

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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OCTOBER • 1947

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IN THIS ISSUE

Silted Channel Clearance
Colorado River at Needles

Pocatello Railroad Yard
Two Million Dollar Expansion

Tacoma Sewer Outfalls
Underwater Construction

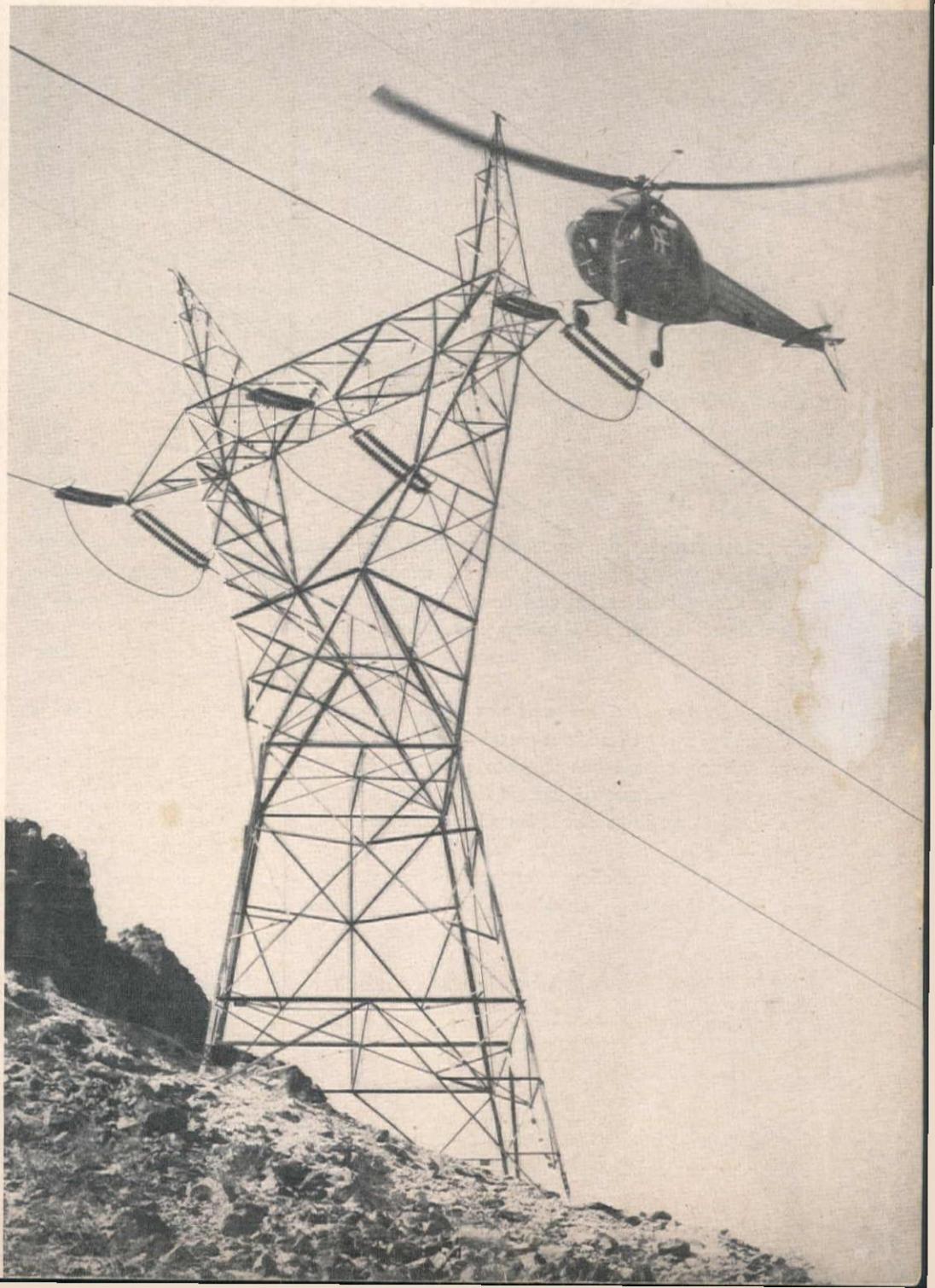
Roving Internationalist
Study of C. P. Dunn

Bureau Faces Criticism
Engineers Urge Changes

Jordan Narrows Siphons
Utah's Water Supply Solution

Horsetooth Reservoir
East Slope Work Pushed

Hovering like a huge bee is one of the helicopters now being used to patrol transmission lines from Hoover Dam to areas of Southern California. The Department of Water and Power of the City of Los Angeles has leased the helicopter service from the Armstrong Flint Co. to traverse the irregular terrain.



KEEP RUST OUT...

OF THE PICTURE



WHEN YOU lay up your equipment, brush *Texaco Rustproof Compound* over all exposed metal surfaces. They'll be safely and economically protected against rust by a soft, self-healing, *waterproof* film that removes easily when your equipment goes into service again.

Texaco Rustproof Compound not only prevents rust from getting a start on clean metal — it also gets right under existing rust, stops it from going further, and loosens it for easy removal. *Texaco Rustproof Compound* never hardens or chips off. It lasts long and costs little. In fact —

The cost of rustproofing every machine in your yard with *Texaco Rustproof Compound* is far less than the

cost of repairing the possible rust-damage to just one piece of equipment.

Keep rust out of your picture this winter. Get *Texaco Rustproof Compound* and helpful suggestions for its use from 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, New York.

EFFECTIVE PROTECTION FOR METAL EVERYWHERE

Use *Texaco Rustproof Compound* to protect metal everywhere. Gas holders, water works, sewage disposal plants, bridges — wherever metal is exposed to weather, or corrosive chemicals and fumes — *Texaco Rustproof Compound* gives protection at low cost. Texaco's 36-page book "Rust Prevention" tells the whole story, offers many money-saving suggestions. Write for your copy today.



TEXACO

Rustproof Compound

Tune in . . . TEXACO STAR THEATRE presents the TONY MARTIN SHOW every Sunday night. See newspaper for time and station.

Base your shovel purchase plans on Repeat Orders like this



Another Northwest makes seventeen for Isbell Construction Co. Reno, Nevada

ISBELL Construction Co. has used Northwest equipment for years. Not only do they know what Northwest performance is but they know other equipment as well.

It is significant that their last two machines have again been Northwests, making seventeen.

There can be no better testimonial to the kind of service Northwests give. One out of every three Northwests sold is a repeat order in the hands of responsible contractors like Isbell Construction Co. Ask them and base your Shovel, Crane and Dragline buying plans on repeat orders from firms like this.

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

Successful
Contractors
Keep Successful
with Good
Equipment

Local NORTHWEST sales agents

DENVER, COLORADO

The Mine & Smelter Supply Co.

CHEYENNE, WYOMING

Wilson Equipment & Supply Co.

BUTTE, MONTANA

Hall-Perry Machinery Co.

PHOENIX, ARIZONA

State Tractor & Equipment Co.

SALT LAKE CITY, UTAH

Arnold Machinery Co., Inc.

PORLAND, OREGON

Balzer Machinery Co.

NORTHWEST SALES OFFICES:

LOS ANGELES, CALIFORNIA
3707 Santa Fe Avenue

SAN FRANCISCO, CALIFORNIA
255 Tenth Street

SEATTLE, WASHINGTON
1234 Sixth Ave., South

Built

to Cut Hauling Costs



Bottom-Dump Euclids are designed and built for the specific job of moving big loads over off-the-highway hauls at the lowest cost per ton or yard moved. Here are some of the reasons for the outstanding production and performance records of Bottom-Dump Euclids on a wide range of earth moving jobs:

SPEED AND CAPACITY . . . loaded top speeds to 31.6 m.p.h. and capacities of 13 to 24 cu. yds. struck measure or 20 to 36 ton payloads; diesel engines of 150 to 275 h.p.

EASE OF HANDLING . . . short wheel base of tractor and the universal hitch permit sharp, fast turns and provide excellent maneuverability.

QUICK, CLEAN DUMPING . . . full length and width door openings and smooth, steep hopper sides shed the load quickly for non-stop dumping.

TRACTION AND FLOTATION . . . excellent weight distribution achieved by wedge shaped hopper of trailer and the Euclid hitch design . . . a large percentage of the trailer and payload weight is carried on the drive wheels for good traction . . . large single drive and trailer tires assure excellent flotation for soft haul roads and fills.

These are just a few of the Euclid features that add up to efficient off-the-highway hauling and greater profits for owners. Your Euclid Distributor or Representative will be glad to supply complete data on all current models of Euclid earth moving equipment.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

EUCLIDS  *Move the Earth* 

Brown, Fraser & Co., Ltd., Vancouver, B. C.; A. H. Cox & Co., Seattle, Wash.; Hall-Perry Machinery Co., Butte, Montana; Lively Equipment Co., Albuquerque, New Mexico; Constructors Equipment Co., Denver, Colorado; Pacific Coast Branch: 3710 San Pablo Ave., Emeryville, Calif.; Intermountain Equipment Co., Boise, Idaho, and Spokane, Washington; Lang Company, Salt Lake City, Utah; P. L. Crooks & Co., Portland 10, Oregon. REPRESENTATIVE: M. H. Johnson, W. 2411 Crown Avenue, Spokane, Washington.

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Volume 22

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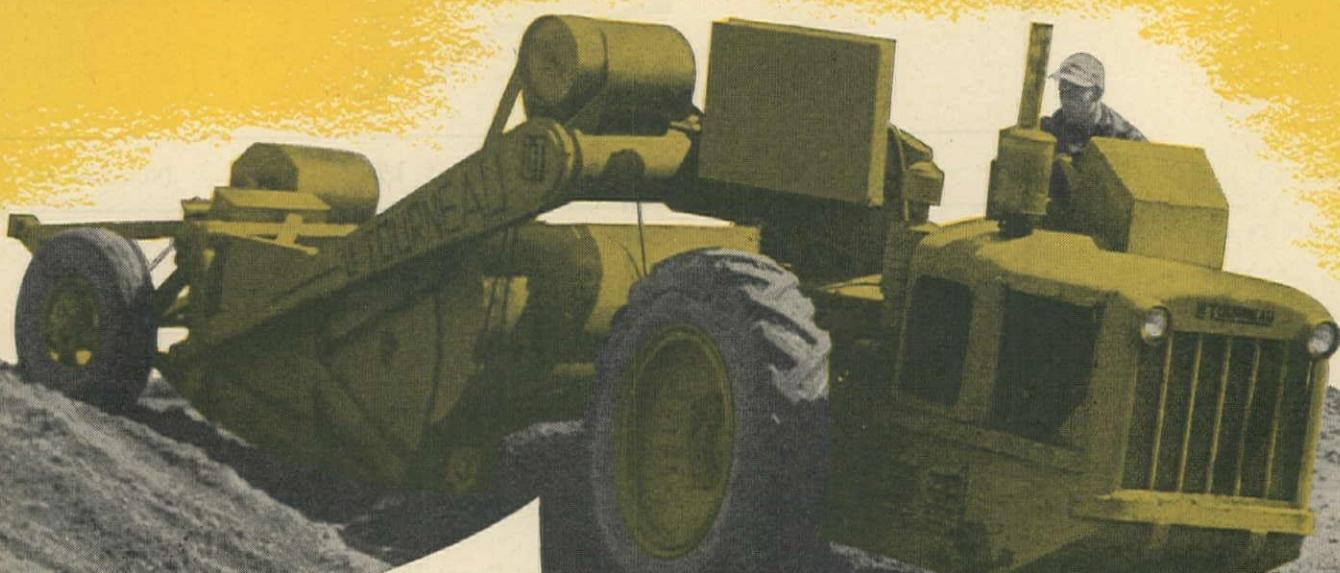
Number 10

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Covering the Western Half of the National Construction Field

Here's a new machine and that will *MAKE MONEY*



NEW D TOURNAPULL



Digs... hauls... spreads

Rig is self-loading . . . picks up 3.3 yards at a clip . . . hauls at high speed . . . spreads in smooth easily-compacted layers . . . ideal for working roadside gravel pits.



One-man operated

One man handles entire operation . . . load, haul, spread . . . no other labor or equipment needed. Easy to learn . . . easy to operate . . . easy to keep in good working condition.



Fast job-to-job moves

Travels over pavement or cross country at speeds up to 23 m.p.h. No waiting for trailer. Just hop on and go . . . move your dirt . . . move on to next job.



**See your LeTOURNEAU Distributor now for
complete facts on this ONE-MAN DIRTMOVER**

a new business **FOR YOU!**

HERE'S your chance to build a profitable "one-man business" — simply by cashing in on the ready-made demand for small contract dirtmoving.

A new type of business

You'll also be getting in on the "ground floor" because, until recently, there has never been an economical way to handle small, scattered dirtmoving jobs. Today, however, with the new high-speed "D" Tournapull, a self-powered, rubber-tired Scraper, one man can handle a number of small jobs per week . . . collect a good price for each job . . . develop an attractive business or side-line with a really promising future. Best of all, this versatile new tool eliminates the need for power shovel, trucks, flatbed trailer, drivers and operator formerly necessary to mechanize small dirtmoving operations.

\$12,000 gets you started

You can get a new 3-yard "D" Tournapull delivered to your door for less than \$12,000 complete. Less than \$25 per day pays your operating cost for this one-man dirtmover, leaving you plenty of room for profit.

Be first in your locality to offer this profitable new service. See your LeTourneau Distributor today for a FREE DEMONSTRATION.



Handles multiple jobs

High speed lets you handle a number of small jobs per week. Your only competition is a pick and shovel gang or power shovel with a couple of trucks.



All-weather tool

Goes anywhere, anytime. Not afraid of mud, snow or ice. Positive power steer, plus revolutionary new type differential take it through where trucks would stall.

Check these OPPORTUNITIES for small **CONTRACT DIRTMOVING**

Farms and Estates

\$ Digging stock ponds and irrigation ditches . . . terracing hilly land for cultivation . . . leveling feed lots . . . building soil saving dams . . . spreading top soil . . . graveling access roads.

Counties

\$ Cleaning drainage ditches . . . dressing shoulders and berms . . . building fire lanes and short feeder roads . . . graveling secondary roads.

Cities and Towns

\$ Grading streets for new subdivisions . . . landscaping around parks, golf courses and cemeteries . . . grading airport runways . . . covering garbage dumps . . . snow removal.

Builders

\$ Leveling and filling lots . . . digging group basements . . . grading and graveling driveways . . . spreading top soil . . . developing subdivisions.

Industries

\$ Stockpiling coal and bulk materials . . . grading for short spur tracks, leveling building sites . . . disposing of slag, cinders, other waste.

Mines and Quarries

\$ Stripping overburden . . . graveling haul roads . . . delivering or reselling gravel, crushed stone or aggregate loaded from stockpiles.

Railroads

\$ Grading right-of-way . . . cutting down banks . . . "day-lighting" curves . . . spreading ballast . . . grading for industrial sidings.

