREFORMED
WIRE ROPE
PACIFIC WIRE ROPE COMPANY
LOS ANGELES 21, CALIF., U.S.A. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

Supply of the Petroleum Administration for War. In June of 1947 he was advanced to the position of executive vice-president. During the past year, he was one of three western oil men appointed by Secretary of the Interior Krug to the government's 15-man Military Petroleum Advisory Committee, whose function was to advise the Army and Navy on petroleum matters. He was also recently elected a member of the National Industrial Conference Board.

☆ ☆ ☆

The AIR REDUCTION COMPANY, New York, N. Y., has formed a new wholly owned subsidiary, to be called the AIR REDUCTION PACIFIC COMPANY, with headquarters in San Francisco, Calif. The new subsidiary will carry on all the business formerly conducted by the Air Reduction Sales Company in the Western region of the United States including the present San Francisco, Los Angeles, Portland and Seattle sales districts. **H. P. Etter,** formerly sales manager of the Pacific Coast Division will be president and director of the new company. The other directors will be **C. D'W. Gibson, G. E. Hawkins, J. A. Hill, C. G. Andrew** and **W. C. Keeley,** who will also serve as chairman of the board. Etter will make his headquarters in San Francisco.

☆ ☆ ☆

COAST EQUIPMENT COMPANY of San Francisco, Calif., announces that effective as of Oct. 15, 1947, that company has become a division of the NOSMAN EQUIPMENT COMPANY, a California corporation. The new corporation, of which **W. M. Nosman** is the president, will continue to carry on the company under the same firm name of Coast Equipment Company. The company, which distributes a wide range of construction equipment also announces its appointment as distributor in Northern California of Rex Construction Machinery, manufactured by the CHAIN BELT COMPANY of Milwaukee, Wisc. **Byron G. Walker** has been appointed as manager of the firm. Other new appointments include those of **Paul R. Elgi,** former sales manager, to the post of Assistant Manager, and **James C. Frush,** formerly of Industrial Equipment Co., as Sales Manager. Other additions to the sales department personnel, previously associated with Industrial Equipment Co., include **George R. Planz,** and **Gene Curry** with **Griff Squire** covering the Sacramento area, **Johnny Gillette** in the Marin and Mendocino coastal counties and **Johnny Quartarolo** in the Stockton area.

☆ ☆ ☆

PACIFIC NORTHWEST

STAR MACHINERY CO., Seattle equipment distributor, has opened a central Washington branch in Yakima to supply the counties east of the Cascades. **Paul Berner** has been assigned to the new office as manager with **Mark W. Whiteside** as his assistant.

☆ ☆ ☆

Don Meissner, formerly field engineer for the FAIRBANKS-MORSE CO., serving the Puget Sound industrial area, has joined the staff of the AMERICAN MACHINERY AND ELECTRIC CO. in Tacoma.

☆ ☆ ☆

I. K. Ackmann and **Bill Benston,** factory representatives for the INSLEY MANUFACTURING CORP., have been assigned to headquarters at the STAR MACHINERY CO. in Seattle. Ackmann, factory sales representative, has been with Insley for 10 yr., while Benston, service representative, joined Insley a year and a half ago after more than 10 yr. as an equipment operator with various contractors in the Northwest.

☆ ☆ ☆

W. D. "Pete" Haley has been appointed as district manager of the Pacific Northwest territory for the LIMA SHOVEL AND CRANE DIVISION of the LIMA-HAMILTON CORP., Lima, Ohio. Haley joined the Lima-Hamilton organization when the Seattle branch office was opened in 1930 and was appointed assistant district manager in 1945.

☆ ☆ ☆

W. D. Gray, founder of the CANADA ROOF PRODUCTS, LTD., at Vancouver, B. C., has resigned and will form a new company for the distribution of building materials and allied lines throughout western Canada. **A. W. Jones** has been appointed as the new manager of the Canada Roof company. Prior to and since the war he has been engaged in technical and sales work for an oil firm in Montreal, Fort William and Winnepeg.

☆ ☆ ☆

Roland Gilley has been made executive vice-president and managing director of EVANS, COLEMAN & GILLEY BROS., LTD. of Vancouver, New Westminster and Victoria, B. C. The appointment follows the resignation of **Byron I. Johnson,** former president and general manager of the company, who was recently appointed Premier of British Columbia.

Gordon Farrell has resumed his former position as president of the company.

☆ ☆ ☆

M. M. Newdall has been appointed Portland branch manager for the STANDARD OIL CO. OF CALIFORNIA. He succeeds **E. C. Grady** who has been transferred to Sacramento in a similar capacity. Newdall was branch manager at Coos Bay, Ore., before being transferred to Portland and has been with Standard for 25 yr.

☆ ☆ ☆

Clyde W. Summerville, associate of the late William Pigott in the management of the SEATTLE STEEL CO., has been elected president of the organization to fill the vacancy left by Mr. Pigott's death. Summerville has been executive vice-president and manager of Seattle Steel Co.

☆ ☆ ☆

W. O. Beeson, superintendent for the B. C. Builders, Baker, Ore., has purchased the BILT-RITE BLOCK CO. and B. C. BUILDERS interests formerly held by A. L. Barker.

☆ ☆ ☆

E. N. HALLGREN CO., Seattle, has been appointed Pacific Northwest sales representative for products of the AMERICAN CAST IRON PIPE CO., Birmingham, Ala. Hallgren will serve the states of Washington, Oregon and Idaho.

☆ ☆ ☆

H. B. Humphrey has been appointed district manager at Portland for the Fisk Division of the UNITED STATES RUBBER CO. Humphrey has been associated with the company since 1927, first as a salesman in the Los Angeles territory and later in the San Francisco Bay area where he has been assistant to the division manager since 1940.

☆ ☆ ☆

Robert R. Cotter, a recent civil engineering graduate of the University of Washington, has joined the staff of the CONCRETE PRODUCTS ASSOCIATION, Seattle, as assistant to **Cotton M. Howard,** managing engineer.

☆ ☆ ☆

SHELL OIL COMPANY is applying to establish a marine service station and distribution depot at Prince Rupert, B. C. The company's plant will comprise an 80-ft. dock, tank, car-loading racks, concrete flash wall and other units. The development is expected to take place near Port Edward, where the U. S. Army had its post during the war.

☆ ☆ ☆

Paul G. Hahn has succeeded **W. G. Perrow** as district manager for the LEHIGH PORTLAND CEMENT CO. in the Spokane area. Perrow retired on Dec. 1, after having served as district manager for Lehigh since January, 1918. Hahn has been assistant to Perrow for the past 25 yr.