Mining Black Dirt

\$ Ideal for fill-in work. Can mine at convenient locations to service city and farm buyers.

LETOURNEAU
PEORIA, ILLINOIS



TOURNAPULLS

Tournapull—Trademark Reg. U.S. Pat. Off. C73

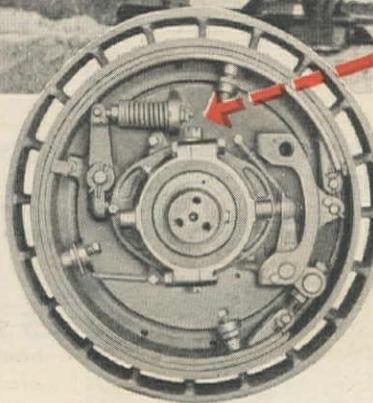
No MANUAL CLUTCH ADJUSTMENTS

for "warm-up" expansion



KOEHRING 205

Heat compensator spring eliminates need for repeated daily clutch adjustments. Expanding spring maintains full clutch efficiency when operating heat expands drum. Compensators on main drum (above), swing, and traction clutches.



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

On the Koehring 205 (1/2-yd.) repeated clutch adjustments to compensate for heat expansion are eliminated. No longer does operator take time out, when he starts in the morning and after lunch, to tighten cold clutches, then loosen them when clutches warm up. With the 205 you don't lose production for these adjustments.

205 Clutches Compensate for Heat

Koehring puts heat compensator springs on six main clutches of the 205. These automatically keep clutches working smoothly and easily, without manual adjustments. Time saved, plus improved control, steps up production, adds up to extra yardage.

KOEHRING

HEAVY-DUTY

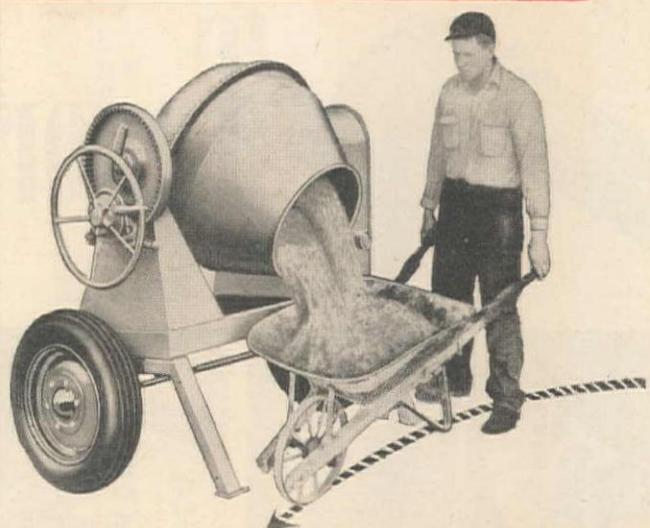
KWIK-MIX

New 3½-S End Tilter

A New Kwik-Mix Dandie

"Dandie" quality in every detail. Modern high strength welded construction. Thorough mixing action. End discharge saves effort — you don't back and turn loaded wheelbarrow. Approach mixer from either side or from the front. Spotting area is unobstructed. Trails fast, safely, because it rides on leaf springs.

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



PARSONS

Heavy Duty Trenchliner*

Parsons big, husky 310 Trenchliner keeps cost down, profits up on sewer, gas and water main jobs. Built-in strength makes every pound of weight pay off in extra hours of heavy duty trenching. Digs up to 15' deep, 54" wide. Telescoping boom shifts across entire width of Trenchliner. Power shifts arc type spoil conveyor.

*Trade Mark Reg. U. S. Pat. Off.

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

310 Trenches 15' Deep



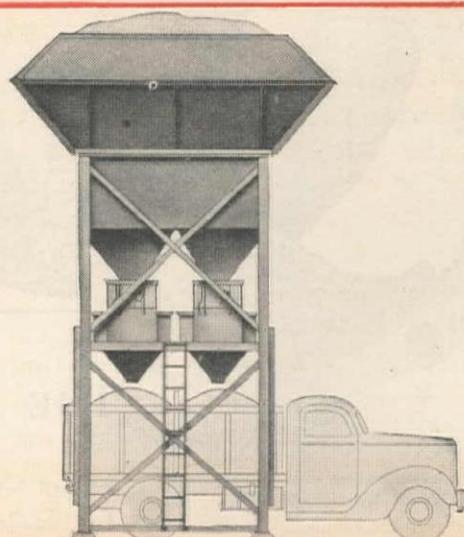
JOHNSON

2 Batches in 1 Stop

New Dual Aggregate Batch Plant

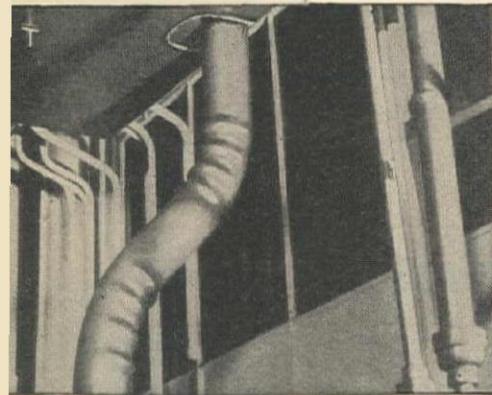
Fewer batch trucks needed with Johnson Dual Aggregate Batch Plant. Discharges two full batches simultaneously, in time other plants deliver one. 2-Batch trucks load in one stop . . . extra stops eliminated. No time lost at paver. 100 yard capacity; 3 compartments; 2 multiple material batchers. Fully portable.

Bay Cities Equipment, Inc.	Oakland
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
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The Harry Cornelius Company	Albuquerque
Western Machinery Company	Spokane
Western Machinery Company	Salt Lake City

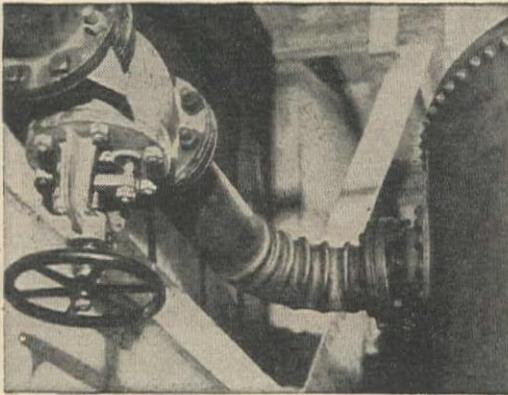




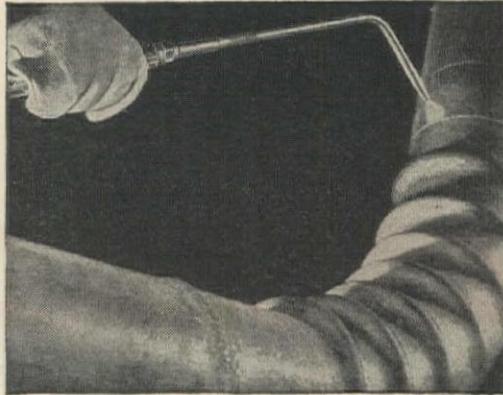
"Tailor-Made" Bends



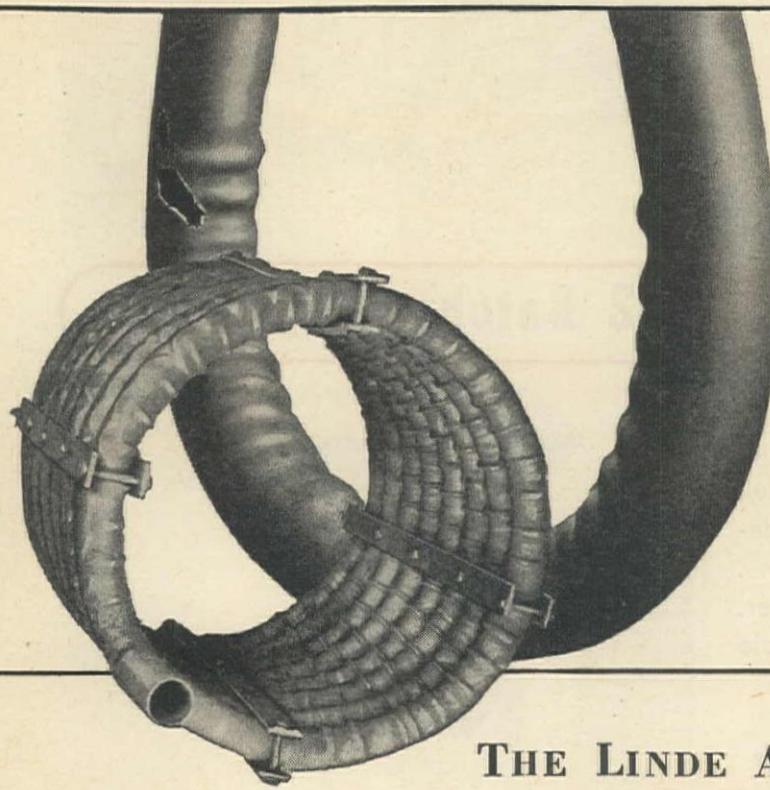
Where compound bends are required in a continuous section of pipe, wrinkle-bends offer an ideal solution. Wrinkle-bends are leakproof, as strong as the pipe itself, require no maintenance, and are easy to insulate.



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 and maintenance jobs. Just call the nearest LINDE office.

The word "Linde" is a registered trade-mark of
The Linde Air Products Company.

See HELIARC and UNIONMELT
Welding Demonstrations
Area No. 838 & 840
National Metal Exposition
Chicago, October 18 to 24

Linde

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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

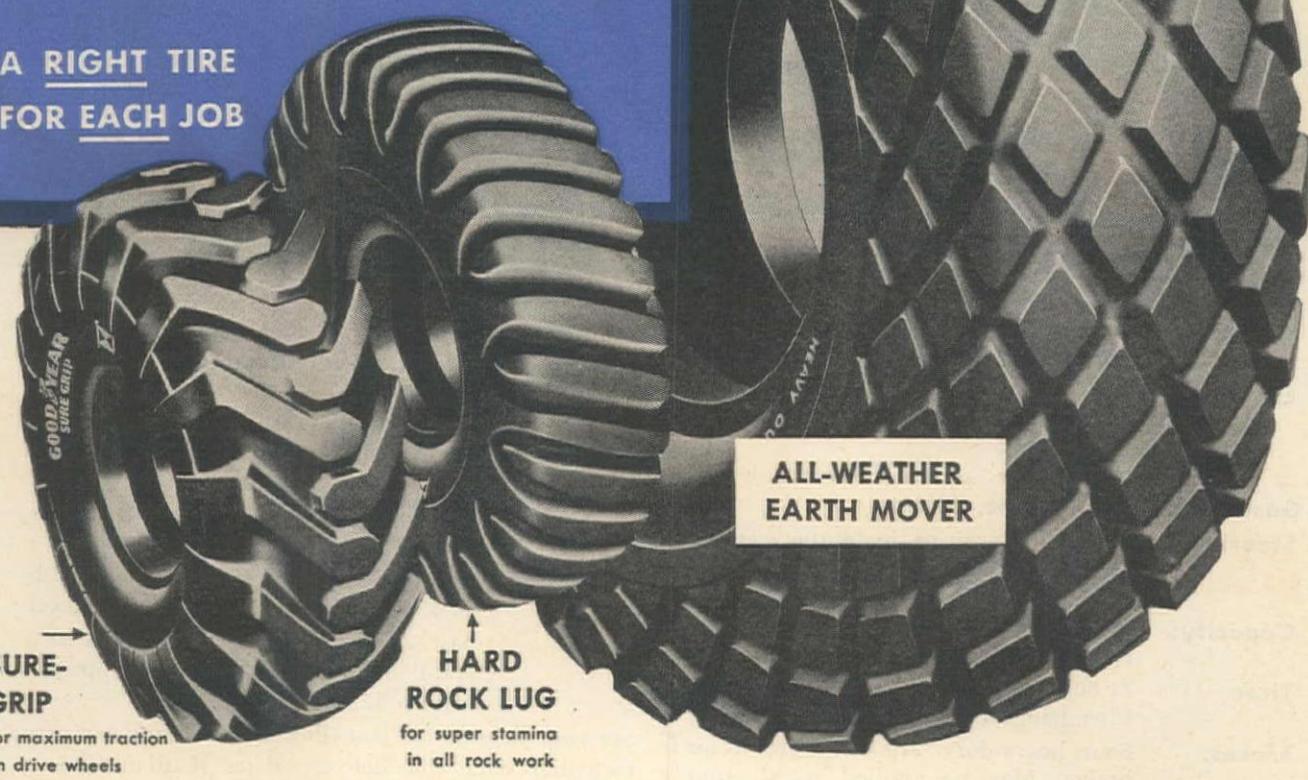
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

FIRST CHOICE with users

HERE'S the right tire for drawn vehicles and general traction—for low-cost, high-hour performance. It's Goodyear's All-Weather Earth Mover—sure-footed and easy rolling because its wide, rounded contours prevent deep penetration of the ground surface, reduce skids and slippage.

Not only the Earth Mover, but all Goodyear work tires are first choice with heads-up operators everywhere. And due to low-cost, long-life performance, Goodyears stay first choice. Year after year, more yards are moved on Goodyear off-the-road tires than on any other kind!

A RIGHT TIRE
FOR EACH JOB



BUY and SPECIFY
GOOD **YEAR**
—it pays!



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

GOOD YEAR

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

Here's the **MOTO** -



the **NEW** LaPlant-Choate *high-speed*

Speeds: 4 forward, 1 reverse
2.76 to 18.00 m.p.h.
(Conservative rating)

Engine: Buda Supercharged Model 6-DCS-844
225 h.p. at 1800 r.p.m.
6 cylinders
844.2 cu. in. piston displacement

Gasoline starting engine, 60 h.p.

Steering: Finger-tip, positive hydraulic steering
eliminates jackknifing. 27' level turning
radius. 60 degree turn each way.

Capacity: 14 yards struck
17.5 yards heaped

Tires: 21:00 x 29
Interchangeable front and rear.

Brakes: Four heavy-duty Timken-Detroit air
brakes. May be applied to all four
wheels simultaneously or to rear wheels
only as operator desires.

Low center of gravity

Modern LPC Scraper: Curved reinforced bottom;
3-piece offset cutting edge; positive
forced ejection; 103" apron opening;
open top for easy loading by shovel
or dragline; axles supported at both
ends for maximum strength; heavy-
duty, self-aligning type pusher block;
sheaves and cables out of the dirt.

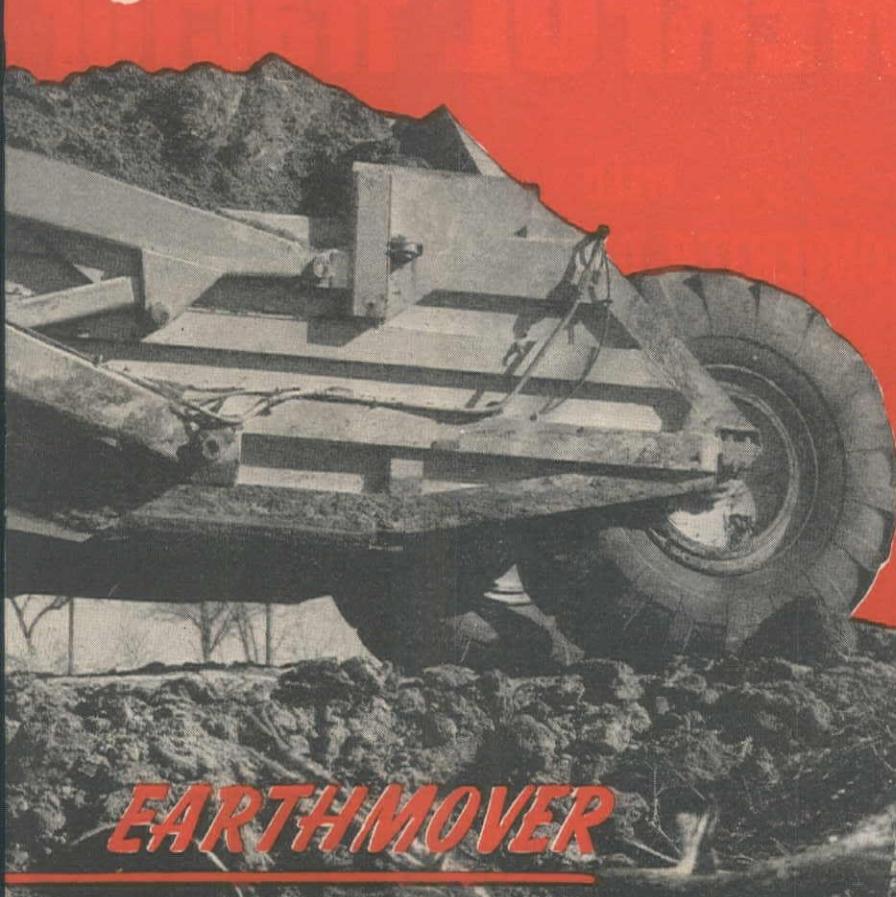
Dimensions: Over-all length 34'10"; over-all width
11'5"; over-all height 9'3 $\frac{1}{2}$ "; wheel
base 21'4 $\frac{3}{8}$ "; wheel tread (front and
rear) 88". Weight empty approxi-
mately 42,500 lbs.

See your nearest LaPlant-Choate distributor for per-
formance data and delivery dates. LaPlant-Choate
Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022
77th Ave., Oakland 3, Calif.

LaPLANT  CHOATE
HIGH SPEED EARTHMoving

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

SCRAPER



EARTMOVER



1. In the new LPC Moto-Scraper, there's plenty of power in the big engine and plenty of traction and flotation in the huge tires for the highest average haul speeds with heaped loads over all kinds of terrain.
2. Modern LPC scrapers — proved by competitive tests to be the easiest loading, fastest spreading scrapers on the market—will make even more profit for you in these new high speed Moto-Scrapers.
3. LPC positive forced ejection quickly and easily spreads all your loads whether you're handling dirt, sand or mud and sticky gumbo, and will do it in high gear to save valuable seconds on every trip.
4. Tractor and scraper are joined by pedestal hitch. With LaPlant-Choate positive hydraulic steering 60° turns each way are quickly and easily accomplished with power on both wheels.



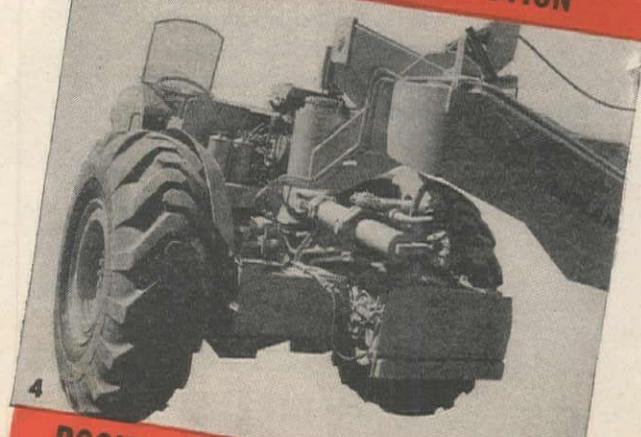
225 H. P. RUBBER-TIRED TRACTOR



RUGGED CONSTRUCTION



POSITIVE FORCED EJECTION



4
POSITIVE HYDRAULIC STEERING

now

WORLD'S LARGEST MOST POWERFUL tractor

Completely New . . . with
HYDRAULIC TORQUE CONVERTER DRIVE

BUILT TO GET MORE WORK DONE

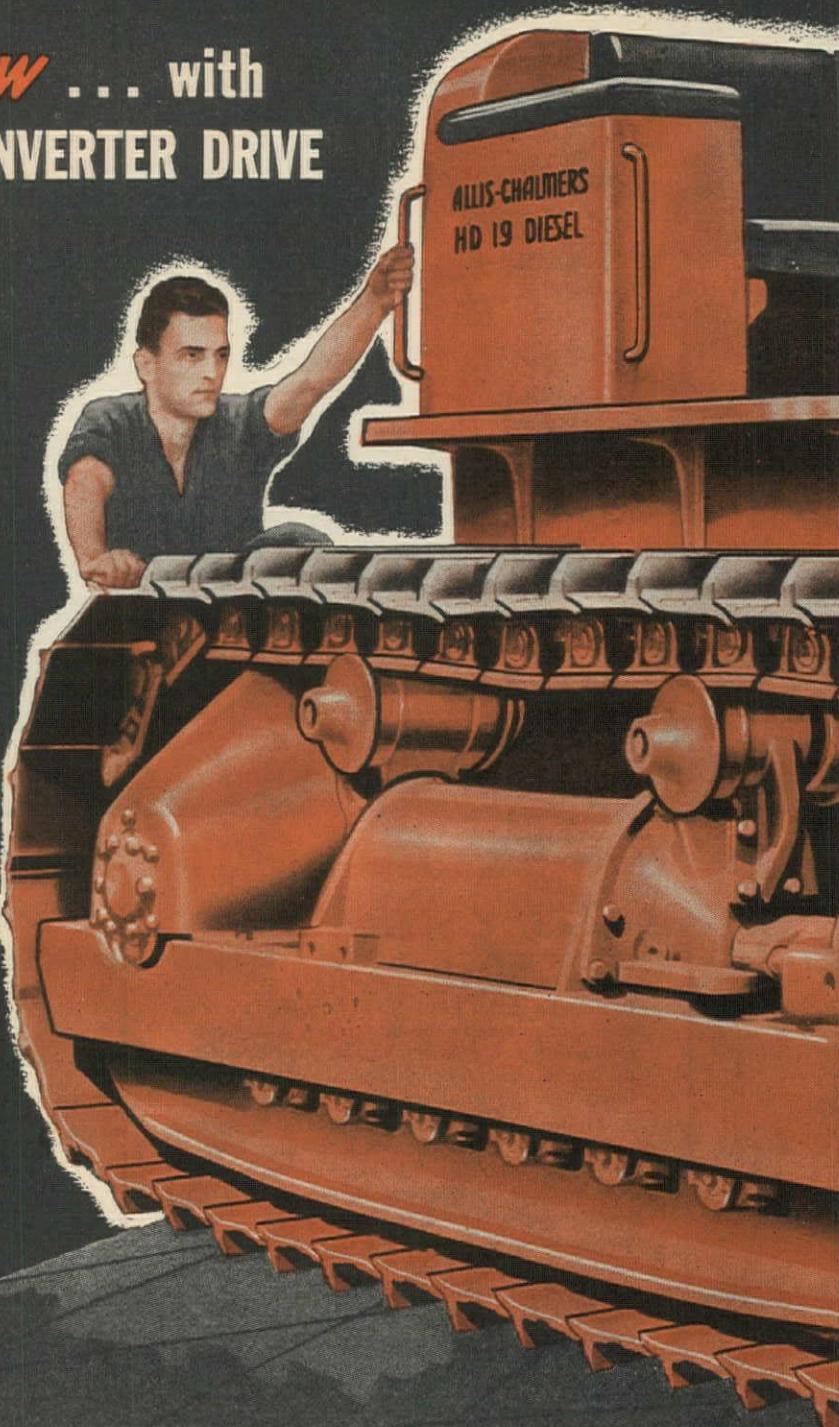
- Weight: 40,000 pounds. ● Power: 2-Cycle General Motors Diesel — 163 hp. at flywheel.
- Torque converter automatically balances load and speed without gear-shifting.
- Speeds: 0 to 3.0 in low gear and 0 to 7.0 in high; reverse, 0 to 5.5.
- More traction, more ground contact, better balance.

BUILT TO LAST LONGER, WITH LESS UPKEEP

- Torque converter smooths tractor performance — cushions engine and transmission from shock loads.
- Simplified maintenance — major assemblies conveniently serviced or removed. Operating adjustments easily reached, quickly made.
- Reduced lubrication — greasing intervals lengthened throughout . . . 1,000 hours on truck wheels, support rollers, front idlers.
- High clearance — over 16 inches.

BUILT FOR EASIER CONTROL AND GREATER OPERATOR COMFORT

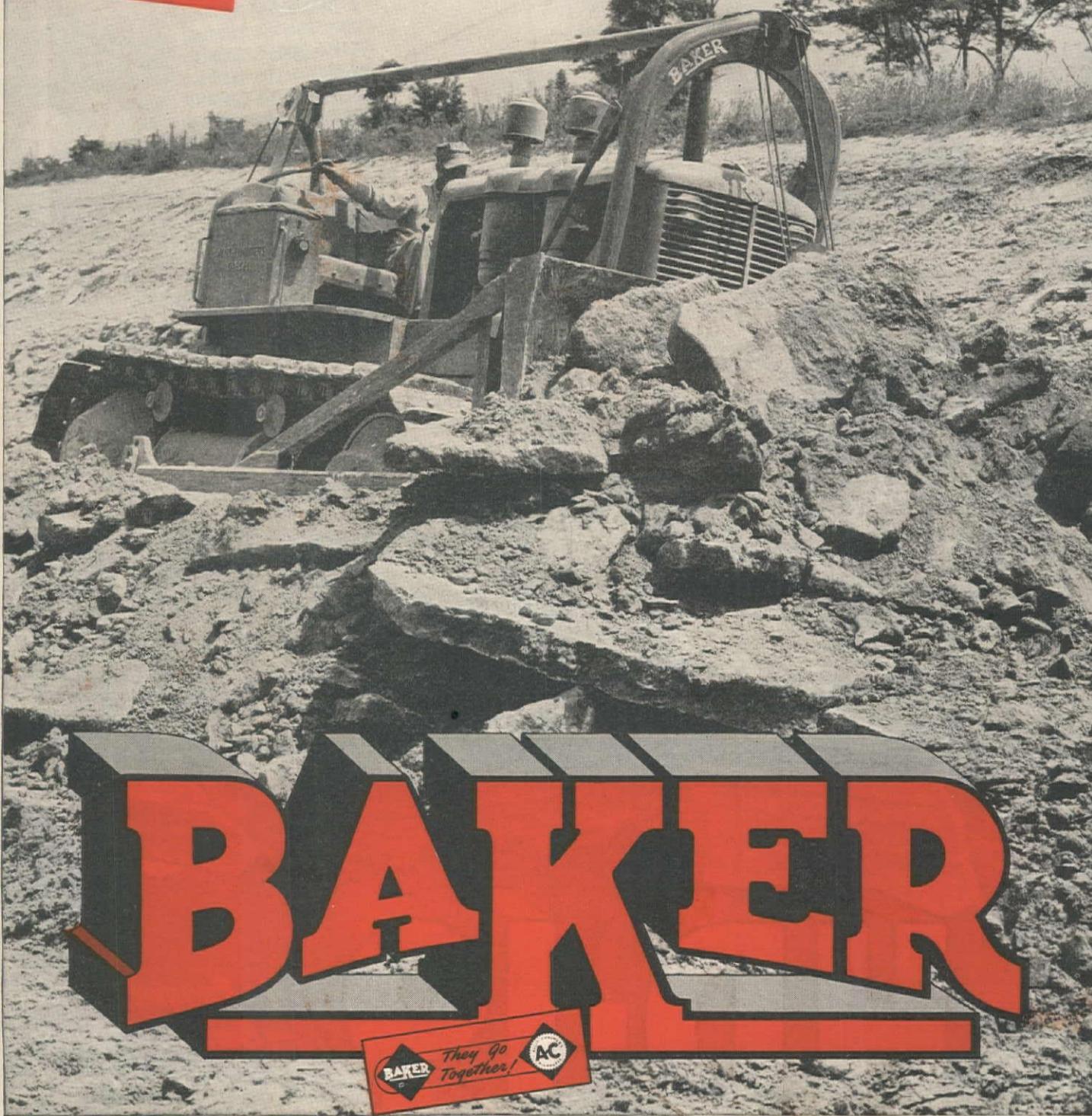
- Torque converter eliminates most shifting.
- Hydraulic, finger-tip steering.
- Convenient controls.
- Self-energizing brakes.
- New type, adjustable split seat.
- Wide arm rests.
- Adjustable brake pedals.
- Full visibility.
- Comfortable foot rests.
- Clean platform.