☆ ☆ ☆

R. F. Griffith has been appointed district representative in Oregon for the WASHINGTON BRICK & LIME CO., and has established his headquarters in Portland. He succeeds **Glen Tidyman,** who has joined the staff of the COLUMBIA BRICK CO.

☆ ☆ ☆

EAGLE METALS CO., with headquarters at Seattle and branches at Spokane and Portland, has been appointed Pacific Northwest distributor for sheet aluminum manufactured by PERMA-

NENTE METALS CORP. Eagle will supply users with less-than-carload lots of aluminum utility sheets for sheet metal work and corrugated aluminum sheets for building purposes.

☆ ☆ ☆

Jack A. Ryan, formerly sales manager for the NORTHWESTERN PORTLAND CEMENT CO., Seattle, resigned from that position on Jan. 1.

☆ ☆ ☆

Charles Metcalfe has entered into partnership in KNEEN'S BUILDERS SUPPLIES at Nanaimo, British Columbia. He was for many years representative for Gypsum Lime and Alabastine Canada, Ltd., in British Columbia, particularly covering the Vancouver Island territory.

☆ ☆ ☆

HOWARD-COOPER CORP., Portland, expects to have completed by May of this year its new building at 60th and Glisan. **L. W. Gardner,** president of Howard-Cooper, announced that the new building will have 67,000 sq. ft. of space devoted to office, display, parts, and shop. Lines handled by the distributor include International Harvester, Adams, Iowa, Link-Belt, and Schramm.

☆ ☆ ☆

MARION POWER SHOVEL COMPANY of Marion, Ohio, is announcing the appointment of **Wm. F. Lanius** as sales representative at Portland, Ore., succeeding **Joseph Reed** who represented the company in that territory for the past seven years. Lanius was formerly an erecting engineer for Marion. His territory will consist of Washington, Oregon, Idaho and Montana.

☆ ☆ ☆

A. J. Wherity, parts manager for WOOD TRACTOR CO., Portland, for the past two years, has been promoted to assistant manager of the firm. During the war Wherity served as assistant superintendent of materials for the Kaiser Co. at the Swan Island shipyards.

☆ ☆ ☆

Appointment of **Charles Swanney** to the sales staff of GYPSUM LIME & ALABASTINE CANADA, LTD., has been recently announced. Swanney will take over the Greater Vancouver sales district, succeeding **Denis Taylor,** who has been transferred to Victoria, B. C., from which point he will cover Vancouver Island and the northern mainland territory.

☆ ☆ ☆

INTERMOUNTAIN

The THREE FORKS PORTLAND CEMENT CO. of Three Forks, Mont., has been consolidated, along with other subsidiaries into the IDEAL CEMENT CO. Cement products of the Three Forks plant will hereafter carry the Ideal brand.

☆ ☆ ☆

The O. S. STAPLEY COMPANY of Phoenix, Ariz., has been named as the exclusive distributor in the state of Arizona for BUFFALO-SPRINGFIELD ROLLER COMPANY of Springfield, Ohio. This representation is effective immediately.

☆ ☆ ☆

PUMICE PRODUCTS CO., Boise, has completed a new building block manufacturing plant to replace the structure destroyed by fire last September. **Tom C. Smith,** owner of the company, reports that

the new plant is capable of producing 3,000 pumice blocks per 8-hr. shift. The building is constructed of pumice blocks.

☆ ☆ ☆

PIONEER WHOLESALE SUPPLY COMPANY, 830 S. 4th, West, Salt Lake City, Utah, has been named Richkraft distributor for the states of Utah, Southeast Idaho and Western Wyoming. The complete line of Richkraft Building and Construction products will be handled by this company.

☆ ☆ ☆

SMITH ENGINEERING WORKS, Milwaukee, Wis., a manufacturer of Telsmith Crushers and Equipment for mines, quarries and gravel plants, announces the appointment of **Sam A. Madrid** as Western Representative. He will cover all of the states west of and including Montana, Wyoming, Colorado and New Mexico, and will assist Telsmith dealers with the sale of their equipment. Madrid is exceptionally well qualified for this new work, having had a good many years' experience with crushing equipment, particularly in the mining field. He is a member of the American Institute of Mining and Metallurgical Engineers.

☆ ☆ ☆

The BROWN INSTRUMENT COMPANY has expanded its sales and service activities in the Rocky Mountain area by establishing permanent sales and service representation at 400 Broadway, Denver, Colo., and 36½ W. Second South, Salt Lake City, Utah. **Donald Larcen** has been placed in charge of Denver industrial sales and **George Winslow**, formerly industrial service manager at Detroit, will handle similar duties in Salt Lake City, where he will work with **Eldon Richardson**, district manager. The Denver branch will cover Colorado, Wyoming and Western Nebraska. The Salt Lake City district will include Utah, Southern Idaho and Western Nevada.

☆ ☆ ☆

AMONG THE MANUFACTURERS

W. H. WILSON, left, appointed manager of the newly created wire rope sales department at the Peoria, Ill., plant of R. G. LeTOURNEAU, INC. Sales engineers M. R. KAHLE, standing, and A. J. BECKER are assisting Wilson. The department will handle sales of a full line of preformed and non-preformed wire rope under their trade name Tournarope.

Elected president of the PRODUCERS' COUNCIL, national organization of building products manufacturers, is **David S. Miller** of Lancaster, Pa., sales promotion manager of the Building Materials Division of the ARMSTRONG CORK CO. He succeeds **Tyler S. Rogers** of Toledo, Ohio. **F. L. Riggin, Jr.** of Port Huron, Mich., and **C. R. Raquet**, Detroit, Mich., were named as vice presidents of the association. Offices for the Producers' Council are in Washington, D. C.

☆ ☆ ☆

THE BUFFALO - SPRINGFIELD ROLLER COMPANY of Springfield, Ohio, announces the appointment of **Murray D. Shaffer** as Director of Sales and Research Consultant for the company. Shaffer resigned from his position as Director of the Ohio Department of Highways on Dec. 30, 1947, effective Jan. 31, 1948, in order to accept the new position.

☆ ☆ ☆

Harvey A. Scribner, president of RUSSELL T. GRAY, INC., Chicago industrial advertising agency, has been appointed chairman of the 1948 Road Show Promotion Committee by the American Road Builders' Association. The show will be held in Chicago on July 16-24, at Soldiers Field, where road building and construction machinery manufacturers will exhibit equipment.