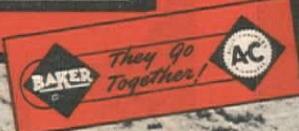
ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

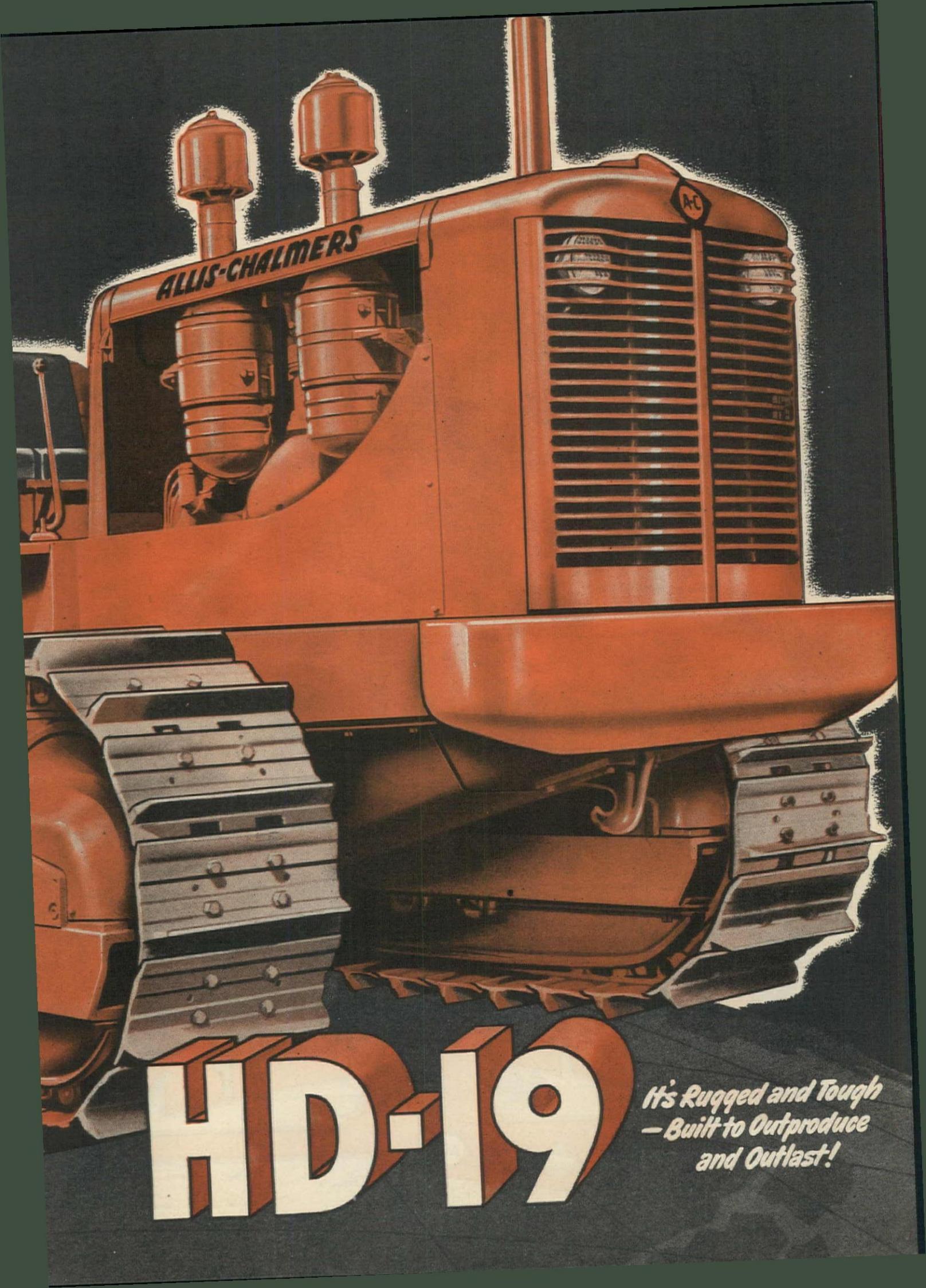
THE GREATEST TEAM ON

NEW CABLE
BULLDOZER



BAKER





ALLIS-CHALMERS

HD-19

*It's Rugged and Tough
- Built to Outproduce
and Outlast!*

EARTH...

BAKER Bulldozer
and
AC **HD-19**

NEW HYDRAULIC
BULLDOZER



The World's Largest Most Powerful Bulldozer

Here's a sensational combination — the largest tractor ever built engineered into Baker Bulldozers — to give you more traction, more power, more weight, more work capacity than ever before.

The HD-19 Baker Bulldozer with Torque Converter Drive provides unlimited operating speeds with a minimum of gear shifting — operating speeds that are automatically geared to load conditions for maximum efficiency. Over 48,000 pounds of weight provide "slip-proof" traction in all weather and ground conditions. Big 11'-1" x 4' mold-

boards roll mountains of earth and rock to pile up yardage in record breaking time.

Again Baker sets the pace with both cable and hydraulic Bulldozers and Grade-builders, each specifically engineered into the Allis-Chalmers HD-19. If it's low cost yardage — smashing power — continuous operation you're after, tackle your next job with an HD-19 and Baker 'Dozer — it's the greatest team on earth.

BAKER MFG. CO. • Springfield, Ill.

IMAGINE TACKLING THIS JOB
WITH ANY *Other* MACHINE
THAN A
GRADALL

IT LOOKED LIKE a costly hand-labor job when a Detroit contractor was called in on the excavation of a sub-basement in an already completed building. Ceiling clearance was only 11'6"; numerous pillars only 20 feet apart added to the problem. Any practical construction man recognizes the difficulties involved.

Look how ideally Gradall fitted into this job. Time was cut. Excavation was neatly floored, sides cut sheer and clean; practically no need for clean-up labor.

This example of Gradall's versatility shows clearly why Gradall, with its flexible "Arm Action", can do more jobs, and do them better, at lower cost—trench digging, highway widening, ripping and loading pavement, sloping and grading, ditch cleaning, back filling, snow removal and loading.

Tools for doing different jobs are quickly interchangeable—can be attached to the end of the boom in less than 15 minutes.

Mounted on heavy-duty truck chassis, Gradall can be driven from job to job at truck speed. Performs effectively on or off the highway.



Gradall Reg. U. S. Pat. Off.

Send for **FREE BOOKLET**
giving **SPECIFICATIONS**,
showing job applications

GRADALL
DIVISION

WARNER
&
SWASEY
Cleveland

WARNER & SWASEY COMPANY
Cleveland 3, Ohio

Please send the new GRADALL Book to:

Name _____

Address _____

City _____ State _____ J-1047



This photo shows what little elbow room is required for a 10-foot excavation. Reaching in and around, Gradall floored to a perfect grade, left clean cut sides.



Fast, telescoping action of boom makes digging and loading one continuous operation—loading out dirt in record breaking time.

SALES AND SERVICE:

GOLDEN STATE EQUIPMENT CO.

4770 Valley Blvd.
Los Angeles 32, California

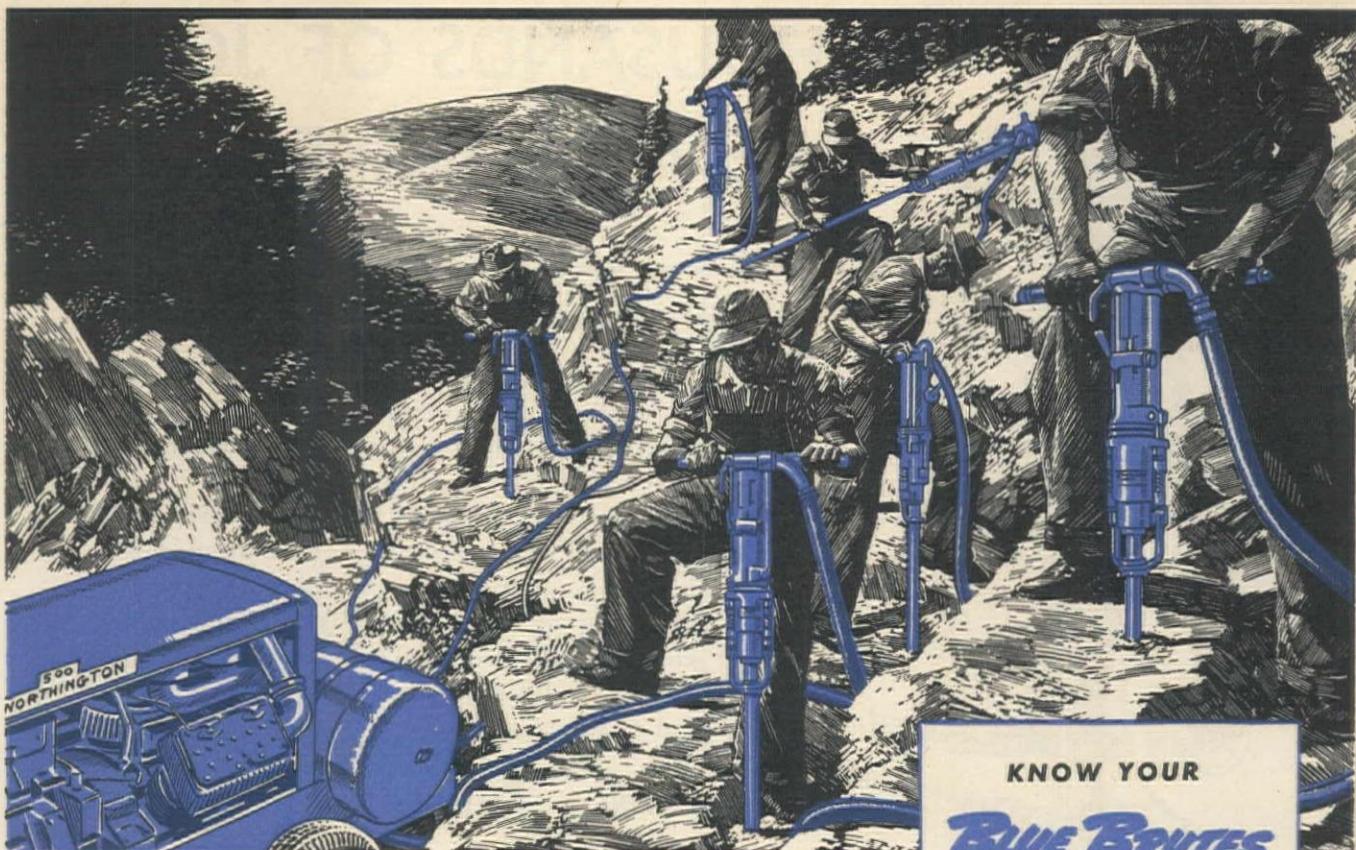
BAY EQUIPMENT CO.

3254 East Shore Highway
Richmond, California

INDUSTRIAL EQUIPMENT CO.

720 South 19th Ave., P. O. Box 2669
Phoenix, Arizona

THERE'S PROFIT-PACKED POWER IN EACH BITE



Every time a WJ55 Blue Brute Hand-Held Rock Drill bites into rock . . . it makes a big dent in operating costs, too.

That's because Blue Brute Rock Drills give close bidders the kind of performance that means quicker, cleaner, deeper drilling for longer periods with less punishment to the runner.

And this 55-pound rock eater needs no babying because it's tough-muscled at such key places as — its positive-acting, end-seating valve, its rugged chuck housing and its smooth-operat-

ing rifle-bar construction.

Furthermore, this top-notch performance is doubly sure when you team up WJ55's with a Worthington Blue Brute Compressor. This portable power-house gets its punch from light, tight, efficient Feather* Valves, rigid alignment through 3-point engine and compressor suspension, full force-feed lubrication and other features. Comes with Diesel or gasoline drive.

Write today for more detailed information on why *there's more worth in a Blue Brute.*

*Reg. U. S. Pat. Off.

H7-9

Buy BLUE BRUTES

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.

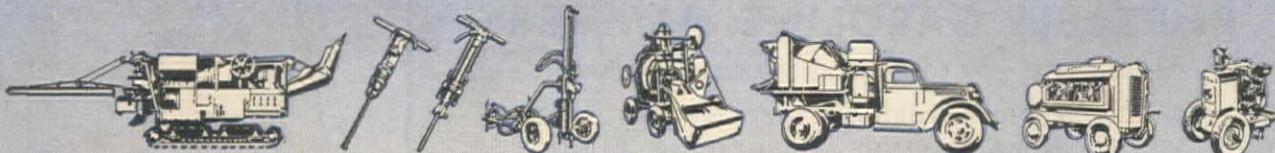
WORTHINGTON EQUIPMENT

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.



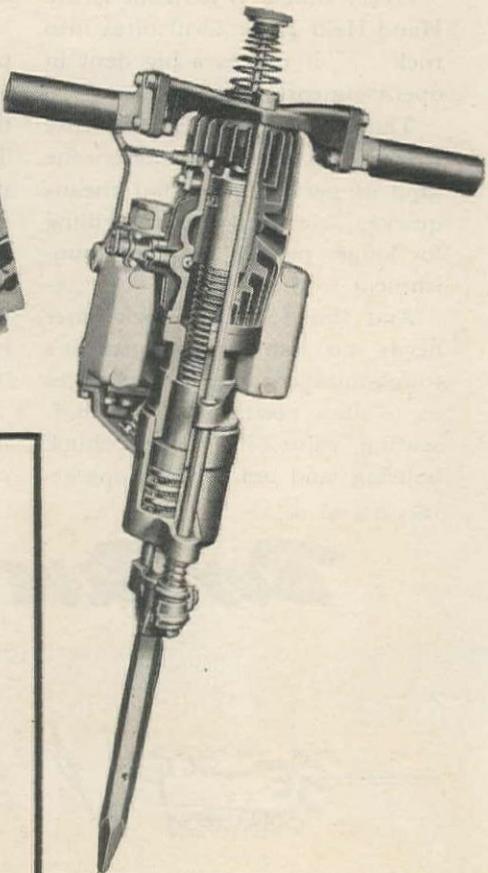
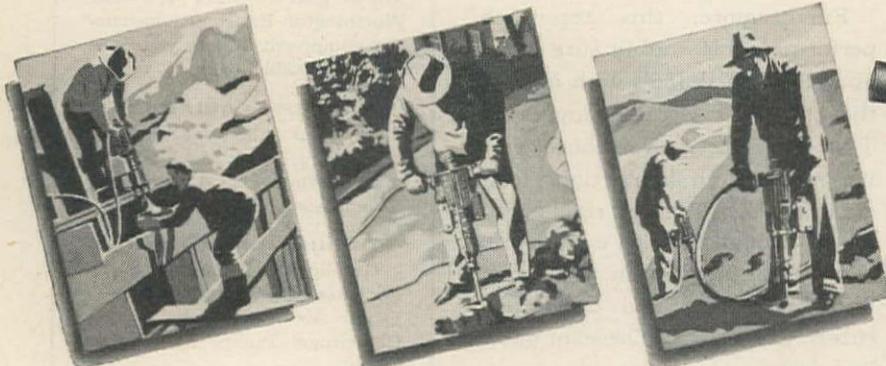
IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB



THOUSANDS OF JOBS ARE MOVING FASTER

All over the nation—on every kind of job, big or small—Barco Portable Gasoline Hammers are speeding up the work. And because these busy self-contained workhorses have proved so efficient, more and more bosses are calling for Barco. They like the way it works in rugged or hard-to-reach spots, and the strength it gives a man, big or small. Barco is available with eleven special tool attachments, adaptable to dozens of different jobs. Write for complete information.

BREAKING • DRILLING • DRIVING • TAMPING



BARCO

PORTABLE GASOLINE HAMMERS

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

BARCO MANUFACTURING COMPANY, LTD. INC.
1819 WINNEMAC AVENUE, CHICAGO 40, ILLINOIS

In Canada: The Holden Co., Ltd., Montreal, Canada

SMALL

1"

1"

Weight 0.283#/ft.

OR
LARGE

ALCOA ALUMINUM STRUCTURAL SHAPES

are strong, light, non-rusting

You can get light, strong Alcoa Aluminum Structural Shapes in the sizes, lengths and shapes you require . . . from 1-inch angles to 12-inch channels.

Alcoa Aluminum Structural Shapes are strong . . . tensile strengths as high as 70,000 psi.

Alcoa Aluminum Structural Shapes are light . . . aluminum weighs only $\frac{1}{3}$ as much as structural steel . . . cheaper to ship . . . easier to erect.

Aluminum structural members cannot rust, require no painting to protect them from weather and industrial fumes.

For design data and information on the use of Alcoa Aluminum Structural Shapes, get in touch with our nearest sales office. ALUMINUM COMPANY OF AMERICA, 1811 Gulf Building, Pittsburgh 19, Pennsylvania. Sales offices in 55 leading cities.

MORE people want **MORE** aluminum for **MORE** uses than ever

12"

3.3"

Weight 12.45#/ft.

REG. T. M.



ALCOA FIRST IN ALUMINUM

IN EVERY COMMERCIAL FORM

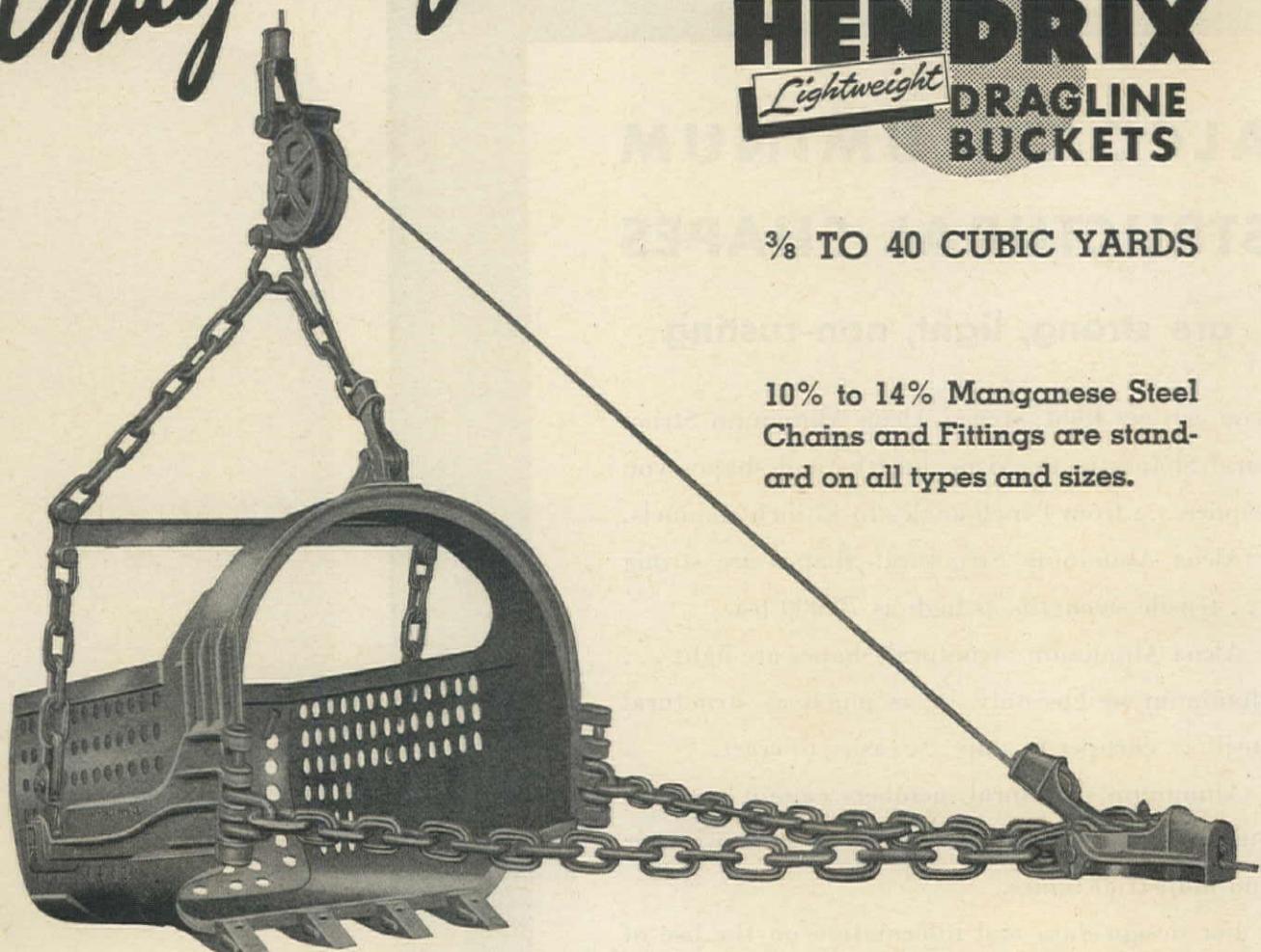
• DEEP DITCH • *NARROW DITCH • WIDE DITCH • SHALLOW DITCH • CLEAN-OUT WORK • STRIPPING OVERTURNED •

Dragline Jobs

ARE NO PROBLEM
WHEN YOU USE

HENDRIX
Lightweight
DRAGLINE
BUCKETS

3/8 TO 40 CUBIC YARDS



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

HERE ARE THE REASONS WHY:

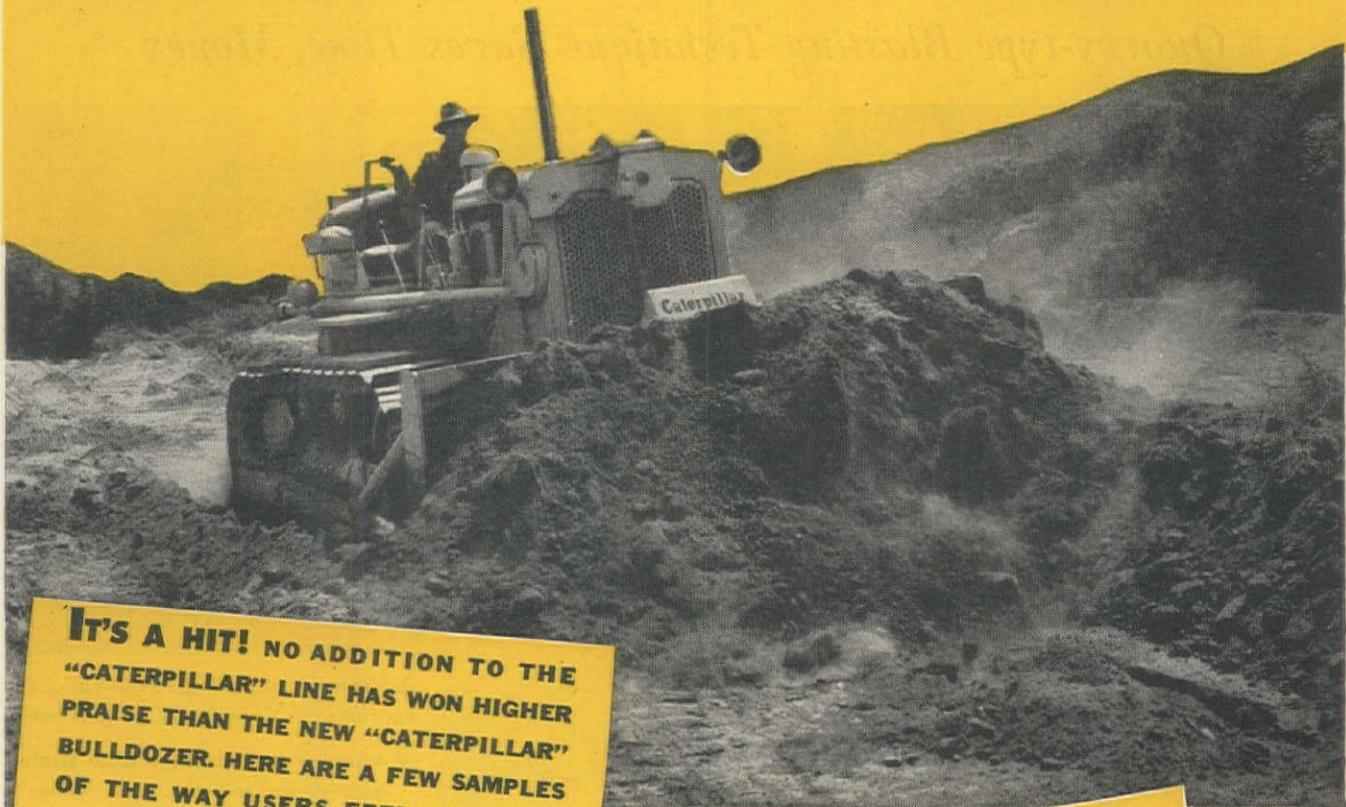
1. 20% to 40% lighter than other buckets, type for type.
2. All welded construction for greater strength and durability.
3. Manganese Steel chains, fittings, and reversible tooth points.
4. Full Pay Load every trip, even in wet digging.
5. Perfect Balance; handles easier, fills faster, dumps cleaner.
6. Three Types: light, medium, and heavy duty. With or without perforations.

*For narrow ditch work, side-cutting teeth are available.

WRITE FOR DESCRIPTIVE LITERATURE OR ASK YOUR DEALER

HENDRIX MANUFACTURING COMPANY
MANSFIELD INCORPORATED LOUISIANA

USERS REPORT ON THE "CATERPILLAR" BULLDOZER



**IT'S A HIT! NO ADDITION TO THE
"CATERPILLAR" LINE HAS WON HIGHER
PRAISE THAN THE NEW "CATERPILLAR"
BULLDOZER. HERE ARE A FEW SAMPLES
OF THE WAY USERS FEEL ABOUT IT:**

From Walter O'Neill, contractor, Havre, Montana

"Unquestionably it's the best and last word in 'dozers. The ability to tilt the blade enables doing lots of work that would previously have required an angledozer. We moved 9000 cubic yards in 5 days this past week. This 'dozer beats any we know of."

From Harry Sandora, D7 operator, Conn.

"With the D7 and the 'Caterpillar' Bulldozer blade I can walk these 2-foot stumps right out of the ground."

From S. T. Lambeth, Greensboro, N. C.

"Best darn 'dozer I've ever owned or seen operated. Visibility is perfect; blade extremely rugged and durable; dirt seems to roll from the blade instead of sticking to it; blade reacts very quickly to the controls and it will dig harder material than any other 'dozer of comparable size on the market."

From John Gaston, Main Roads Commission, Queensland, Australia

"I think the 'Caterpillar' 'dozer is the best and most easily controlled of any I have handled. Driving a D7 with 'Caterpillar' 'dozer attached, I loaded 1980 yards of earth in 8½ hours."

**From N. M. Whilden, contractor,
Dallas, Texas**

"I've made no adjustments to this unit in 3 months, where formerly on other equipment adjustment was necessary every day."

**From Jim Calas, farm contractor,
Lakeview, Oregon**

"Since running it a month, am more glad than ever I waited. It does everything a fellow could ask. The 'dozer handles nice and easy and accurate."

**From R. H. Byles, lumberman,
Fresno, Calif.**

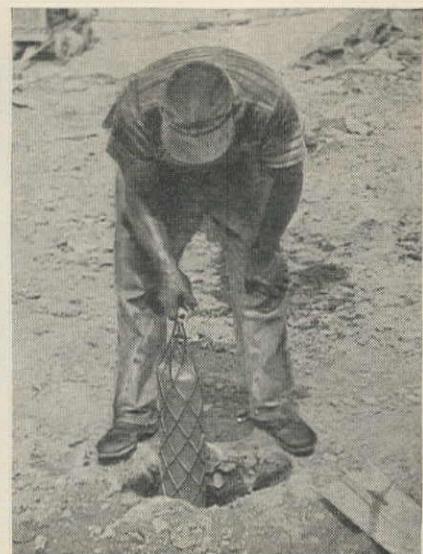
"This outfit is rugged. It's the best dirt-moving 'dozer I've seen."

CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

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

DU PONT "GELEX"** in Well Drill Holes SPEEDS ROAD JOB

Quarry-type Blasting Technique Saves Time, Money



▲ **Shooter preparing to load 5" x 24"**
cartridge of "Gelex" into well drill hole.

◀ **40-foot face of hard blue shale**
is sheared clean and square by "Gelex"
shot in well drill holes.

In constructing a section of a new super-highway in New York State, The Grandview Co. of Mt. Vernon, N.Y., had to cut through a rocky hill. A Du Pont Explosives representative recommended the use of large cartridges of "Gelex" semi-gelatinous dynamite in well drill holes.

This technique meant the shattering of many more cubic yards of rock per shot than could be achieved with wagon drill holes and smaller charges—thus saving time for the contractor. Because conditions permitted the use of economical "Gelex" instead of gelatin dynamite, there was a direct saving in cost.

The Du Pont representative specified burden and spacing of well drill holes. He supervised

loading and firing of "Gelex" charges. The material to be shot was hard, stratified blue shale with many large fissures near the top. Despite these difficult shooting conditions, a clean, square, 40' face resulted. Excellent fragmentation facilitated removal of the rock.

Whenever road work presents a special problem of blasting . . . call in your Du Pont Explosives representative. Du Pont Technical Service and Du Pont explosives and accessories give the time- and money-saving results you want.

E. I. du Pont de Nemours & Co. (Inc.), Hoge Bldg., Seattle, Wash. — Old National Bank Bldg., Spokane, Wash. — Midland Savings Bldg., Denver, Colo. — 111 Sutter Street, San Francisco, Calif.

*Reg. U. S. Pat. Off.