☆ ☆ ☆

Gordon Lefebvre, president of the COOPER - BESSEMER CORP., was elected the new president of DIESEL ENGINE MANUFACTURERS ASSOCIATION, at the Association's annual meeting, held Dec. 10, 1947, in Chicago. **Otto H. Fischer**, president of the UNION DIESEL ENGINE CO., and **L. W. Metzger**, vice-president of the BALDWIN LOCOMOTIVE WORKS, were elected new vice-presidents of DEMA. **Robert H. Morse, Jr.**, vice-president and general sales

manager of FAIRBANKS, MORSE & CO., was re-elected treasurer, and **Harvey T. Hill** was reappointed executive director.

☆ ☆ ☆

A new exploration and production research laboratory in Houston, Texas, has been dedicated by the SHELL OIL CO. The laboratory houses the latest types of research apparatus and a large staff of scientists devoted to finding better ways of locating new crude oil reserves and more efficient means of producing oil from existing sources. The new research unit both consolidates and expands Shell's research activities in this field.

☆ ☆ ☆

Vice Admiral George F. Hussey, Jr., USN (Ret.), wartime Chief of the Navy's Bureau of Ordnance, joined the staff of the AMERICAN STANDARDS ASSOCIATION and at the first of this year assumed the duties as administrative head of that organization. In this capacity Admiral Hussey will continue to serve the nation by directing the cooperative efforts of industry, consumers and government in the vital problem of standardization. **Cyril Ainsworth,** who for a number of years has been in charge of the technical activities of the ASA, will serve with Hussey as director of operations of the association staff.

☆ ☆ ☆

Arthur P. Van Gelder, one of the most widely known figures in the American explosives industry, died on Dec. 10, 1947 at the Delaware Hospital. Mr. Van Gelder with **Hugh Schlatter** was the author of the "History of the Explosives Industry in America," considered by explosives men to be the authoritative bible of names, dates, and places in the industry. He was born at Catskill, N. Y., in 1873. He attended high school there and later graduated from the School of Mines of Columbia University. His experience in the explosives industry covered many years and many companies. When he retired from active service in the explosives industry in 1921, Mr. Van Gelder was general superintendent of high explosives of HERCULES POWDER COMPANY of Wilmington, Del.

☆ ☆ ☆

Henry V. Erben of Schenectady, has been elected a vice-president of the GENERAL ELECTRIC COMPANY and on Jan. 1, 1948 became general manager of the Apparatus Department. He succeeds **Roy C. Muir,** company vice-president who is retiring after more than 42 years of service. **John D. Lockton,** of Schenectady has been elected treasurer of the company, succeeding **Jesse W. Lewis,** of New York, who retires after 37 years of service. Erben is a commercial vice-president and assistant general manager of the Apparatus Department and Lockton is an assistant treasurer.

☆ ☆ ☆

Mark A. Clements has been appointed General Service Manager of CATERPILLAR TRACTOR CO., to succeed **D. O. Nash,** who has resigned to serve as vice-president and general manager of the WORTHAM MACHINERY CO., Caterpillar distributor with headquarters in Cheyenne, Wyo. Clements, who has been Western Division Service Manager with headquarters at the San Leandro, Calif., Caterpillar plant, has been with the company since 1936. **J. Dean Uhll,** who has been Central Division Service Manager, will succeed Clements at San Leandro. Succeeding Uhll as Central Division Service Manager is **Ellsworth M. Iverson,** who joined the company in 1937. His former post as Service Engineer is being filled by **T. M. Fahnestock,** a mechanical engineer.

☆ ☆ ☆

Percy S. Gough has been made Manager of the Distributor Sales Division of AMERICAN HOIST AND DERRICK CO., Saint Paul, Minn. Gough, an eleven year veteran with the company, will direct sales and merchandising for his division through the company's world-wide sales organization.

☆ ☆ ☆

G. E. Tenney has been appointed Service Manager of THE LINCOLN ELECTRIC COMPANY of Cleveland, Ohio, to direct the policies and operations of a newly expanded Service Department. To the task of creating an organization to handle the servicing of Lincoln equipment on a national scale, Tenney brings the experience of fifteen years as District Manager for the Lincoln Chicago office.

☆ ☆ ☆

W. E. Day has been appointed as director of research for the MACK-INTERNATIONAL MOTOR TRUCK CORP. In assuming his new duties, he relinquishes the post of chief metallurgist for Mack, as well as that of general foundry superintendent. Day's contributions to Mack and to the industry as a whole have been numerous. Several of the aluminum, chromium and copper alloys for which he was largely responsible in his early career are still in use. He set up Mack's first chemical laboratory for checking materials, out of which evolved the company's present-day

chemical and metallurgical laboratories, which are among the best equipped and most elaborate in the automotive industry.

☆ ☆ ☆

R. E. Keidel has recently joined the Advertising Department of THE EUCLID ROAD MACHINERY COMPANY as Assistant Advertising Manager. Since his discharge from the Army Air Corps, Keidel has been engaged in industrial advertising and prior to joining Euclid was Assistant Advertising Manager of the Tremco Manufacturing Co.

☆ ☆ ☆

HERCULES POWDER COMPANY has announced the appointment of **L. C. LeBron** as assistant manager of its Explosives Department's Contractors Division in Wilmington, Del. LeBron joined Hercules on May 1, 1927 and remained with the company until World War II, when he became a member of the U. S. Army Ordnance Department. At the time of his discharge he held the rank of lieutenant colonel.

☆ ☆ ☆

C. W. Pendock has resigned as president of the LE ROI COMPANY, Milwaukee, Wis. **E. A. Longenecker,** who has been president of the Lauson Division of Hart-Carter Company, was suggested by Pendock and was elected as his successor by the board of directors. Pendock was elected to the position of chairman of the board. He had been the only president in the company's history, and sparked its growth from a small machine tool shop in 1914 to one of the industry's leading manufacturers.

☆ ☆ ☆

In connection with an expanded engineering program and the creation of new facilities for research and development, **D. O. Thomas,** president, has announced the appointment of **Stephen Johnson, Jr.,** as Chief Engineer of BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE CO., Elyria, Ohio. Johnson, with the company since 1923, has experience in the manufacturing and engineering phase of the business and has filled the position of assistant sales manager as well. The company is doing research to develop new applications for air controls in connection with the machine tool industry and with cranes, shovels, and other off-the-road machinery.

☆ ☆ ☆

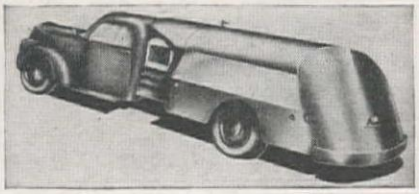
Hugh Comer, president and treasurer of Avondale Mills, Sylacauga, Ala., and chairman of the board of Boaz Mills, Inc., Boaz, Ala., has been elected to the board of directors of ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis. Comer replaces **John H. Collier,** chairman of the board for the Crane Co. of Chicago, who resigned because of ill health.

☆ ☆ ☆

A proposal to change the name of the FIBRE CONDUIT COMPANY, makers of Orangeburg pipe and conduit, to the ORANGEBURG MANUFACTURING CO., INC., New York, has been approved by the stockholders. The company was founded in 1893, to manufacture fibre conduit used underground as a raceway or distribution duct for electric power and communication cables. Later, a similar product for underfloor electrical distribution raceways was added. In 1943, the company introduced a fibre sewer pipe for use in house-to-sewer connections, and since that date, has increased its production by 50 per cent. A $1,500,000 expansion program at the Orangeburg plant was completed early in 1947.

NEW EQUIPMENT

More complete information on any of the new products or equipment briefly described on these pages may be had by sending your request to the Advertising Manager, Western Construction News, 503 Market Street, San Francisco 5, Calif.



Street Flusher

Manufacturer: Rosco Manufacturing Co., Minneapolis, Minn.

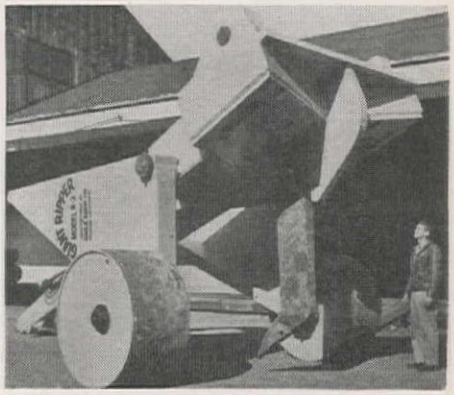
Equipment: Streamlined, truck-mounted flusher.

Features claimed: The modern attractive flusher includes such features as one master directional flow control valve which controls one or all flushing nozzles, larger pump and engine capacity, more flushing pressure at the nozzles, and durability features to insure long trouble-free operation. The tank weight is equally distributed through use of longitudinal sills over the entire truck frame. Wrought steel piping is used throughout. In addition to the high pressure flushing of streets, the unit can be used to fight fires, clean sewers, spray trees and shrubs, and pump out basements. It is built in 1200, 1600, and 2000 gal. capacities.

Giant Ripper

Manufacturer: Soulé Equipment Co., Oakland, Calif.

Equipment: Ripper strong enough to penetrate 6 ft. of hard ground.



Features claimed: The new 17-ton custom built ripper can take the pull of three to four 104 to 150 h.p. tractors. It is recommended for deep-penetration ground breaking ahead of ditchers on pipe line or cable laying jobs. It also may be used to reduce the need for blasting on excavating operations. It operates with one, two or three rooter shanks.

Masonry Water Repellant

Manufacturer: Protection Products Mfg. Co., Kalamazoo, Mich.

Equipment: Water repellant that penetrates into masonry.

Features claimed: The repellant will not wash away or evaporate from the material it is applied to because it has struck itself into the concrete or masonry and become a part of it. It works its way into the little channels in masonry and spreads a protective film of solid matter that repels water. Permanent protection is given against moisture and water, water seepage in basements, wall discoloration, masonry disintegration, dusting of cement floors, efflorescence, and other deleterious effects of water on masonry.

Lightweight Excavator

Manufacturer: Osgood Co., Marion, Ohio.

Equipment: New addition to the ⅜-cu. yd. excavator and material handling class.

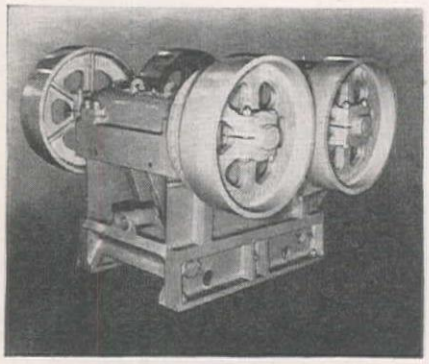
Features claimed: The new shovel is designed for jobs that are not profitable for the larger size excavators but are excellent for the right size shovel. It is readily interchangeable from one class of service to another. All main operating machinery is positioned on a welded deck, proportioned properly to take all strains and stresses set up in operation. It may be powered with either gasoline or Diesel engine. All operating controls are grouped together and in front of the operator. Cab is de-

signed to give the operator full view of his work. The new type rope crowding mechanism, arranged to give a direct positive independent crowding action, allows shallow cuts and holding to grade.

Jaw Crusher

Manufacturer: Iowa Manufacturing Co., Cedar Rapids, Iowa.

Equipment: Crusher with two movable jaws.

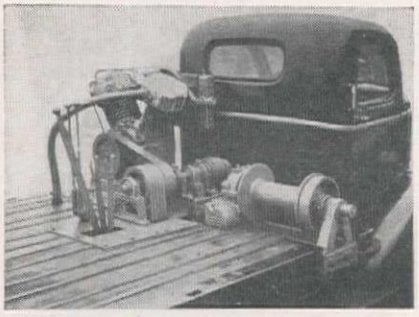


Features claimed: The twin jaws are operated by two eccentric shafts and a double set of flywheels. This arrangement provides greatly increased capacity and smoother operation because of the nearly 100 per cent balanced rotary motion. The twin jaw crusher can be used to do the work of a regular jaw crusher and a roll crusher. It is especially suited for installation in portable plants because of the reduction in drives and savings of space by combining lengths, heights and widths of two crushers into one.

Truck-Mounted Compressor-Winch

Manufacturer: Davey Compressor Co., Kent, Ohio.

Equipment: Compressor and winch powered by take-off from truck's drive-shaft.



Features claimed: The compressor delivers 105 cu. ft. per min. at 100 lb. pressure. Winch is of 25,000 lb. capacity. Countershaft with two individual clutches provides for either simultaneous or separate operation of compressor and winch. Air receiver and double hose reels are mounted beneath the truck platform, effecting substantial space savings. The unit extends only 40 in. behind the truck cab, leaving ample space for the transportation of men, tools and materials.

Heavy Duty Transmission

Manufacturer: Fuller Manufacturing Co., Kalamazoo, Mich.