DU PONT EXPLOSIVES
Blasting Supplies and Accessories

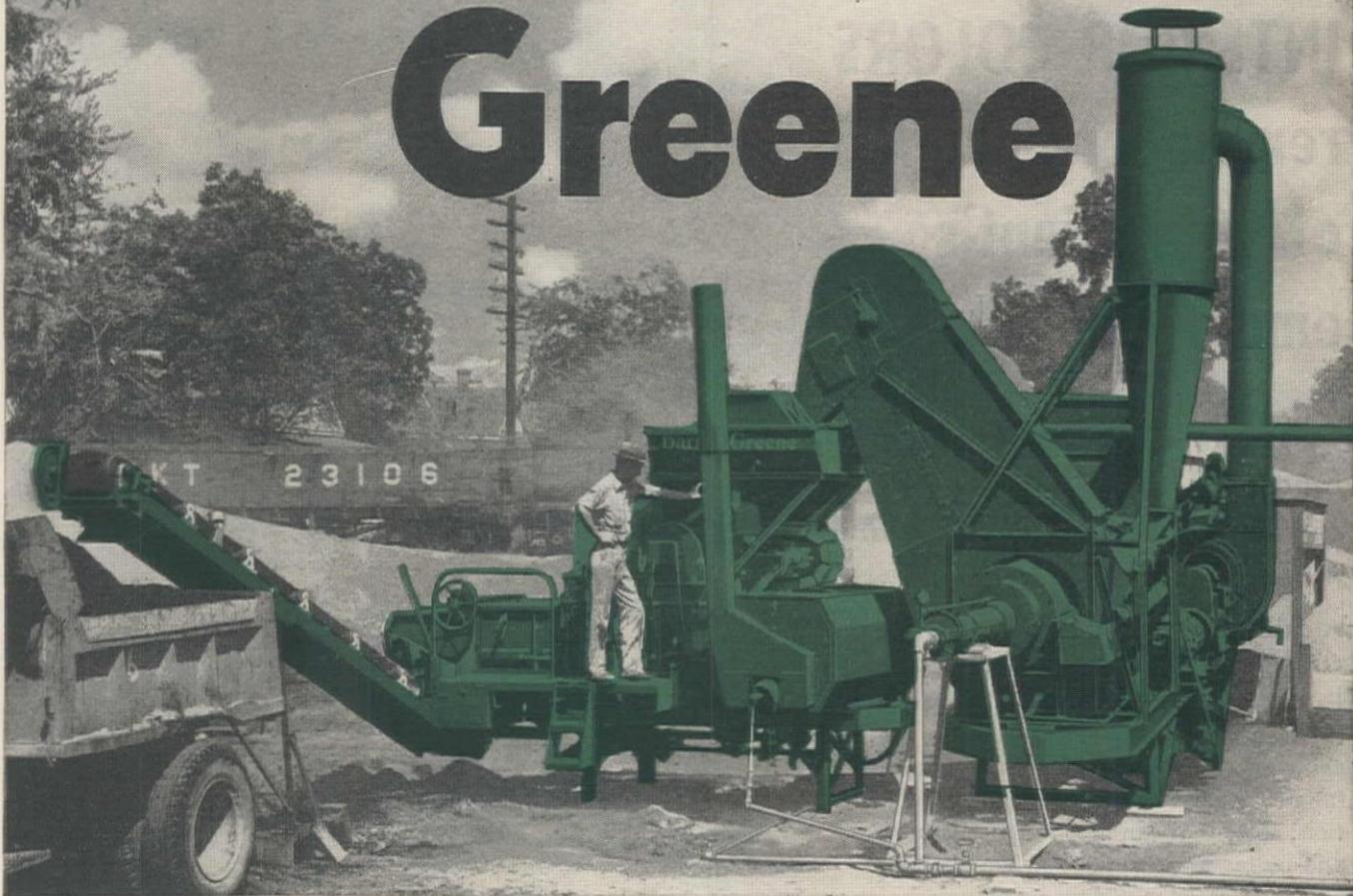
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

(Listen to "Cavalcade of America"—Monday evenings—NBC)



REG. U. S. PAT. OFF.

Barber-Greene



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,

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

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.



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 2, 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.

When you specify INTERIOR COLORS remember the EYES of your client's employees

Color Engineering makes color functional as well as beautiful—corrects causes of eye-strain and fatigue—increases efficiency—reduces accidents

Paint is more than protection, important as that can be. Paint is COLOR—color that can weaken morale through strain and fatigue or raise morale through stimulation; color that can help a man do more and better work without strain, keep him alert and safer in danger areas.

That's why we suggest Color Engineering by Fuller for new construction, remodeling or maintenance work.

Our trained representative will talk Color Engineering with you, or with you to your customer—and without obligation. Why not have him demonstrate a Color Engineering survey—see exactly how this modern color approach meets the functional requirements of structures, plant machinery and equipment?

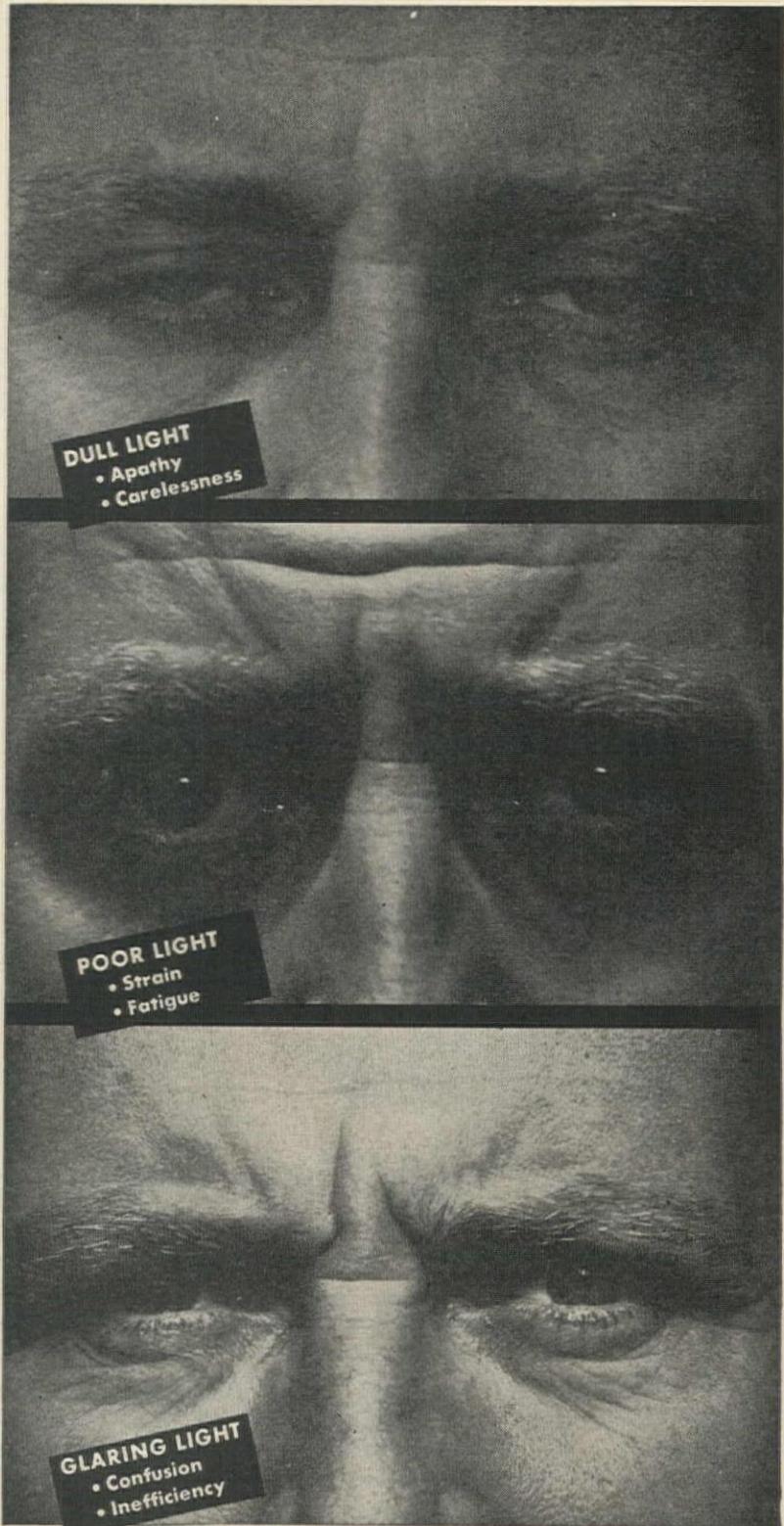
W. P. Fuller & Co., San Francisco.
Branches and Dealers throughout the West.

NEW structural steel Primer

Composite Red LZI (lead, zinc, iron) Metal Primer is far advanced over old rust inhibitors. Gives longer service at less cost. Definitely worth knowing!

Fuller leads in floor finishes

Our specifications show why leading recreation arenas, institutions and industrial plants use Fuller floor preservatives. Use proof is the final proof!



FREE—For your files: Our 24-page book, "Color Engineering by Fuller." Full-color photos; complete text.

**FULLER
FINISHES**



20% to 30% more footage

AIR
PLUS

JAECER COMPRESSOR

with Jaeger Model 600

Compressor behind your wagon drills

600 cu. ft. of air per minute, delivered at standard engine speed, operates two big 4" drills at top efficiency plus hand-held drill for secondary work.

Gives you the world's fastest drilling team on wheels, with a more portable compressor than your old 500 ft. machine.



Jaeger engineering, applied to biggest portable compressors, provides the 100 additional cubic feet of air you need to keep two wagon drills under full operating pressure and also handle secondary drilling, without wasteful engine speeds or a bigger, clumsier machine. The Model 600 "AIR PLUS" is powered with Murphy ME-66 Diesel, operating at 1225 r.p.m., and ruggedly but compactly designed to trail wherever big material trucks can travel. Built to micro-precision standards with giant "ultra

lapped" valves, 100% efficient air intercooling and automatic drainage, it delivers this air at 100 lbs. pressure within 100° of ambient temperature and with a minimum of moisture. Full force feed lubrication, oversize air receiver and tool boxes, electric starter, sectional radiator and intercooler, etc. are standard.

Other Jaeger "AIR PLUS" Compressors with these same features are available in 60 to 500 ft. sizes — gasoline, diesel or electric powered. See your Jaeger distributor.

- 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.

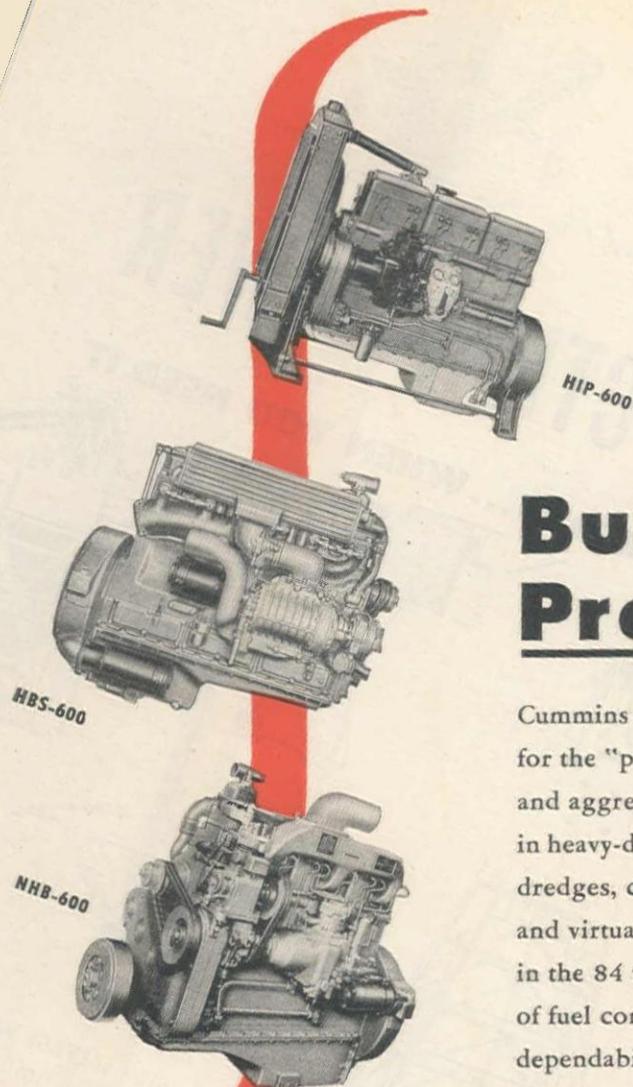
- ANDREWS EQUIPMENT SERVICE Spokane 9, Wash.
- CENTRAL MACHINERY CO. Great Falls, Mont.
- TRACTOR EQUIPMENT CO. Sidney, Mont.
- WORTHAM MACHINERY CO. Cheyenne, Wyo. and Billings, Mont.
- HARDIN & COGGINS Albuquerque, N. M.
- MILES CITY EQUIPMENT CO. Miles City, Mont.



BASIS for your profits

The best diesel engine that modern research and manufacturing methods can produce . . . backed by an unmatched dealer network of power specialists who provide genuine parts, trained mechanics and technical assistance. These are two important reasons why your investment in Cummins Dependable Diesels will prove profitable.

CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA



Built for the Premium Jobs

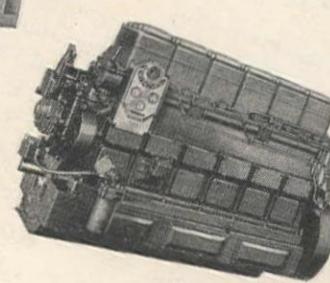
Cummins Dependable Diesels are designed and built for the "premium" jobs in the construction and aggregates industries . . . for installation in heavy-duty shovels, cranes, draglines, rock crushers, dredges, compressors, off-highway trucks and virtually every other kind of equipment in the 84 to 275 hp range. Economy of operation, of fuel consumption and maintenance, and rugged dependability are characteristics of Cummins Engines that have been proved on hundreds of jobs like yours. These "producers of low-cost power" are built by a company whose 29 years of manufacturing experience have been devoted exclusively to medium and high-speed diesel engines.

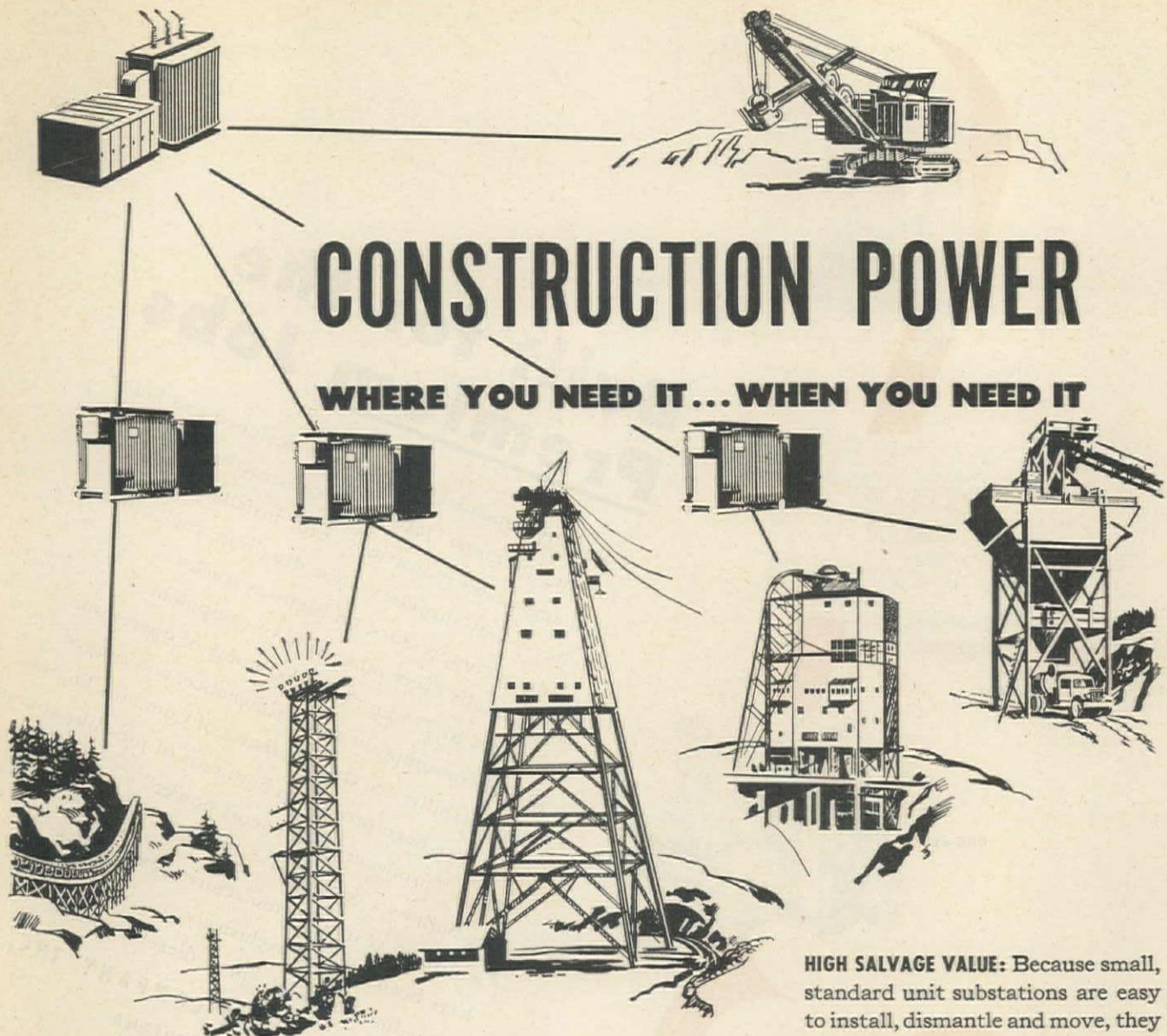
CUMMINS ENGINE COMPANY, INC.
COLUMBUS, INDIANA

SPECIFICATIONS

Series	Bore and Stroke	Piston Disp. (Cu. In.)	Maximum Rating (H.P. and R.P.M.)	Net Weight* (Lbs.)	Dimensions*
H-600	4 1/8 x 6	672	150 @ 1800	2160	57 x 30 x 46
HS-600	4 1/8 x 6	672	200 @ 1800	2540	58 x 32 x 47
NH-600	5 1/8 x 6	743	200 @ 2100	2600	59 x 41 x 63
NHS-600	5 1/8 x 6	743	275 @ 2100	3000	59 x 41 x 61
L-600	5 1/8 x 6 7 x 10	2309	250 @ 1000	7590	92 x 44 x 58

*Approximate for basic engine. Does not include accessories.





CONSTRUCTION POWER

WHERE YOU NEED IT...WHEN YOU NEED IT

Easy to install, move or expand...G-E LOAD-CENTER DISTRIBUTION SYSTEMS offer reliable, flexible power for large construction projects

Here's how General Electric unit substations, used so successfully in strip mining, can be applied to large, long-term construction jobs . . . at a profit. Their high salvage value, portability and ease of installation will appeal to farsighted contractors. Power costs are reduced, too, by locating the substations near their loads, thereby keeping voltage high and cable short and light. Other advantages:

SAFE: Metal-clad unit substations combine transformers and circuit-

breakers in one factory-assembled package; breakers protect your equipment from overload, the metal enclosure protects personnel from injury.

EASY SERVICING: Maintenance personnel work *on the ground* safely, quickly; no poles to climb.

ECONOMICAL: Evaluating the good voltage regulation, short-circuit protection and high service continuity provided, G-E load-center distribution systems give you more for your power-equipment dollar.

HIGH SALVAGE VALUE: Because small, standard unit substations are easy to install, dismantle and move, they may be moved to your later jobs at a substantial saving in man-hours.

These are only a few of the advantages of modern load-center distribution systems for construction work. Let your G-E representative show you the entire picture; he will study your power requirements and help you select the best system for your particular needs. *Apparatus Department, General Electric Co., Schenectady 5, N. Y.*



ELECTRIFIED CONSTRUCTION

BETTER PRODUCT ★ LOWER COST

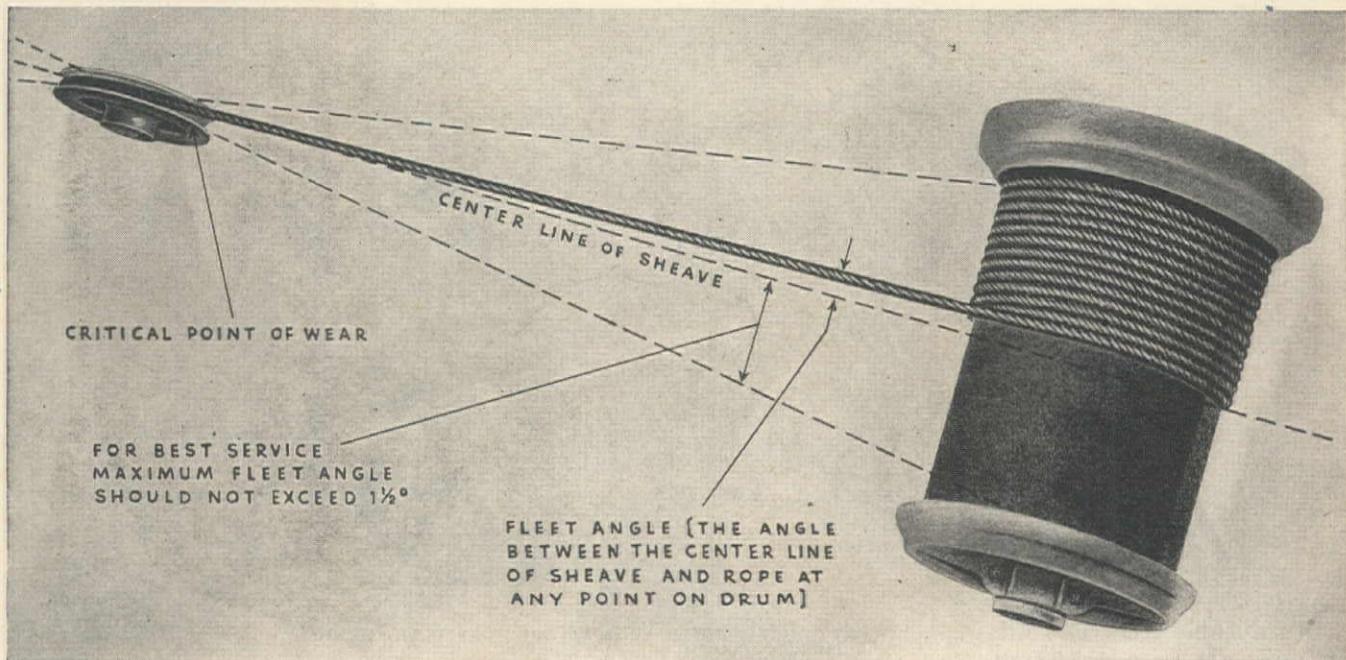
GENERAL ELECTRIC

Proper fleet angle stops sheave-wear on wire rope

*A Columbia
wear-saving tip*

The fleet angle is the side angle at which the rope approaches the sheave from the drum. Too great an angle will result in wear on the rope by the flanges of the sheave. The maximum safe fleet angle is generally considered to be $1\frac{1}{2}$ degrees—

equivalent to forty feet of lead for each foot of traverse travel on the drum on either side of the center line of the sheave. For example...a drum with a two-foot traverse should be placed forty feet from the sheave.



On any job...on any equipment...American TIGER BRAND Wire Rope has the stamina to stand up under long, tough usage. It's produced by Columbia here in the West under United States Steel's exacting specifications and is available preformed and non-preformed. Some users select preformed because this construction makes each strand carry its share of the load...gives maximum handling ease...resists bending fatigue and, because it's free of torsional stresses, travels smooth and true in the groove.

Get in touch with your nearest dealer...see for yourself why Tiger Brand has a national reputation for performance.

COLUMBIA STEEL COMPANY

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• *Don't get caught with your lines down! Keep an extra line on hand and be sure it's TIGER BRAND*

UNITED STATES STEEL

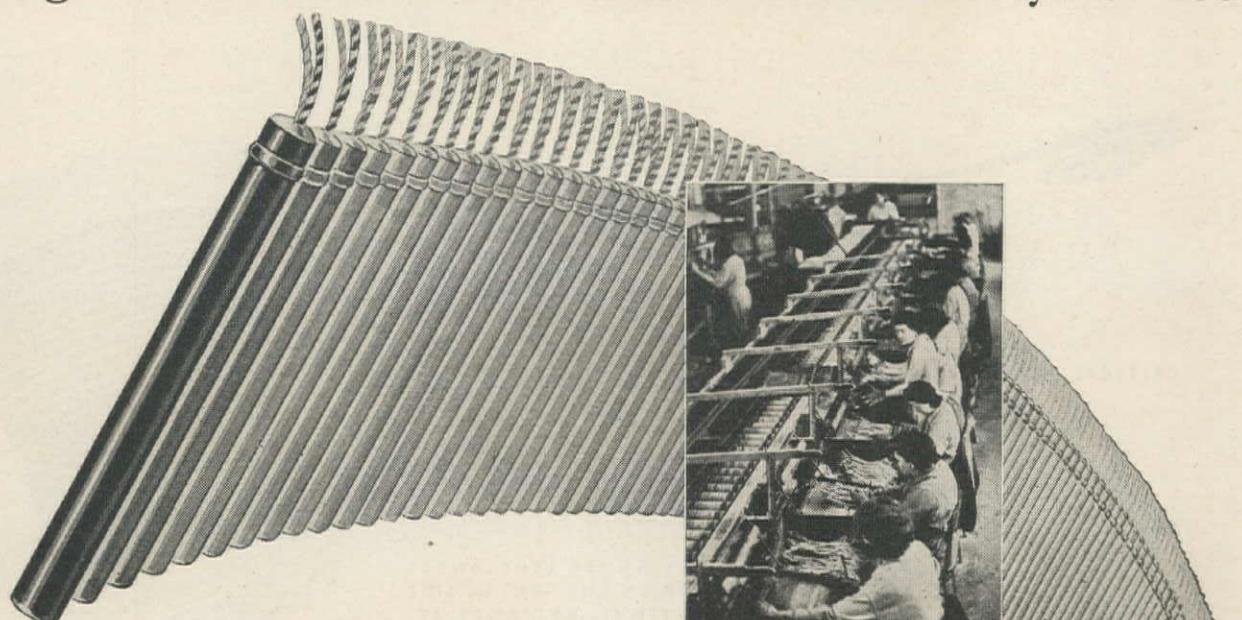
NO EXPLOSIVES ACCIDENTS

in the making of

520,000,000

MANASITE DETONATORS

An Eight-Year Record That Means Added Safety For You



Nearly nine years ago, Atlas announced MANASITE detonators, with the new nitromannitol explosive compound—less sensitive to shock and friction—a complete departure from ordinary detonators.

Today, we have completed nearly nine years of MANASITE detonator manufacture without a single accident of explosive origin. Over 520 million MANASITE detonators have been used.

Prior to introduction of MANASITE, occasional accidents of explosive origin did happen in our own manufacturing plant, despite most elaborate precautions.

We do not say any detonator is com-

pletely safe. We have not relaxed our plant safety precautions one iota.

But we do say and proudly believe that the MANASITE safety record reflects itself in field use—tending to minimize the accident record incident to detonators. To thousands of miners, quarrymen and construction workers interested in safety, this is a significant fact.

Even with this increased safety, MANASITE detonators are dependable in action. There is no sacrifice of detonating efficiency. And no increase in cost. Get in touch with your Atlas Representative for complete details.

Manasite Detonators are Included in the Atlas Rockmaster Blasting System

"ROCKMASTER"—Trade Mark; Manasite—Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES

"Everything for Blasting"

SAN FRANCISCO 4, CAL.

ATLAS POWDER COMPANY



SEATTLE 1, WASH.

GET 3-way PROTECTION with WINSLOW OIL CONDITIONERS

1 REAL CONDITIONING

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

2 THOROUGH FILTRATION

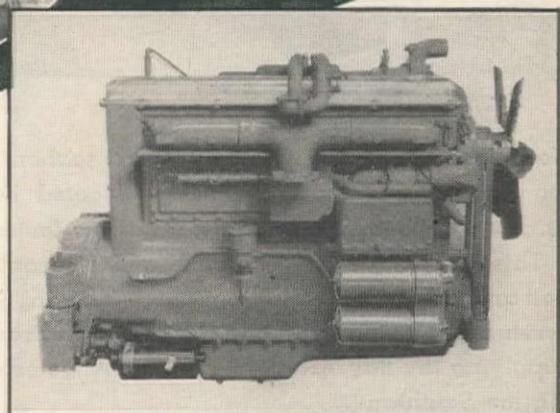
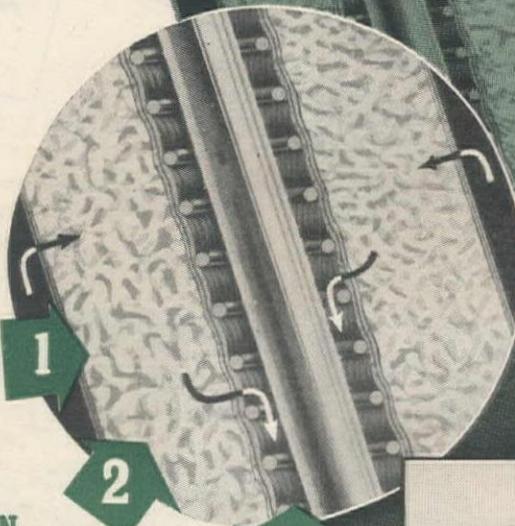
is accomplished by ingenious design features. Entire outside surface filters the oil, stopping large particles. Smaller grit is trapped as filtering channels narrow toward center, making full use of capacity. Winslow Elements do not remove the beneficial additives from modern compounded lubricating oils.

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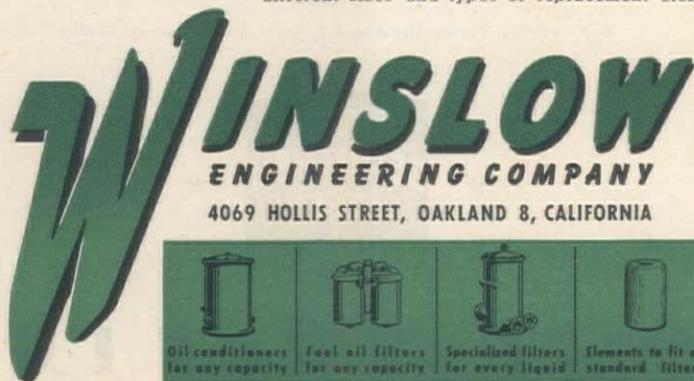
oil conditioning, pioneered and perfected by Winslow, allows only *conditioned* oil to reach wearing surfaces, brings oil into more frequent contact with elements for quicker removal of impurities. Fill out and mail the coupon today for details.

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

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



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



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

Please send me, without obligation, more information and descriptive bulletins on the complete line of Winslow Fuel Filters and Lube Oil Conditioners.

Name _____

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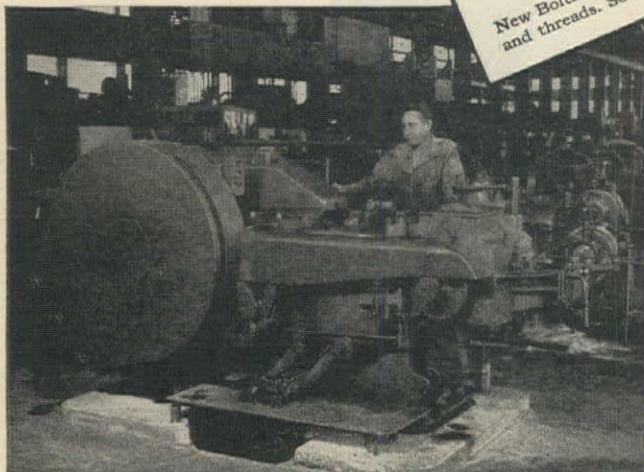
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TC-4701



IN THE NORTHWEST

New threading and pointing machines in bolt and nut plant at Seattle.