Equipment: Three-speed auxiliary transmission for rigging and winch work.

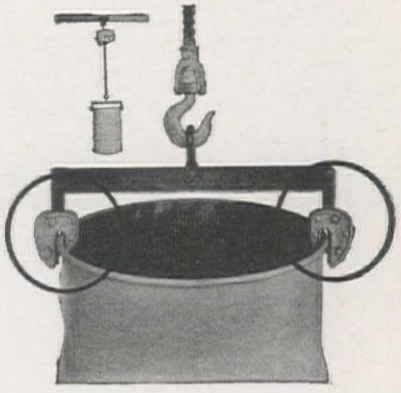
Features claimed: The transmission offers in a single unit all of the advantages normally provided by the use of auxiliary

transmissions with top-mounted power take-off, and at the same time eliminates the inherent weaknesses of this combination. For rigidity and strength, the power take-off gears and shaft are built directly into the transmission case where the section of the casting will permit the application of full engine torque. A reverse ratio is provided which permits a range of reverse power take-off ratios equal to the number of forward speeds in the unit mounted transmission.

Barrel Lifter

Manufacturer: Merrill Brothers, Maspeth, N. Y.

Equipment Dual clamp for lifting metal barrels.

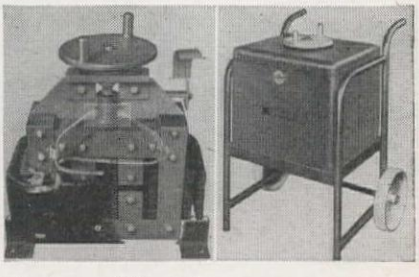


Features claimed: Metal barrels can be lifted straight up rather than by the old method of lifting at an angle by gripping and raising from one side. The device consists of a cross arm the width of the standard barrel with a clamp attached to both ends of the arm. The center of the cross bar is provided with a ring through which the hook of the hoist or other lifting media is attached. The clamps can be instantaneously attached and detached to and from the barrel. The heavier the load, the tighter is the grip.

Arc Welders

Manufacturer: John A. Kern Co., Chicago, Ill.

Equipment: Line of compact industrial AC welders.

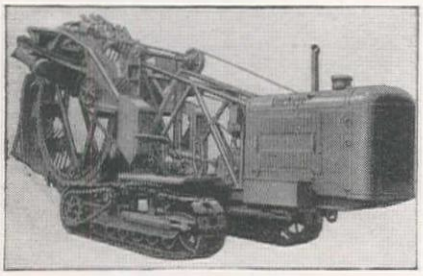


Features claimed: Compactness to an unusual degree is due to the fact that the movable core of all models travels less than 1 in. to cover the entire range of stepless amperage control. The arrangement of dual primary and secondary coils and the elimination of arc boosters, reactor coils and fans also contributes to compactness. Patented electrical and magnetic circuits which result in an instant starting are at all amperage settings. The design also produces high power factor, reduces "no-load" losses and results in high efficiency. The absence of rotary parts results in quiet operation and virtually eliminates the need for lubrication and maintenance. Models are rated from 130 to 400 amps.

Ditcher

Manufacturer: Gar Wood Industries, Inc., Findlay, Ohio.

Equipment: Ditcher for utility and municipal work.



Features claimed: The new ditcher cuts ditches 16 to 30 in. wide depending upon the bucket used, and up to 6 ft. deep. The digging wheel is supported by a rugged frame made of tubular members; a design which has proved its advantages in aircraft construction. The new model is several inches shorter and 500 lb. lighter than the previous model. Its Diesel engine develops 67 h.p. at 1,600 r.p.m. A fluid coupling in conjunction with a friction clutch permits loads to be picked up or relieved with either or both. Digging speeds up to 57.5 ft. per min. are provided. The ditcher has four forward and four reverse road speeds.

A-C Generator

Manufacturer: Electric Machinery Mfg. Co., Minneapolis, Minn.

Equipment: Generator with built-in automatic voltage regulating circuit.

Features claimed: The compact, factory-assembled unit includes revolving-field generator, direct-connected exciter, automatic voltage regulating circuit, meters, and selector switch for pre-setting voltage. The only external connections needed are leads to a generator switch. The built-in automatic regulating circuit has no moving parts and requires no maintenance. It is permanently connected and factory-adjusted to hold terminal voltage within two per cent of the voltage selected, at any load or power factor within the generator rating.

Pavers

Manufacturer: Chain Belt Co., Milwaukee, Wis.

Equipment: Hydraulically controlled pavers.

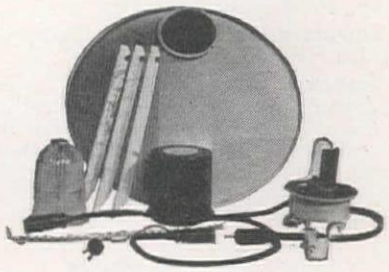
Features claimed: Hydraulic controls permit the operator to sit comfortably and operate the paver at top speed all day long. Operation is completely automatic. Hydraulic controls combine the timing of the batch with the timing of the complete paving cycle. It automatically starts the discharge, starts the skip, turns on the water, turns it off, closes the discharge chute, and operates the transfer on the double drum design. The operator thus has more time to lower the skip, spread the batch, or move the paver. A smart streamlined shielding houses the entire paver body. The shielding is designed as protection for all working parts and offers great ease of accessibility to working parts through large, easily operated doors.

Runway Lighting Equipment

Manufacturer: American Gas Accumulator Co. jointly with General Electric Co., Schenectady, N. Y.

Equipment: Compact kit containing all components necessary for lighting runways from 1,800 to 7,000 ft.

Features claimed: Included in the kit are Type IL insulating transformers, an easily-installed control cabinet, direct burial-type cables cut to required lengths, elevated runway markers, and threshold, taxiway and obstruction lights. The control cabinet contains a constant-current regulator, runway brightness and selector controls, and protector relays. The system is easy to install because every connection from the power receptacle all the way through to the lamps is plugged in through the use of



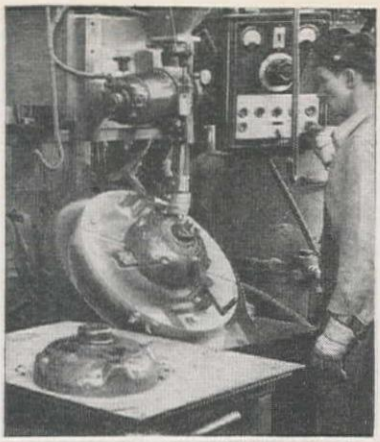
waterproof moulded rubber plugs. Lights are of the elevated type. The main beams provide more than 1,000 candle-power. The entire package is built to CAA specifications.

Welding Equipment

Manufacturer: Westinghouse Electric Corp., Pittsburgh, Pa.

Equipment: Single package of everything needed for automatic welding.

Features claimed: Welding head, control equipment, welding transformer and work positioning equipment are all included in the single package. The standard weldomatic head operates with a capacity of 1200 amperes AC. Special nozzles are available for 2000 amperes AC. Capacity for DC welding is 800 amperes. The head is so designed that it can be rotated 360 deg. in the vertical or horizontal plane. The motor-generator set is driven by a 2 h.p., 220/440-volt, 3-phase, 60-cycle AC motor. Control relays and contactors required in the operating circuit are mounted in the control panels. Control equipment for starting and stopping the welding arc and traverse mechanism, as well as adjustment for arc length, is mounted on the operator's panel.



Goggles

Manufacturer: Watchemoket Optical Co., Providence, R. I.

Equipment: Eye protection for workers who wear glasses.

Features claimed: The new goggles are

designed to fit comfortably over all types of glasses, even the widest safety spectacles. The sturdy frame is molded to withstand heavy impact. An extra large bridge-size

provides universal fit, comfortable for day-long wear. Shatterproof plastic lenses exceed Federal specifications for impact-resisting goggles. Frame or lenses are interchangeable. Light weight of the goggle encourages worker cooperation in an eye-safety program.

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.

METAL PROTECTION — **The Arco Company** of Cleveland, Ohio, has just released a 12-page, illustrated booklet, the theme of which is how to secure "Lasting Protection for Metal Surfaces." It presents comprehensive data on Dum Dum for Metal, the new tough but pliable and elastic water-repellent coating developed by Arco to protect metal structures against deterioration due to outdoor exposure. Properties, advantages, typical uses and application directions are included.

SPEED FORMS — **Irvington Form & Tank Corporation,** Irvington, N. Y., has issued a 4-page color bulletin cataloging and illustrating Atlas speed forms and their use for every purpose. On the last page is the alphabetical listing of pertinent facts which the company has termed "A Dictionary of Concrete Forms."

MALLEABLE FITTINGS — **Stanley G. Flagg & Co., Inc.,** of Philadelphia, Pa., has released an attractive two-color, 16-page booklet discussing "Malleable Fittings for Brazed Joints." Editorially described are such points as threadless malleable fitting for one-piece piping systems, general application, simplifying any piping layout, ease of making a Flagg-Flow joint. Several pages are given over to tables of list prices and sizes of the various fittings. On-the-job photographs and cutaway drawings add to reader interest.

BATCHING PLANTS — **Noble Company** of Oakland, Calif., has sent off the press four illustrated four-page folders describing the advantages and giving condensed specifications of Noble batching plants. A separate folder is devoted to each of the four plant sizes: 80, 100, 150, and 350 tons. Plan drawings and photographs of field installations are included for each model. Special features of all models include the Noble principle of weigh batching with central cement compartment; one-man operation; portability, and flexibility of setup.

CONCRETE COAT — **Sika Chemical Corp.,** Passaic, N. J. has issued two separate pamphlets discussing and illustrating the development of Sika Seal, a protective

coating claimed to have excellent adhesion to wet or dry surfaces. One pamphlet is intended particularly for architects and engineers and the other for contractors and maintenance engineers. Sika also has available an attractive pamphlet that presents, in condensed form, solutions to various problems encountered in new construction and maintenance work.

NAILOCK METHOD — **Sanymetal Products Co., Inc.,** Cleveland, Ohio, published a new catalog describing the Nailock Method of suspended ceiling construction which provides a means of mechanical fastening for acoustical ceiling materials. The catalog illustrates the four basic methods of use of Nailock Universal Nailing Channels which may be attached to carrying members by a saddle wire tie, spring lock clip, lath welded, or imbedded in concrete. Detailed descriptions accompanied by illustrations show how the channels are installed. Specifications, load tests and a list of distributors are other features of this 12-page, three-color catalog.

CENTRIFUGAL PUMP—**Byron Jackson Company** of Los Angeles, Calif., describes, in its new bulletin, the Hydroplex Pump, a split case multi-stage centrifugal pump for low capacity and high pressure pumping. The eight pages in two colors cover various views of the Hydroplex, cross-section schematic, sub-assemblies, parts and dimensional orthographic drawings, and also installation photographs. The Hydroplex is a smaller and more economical version of the BJ Hydropress, and presents various advantages over the complex displacement type pump.

HEX NUTS—**Elastic Stop Nut Corporation of America,** New York City, N. Y., is releasing a new series of Product Information Folders. The first three of these folders describing Machine Screw, Lightweight and Heavyweight ESNA Elastic Stop Nuts are now available. Each pamphlet features hex nuts in regular height and thin height types. Part numbers and weights are shown for all types and sizes, and wherever Army and Navy aeronautical equivalent part numbers exist, they are also shown.

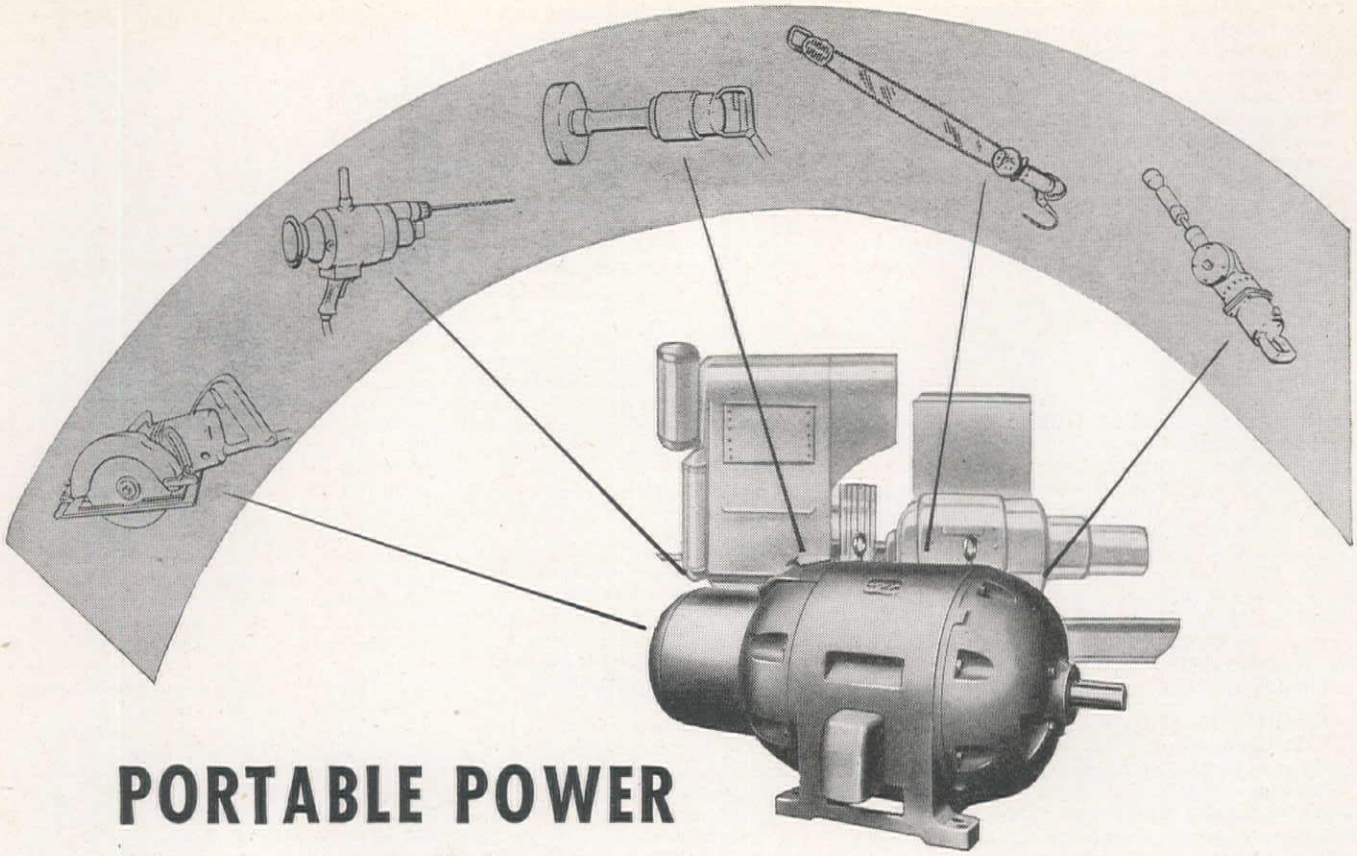
THE CHANGING WORLD — **The Power Crane and Shovel Association,** New York City, N. Y., recently has completed a color strip slide film entitled "The Changing World" which comprises the functional design of Power Cranes and Shovels, their application to construction jobs and job analysis. This film may be secured for loan free-of-charge by writing to the Power Crane and Shovel Association. A 40-page technical bulletin giving illustrations in black and white and accompanying descriptive matter which is an exact and complete reproduction of the slide film is available. 50 cents per copy is required to obtain the booklet.

ROOF SUPPORTS — **Unit Structures, Inc.,** Peshtigo, Wisc., has released a 12-page catalog illustrating and describing a complete line of glued-laminated arches, trusses, beams, and rafters used as roof supports for all types of buildings requiring a clear span from 20 ft. to 200 ft. wide. The catalog contains complete specifications and design data.

NEW INDUSTRIAL WEST — **The United States Steel Corporation,** Pittsburgh, Pa., has published a 24-page booklet entitled "The New Industrial West . . . a report by U. S. Steel." This booklet is fundamentally a progress report on the stewardship of United States Steel since its purchase of the wartime steel plant at Geneva, Utah, from the Government on June 19, 1946, and on industrial developments in the Western States which have followed that purchase. This progress report discusses United States Steel's past and present part in the remarkable industrial growth of the West. Action and location photographs amplify the text.

PICKING A PLANT SITE — **The Humboldt County Chamber of Commerce,** Eureka, Calif., has recently issued a 32-page booklet of graphic and factual information about the Humboldt Bay Area of northern California. The book is entitled "Picking A Plant Site—Where Nature Pays You An Extra Dividend." A happy combination of "eye appeal" and interesting facts, the new booklet presents forthrightly the advantages of industrial enterprises amid a recreational Empire of vast natural resources —46 billion feet of standing timber within the country with an annual lumber production of over 500 million feet; 60% of the world's supply of Redwood; the major harbor between San Francisco and the mouth of the Columbia; a rapidly expanding commercial fishing industry; an important dairy industry and numerous other industries already established. An attractive five color broadside displaying graphically the Humboldt Bay Area has also been issued as a companion piece to "Picking A Plant Site."

SYNTHETIC RESINS — **Hercules Powder Company** of Wilmington, Delaware, has made available a new 24-page technical booklet which for the first time includes a description of the properties and uses of all Hercules synthetic resins. Syn-



PORTABLE POWER for portable tools

Gas- or Diesel-driven Generators Work Long Hours in any Location with Minimum Maintenance

Muscle-saving, time-conserving power tools are multiplying like rabbits these days. Why? Because they increase labor's productivity, speed construction and raise profit margins.

ELECTRIFIED CONSTRUCTION
BETTER PRODUCT
LOWER COST

To keep these tools sawing, grinding, drilling, tamping and sanding you'll need reliable, low-cost power such as derived from General Electric gas- or diesel-driven generators. The generating unit should be lightweight and easily portable so as not to limit the portability of the tools. Automatic regulating characteristics of G-E generators allow you to work right up to the load limit without watching instruments or risking damage to the generator. Many years of research and experience go into each piece of General Electric equipment you buy.

For these reasons we believe you will profit by specifying G-E on your next portable power plant. Make use of all the portable tools available which fit your operation, and be sure the heart of your power system bears the General Electric name. *Apparatus Department, General Electric Co., Schenectady 5, N. Y.*

GENERAL ELECTRIC
655-64

thetic resins, most of which are rosin-base, have found application in a wide number of industries including protective coatings, adhesives, printing inks, paper and textile sizes, linoleum and floor tile, and essential oils and fixatives. A key to specific uses for Hercules synthetic resins is provided on pages 10 and 11 of the book by a chart which matches the resins with actual and potential uses. Brief descriptions of the following groups of resins are included in the book: Methyl esters of Rosin; the Cellolyns, first group of synthetic resins designed primarily for cellulosic lacquers; Ester Gums; Flexalyn Resins, glycol esters of rosin; the Lewisols, a series of rosin maleates; the Pentalyn series of pentaerythritol resins; Petrex Rexins; Poly Pale Esters; Staybelite Esters.

VELOCITY POWER DRIVER — **Mine Safety Appliances Co.**, Pittsburgh, Pa., has published a color leaflet describing the details of operation of the Velocity-Power Driver Model B which anchors pipe hangers and conduit boxes to structural plate or concrete. This 4½ pound tool utilizing the discharge of a blank cartridge as its only source of power was introduced at the National Metal Trades Congress in the latter part of 1947. Photographs of the driver in action and pictures of its various parts amplify the text.

MODERN FINANCING METHODS —**C. I. T. Corporation,** New York, N. Y., has published a new color booklet covering the financing of machinery and arranging of loans for plant expansion and modernization. Case histories presenting problems of contractors, company owners and manufacturers and the successful solutions reached by arranging for financing through C. I. T. are to be found throughout the book. Some of the subjects discussed are: Financing Purchases of Machinery and Industrial Equipment; Collateral Loans to Provide Working Capital; and Using C. I. T. Financing in your business.

HISTORY OF EXCAVATION—**Bucyrus-Erie Company** of South Milwaukee, Wis., has published the fourth in a series of booklets illustrating the importance of earthmoving machinery in the growth of our civilization. Since the war dramatically highlighted the performance of earthmoving tools, their role in a fighting economy was stressed in the previous booklets. This fourth one deals with the long term history and development of excavation and the part Bucyrus has played in that development. The 68-page five-color booklet is illustrated with action photographs of Bucyrus machines in use the world over. The five plants are photographed and described as well as safety measures used for employee protection. The last section of the book deals with the management of the company.

CONVEYOR CATALOG — **The Jeffrey Manufacturing Co.**, Columbus, Ohio, has published a 168-page catalog which is virtually a handbook on the subject of belt conveyors. Many conveyor problems can be answered by using a standard conveyor and this catalog provides a complete selection of Jeffrey Standardized Units. These standardized units have been so indexed and classified that by referring to the proper tables it is easy to determine the correct conveyor to suit a given need. There is also listed a complete line of anti-friction idlers in cast iron or steel, to meet any service requirement. All other necessary equipment usually required in the application of belt conveyors, such as belting, trippers, take-ups, and power transmission machinery is also listed. Photographs, cutaway drawings and specification charts amplify the text.

POINTED FACTS—**Griffin Wellpoint Corporation,** New York, N. Y., has published a 74-page booklet titled "Griffin Pointed Wellpoint Facts." Photographs and line drawings in this booklet describe typical wellpoint layouts and case histories. Griffin Units and various assemblies are also illustrated. Several pages are devoted to jetting pumps because the smaller pressure pumps are necessary to install the wellpoints. The larger units are used for jetting piles, sheeting, caissons and other jetting purposes.

SAWS CUT COSTS — **Chicago Saw Works,** Chicago, Ill., has just released a bulletin compiled to provide a convenient guide in determining which type and size of circular saw to use for a particular job. The bulletin illustrates and describes many types of saws and circular knives, and shows saws being made. The Chicago line, presented in the bulletin, includes crosscut, rip, cut-off, planer, mitre, combination, soft-metal, friction and special saws, dado heads and knives. A few types are shown in accompanying illustrations.

WIRE ROPE SLING—**A. Leschen & Sons Rope Co.**, St. Louis, Mo., recently issued an 8-page two-color bulletin giving details of the "HERCULES" Red-Strand Flat-Laced Wire Rope Sling, which is a sling made of six parts of wire rope laced together to form a flat, strong and flexible lifting device. The booklet gives details of design, advantages and applications, photographs and diagrams of the various types of loops, thimbles and hooks. Specifications charts amplify the text.

OPPORTUNITY SECTION

MODERN BARGAINS

PIONEER 48-V CRUSHING AND SCREENING PLANT

COMPLETE WITH CONVEYORS, BIN, FEEDER, PNEUMATIC TIRED TRUCK FRAME AND D17000 CATERPILLAR POWER. ENTIRE UNIT IN GOOD CONDITION READY TO GO TO WORK. LOCATION, DENVER, PRICE $20,000.

NORTHWEST 80-D SHOVEL

2½ YARD SHOVEL WITH NEW MURPHY DIESEL ENGINE. BALANCE OF MACHINE IN GOOD WORKING CONDITION. LOCATION EL PASO TEXAS, PRICE $30,000.

BARBER-GREENE HOT MIX PLANT MODEL 848

WITH LOADER, HEAVY DUTY MIXER, GRADUATION CONTROL, DUAL DRUM DRIER. LOCATION EL PASO, TEXAS, PRICE $30,000. BOILER AVAILABLE AT ADDITIONAL COST.

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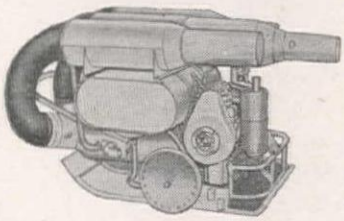
PORTABLE HEATER SALE

IMMEDIATE DELIVERY



Stewart-Warner portable powerful 100,000 BTU gasoline-burning heaters complete with turbine type blower and 1½ HP. air-cooled ball-bearing engine.

PORTABLE SELF-POWERED MANY PURPOSE HEATER.

HEATING buildings, shops, sheds, warehouses, manholes, tunnels, buildings under construction, spot-heating, etc.

PREHEATING engines, tractors, trucks, equipment, etc.

THAWING frozen areas, machinery, pipe lines, tanks, etc.

DRYING plaster, paint, mortar, concrete, etc.

ORIGINAL COST.....$583.00

SALE PRICE.....$195.00

Complete with flexible ducts

Send for literature

BERNSTEIN BROTHERS

Since 1890

Dept. WC PUEBLO, COLORADO

ANNOUNCEMENT

Sealed bids will be received in the office of the Chief Quartermaster, The Panama Canal, Balboa Heights, Canal Zone, and in the office of the Chief of Office, The Panama Canal, 411 - 10th St. N. W., Washington 25, D. C., until 10:00 a. m. E.S.T., March 22, 1948, and then publicly opened for furnishing all plant, tools, equipment, materials, labor and services and performing all work, including plumbing, drainage, air conditioning and ventilation, electric wiring, and special theater equipment for the construction of a motion picture theater, having a seating capacity of approximately 1300, at Balboa, Canal Zone. Forms of proposal with full particulars may be secured in the office of the Chief Quartermaster, Balboa Heights, Canal Zone or the office of the Architects, John and Drew Eberson, 2 West 47th St., New York, N. Y.

***Waterproof With* FORMULA NO. 640**

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.

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