IN THE BAY AREA

New Boltmaker that upsets, trims, points and threads. South San Francisco.

Complete BOLT and NUT PLANTS

IN THE SOUTHLAND

Los Angeles plant. New machinery and general improvements are planned here.



No matter where a Western hardware jobber, building contractor or manufacturer is located he can bank on Bethlehem Pacific for all of his fastenings.

This company has 3 complete and self-contained bolt-and-nut manufacturing plants—one in Seattle serving the Northwest—one in South San Francisco supplying the Bay Area—one in Los Angeles covering the Southland.

Each of these plants has its own steelmaking facilities, its own rolling mills, its own drawing equipment, and its own heading-and-threading machinery. Each is operated by men who know every phase of the business, men who have helped develop the bolt-and-nut industry on the Pacific Coast.

Remember that Bethlehem Pacific fastenings are manufactured to rigid standards, are produced nearby, and come in a full range of styles and sizes.

Bethlehem Pacific Produces . . .

Bolts, nuts, rivets, track bolts, track spikes, pipe bands, plywood bolts, timber bolts, cut and rolled threaded rods, hot and cold forged specialties.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Honolulu

Bolt and Nut Plants: Los Angeles, South San Francisco, Seattle



BETHLEHEM PACIFIC

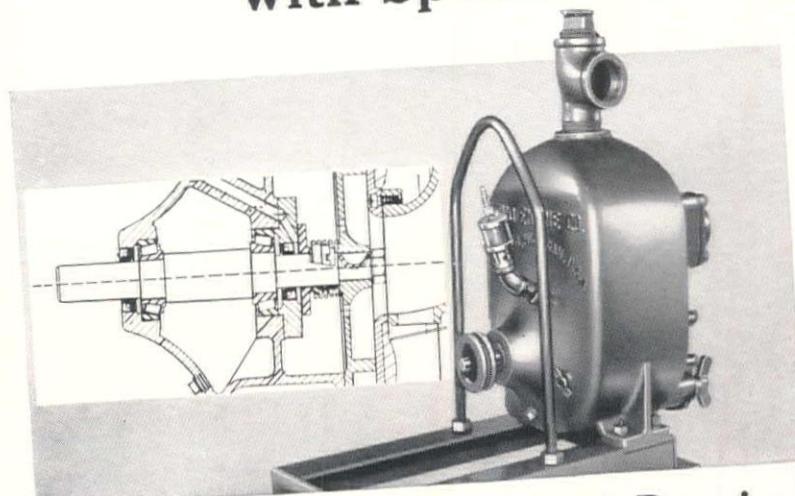
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Rochester—DEEDS EQUIPMENT CO.
IOWA
Cedar Rapids and Des Moines—GLOBE
MACHINERY & SUPPLY CO.
KANSAS
Topeka—MARTIN TRACTOR COMPANY
KENTUCKY
Louisville—NATIONAL EQUIPMENT CO.
Paducah—HENRY A. PETTER SUPPLY CO.
LOUISIANA
Baton Rouge, Monroe and New Orleans—
DUNHAM-PUGH CO., INC.
MAINE
Portland—EASTERN TRACTOR & EQUIP. CO.
Prairie Isle—ROY C. THOMPSON CO.
MARYLAND
Baltimore—MARYLAND SUPPLY & EQUIP. CO.
MASSACHUSETTS
Boston—PERRIN, SEAMANS & CO., INC.
MICHIGAN
Detroit—W. H. ANDERSON COMPANY, INC.
Grand Rapids—E. K. S. EQUIPMENT CO.
Marquette—MARQUETTE PUBLIC SERVICE
GARAGE, INC.
MINNESOTA
Duluth and St. Paul—BORCHERT
INGERSOLL, INC.
MISSISSIPPI
Jackson—WATKINS-ALDRIDGE
EQUIP. CO., LTD.
MISSOURI
Kansas City—CONTRACTORS SUPPLY CO.
St. Louis—MISSOURI-ILLINOIS TRACTOR &
EQUIPMENT CO.
MONTANA
Butte and Great Falls—MONTANA
HARDWARE CO.
NEBRASKA
Omaha—FEHRS TRACTOR & EQUIP. CO.
NEVADA
Reno—NEVADA TRUCK SALES
NEW JERSEY
Union—SMITH TRACTOR & EQUIP. CO.
NEW MEXICO
Albuquerque—HARRY CORNELIUS CO.
NEW YORK
Albany—SLADE TRACTOR & EQUIPMENT CO.
Buffalo—FOX EQUIPMENT CO.
New York—H. D. PENN MACHINERY CO.
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NORTH CAROLINA
Charlotte—CONTRACTORS SERVICE, INC.
NORTH DAKOTA
Fargo—MYHRA EQUIPMENT CO.
OHIO
Cincinnati—THE FINN EQUIPMENT CO.
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Columbus—BLAKE EQUIPMENT CO.
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EQUIP. CO.
Toledo—EDMUND SUPPLY CO.
OKLAHOMA
Oklahoma City—THE BOARDMAN CO.
OREGON
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Pittsburgh—BRINKER SUPPLY CO.
Wilkes-Barre—STANDARD EQUIPMENT CO.
SOUTH CAROLINA
Columbia—TIDEWATER SUPPLY CO., INC.
TENNESSEE
Knoxville and Nashville—DEMPSTER BROS.
Memphis—HOWELL EQUIPMENT CO.
TEXAS
Dallas—HI-WAY MACHINERY COMPANY
El Paso—DON A. CARPENTER CO.
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Lubbock—FRED BERRYHILL EQUIP. CO.
32nd Avenue—TOWERY EQUIPMENT CO.
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Salt Lake City—THE LANG CO., INC.
VERMONT
White River Junction—NOBLE-BEISLER
MACHINERY CO.
VIRGINIA
Norfolk and Roanoke—TIDEWATER
SUPPLY CO.
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Charleston—CLYDE W. BECKNER, INC.
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Milwaukee—STONE MANUFACTURING CO.
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Anchorage—NORTHERN ENGINEERING &
EQUIPMENT CO.

NOVO NEWS

OCTOBER, 1947

“Jerry-Rigging” Not Needed on Novo Pumps with Special Drives



No Bracket, No Outboard Bearing No Separate Lubrication Required

Novo “Pronto-Prime” self-priming centrifugal pumps are engineered specifically for use with belt, chain, or gear drives. Simply install a pulley or gear on the pump shaft and you're ready for work. This is possible because the “Pronto-Prime” impeller shaft is supported by two internal bearings lubricated from one oil reservoir. The construction makes it unnecessary to extend the pump shaft and use an adapter or bracket to house an outboard bearing, which must then be specially lubricated.

The Novo design is simpler, stronger, more durable, and less costly.

See your nearest Novo distributor for complete information on the “Pronto-Prime.”

Other Novo Equipment

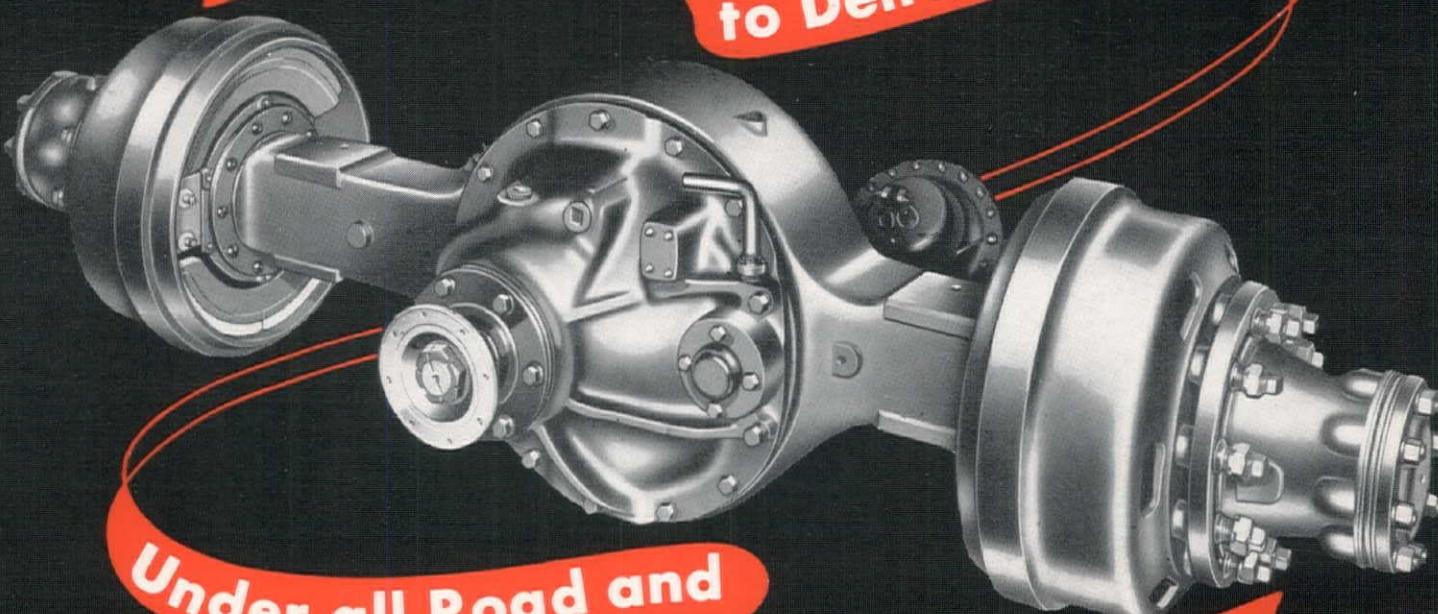
Novo contractors' equipment—backed by over 50 years of manufacturing experience—includes diaphragm pumps, pressure pumps, hoists, generator sets, air compressors, pavement breakers, engines, and the Scootruk—the new, amazing mechanized wheelbarrow.

NOVO

ENGINE COMPANY
LANSING, MICH. U.S.A.
CONTRACTOR'S EQUIPMENT
· GRAY IRON CASTINGS ·
ENGINES



Allied Member of A.E.D.



POWER and SPEED

to Deliver the Load

Under all Road and

Traffic Conditions

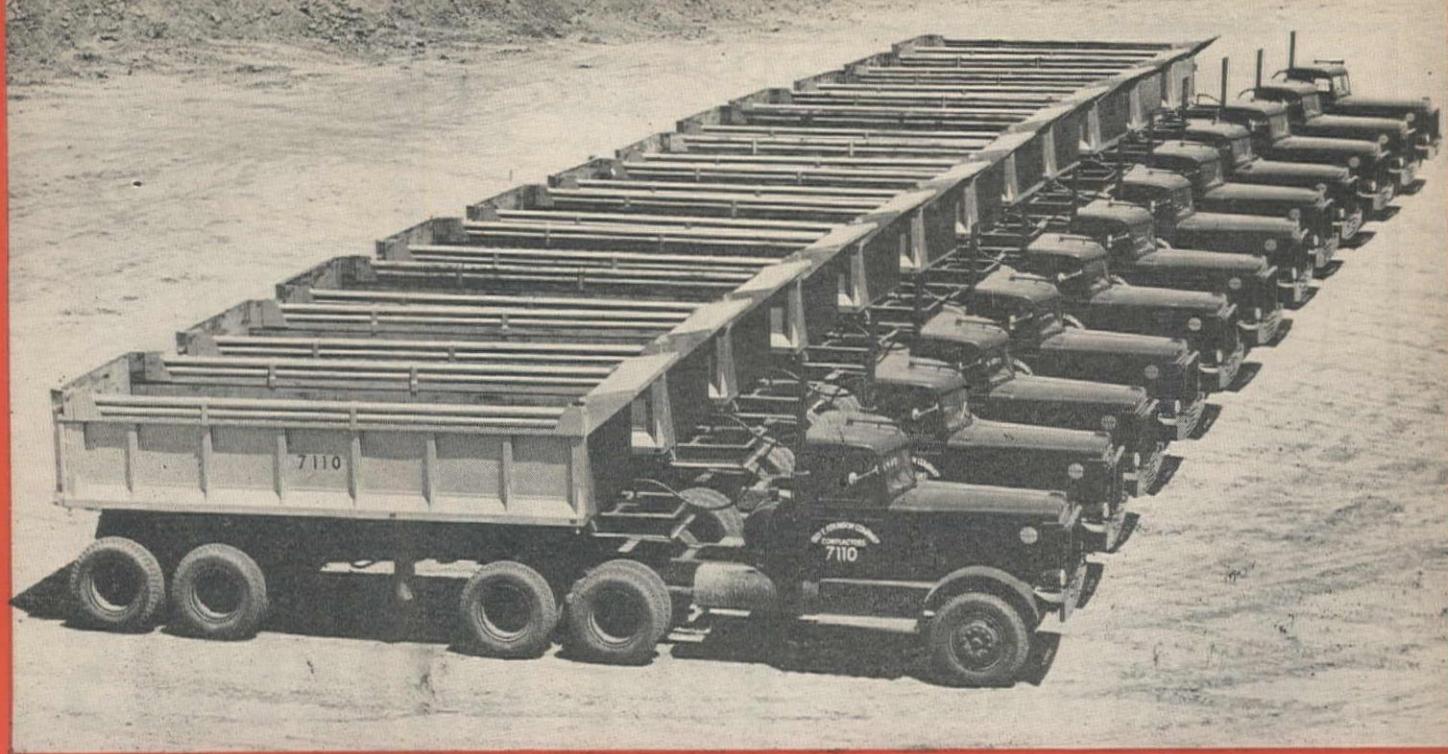
EATON 2-SPEED *Truck* AXLES

MORE THAN $\frac{3}{4}$ OF A MILLION EATON 2-SPEED AXLES IN TRUCKS TODAY

EATON MANUFACTURING COMPANY

Axle Division

CLEVELAND, OHIO



42 PETERBILTS ON MILLS FIELD FILL



At top, twelve new Peterbilts recently delivered to Guy F. Atkinson Company, and below, the fleet of thirty Peterbilts which Atkinson purchased from another contractor.

Here are the 42 PETERBILTS being used by Guy F. Atkinson Company of San Francisco to haul the fill which will cover approximately 300 acres of tide lands for the expansion of San Francisco's twenty million dollar airport.

Here is a job that is being handled according to the finest traditions of American contracting. Millions of cubic yards of earth are being moved—all of it over a specially built private road from the pit to the job—with no interference with either highway or railway traffic.

Here is a job on which earth moving records have already been shattered, and now, with an augmented fleet of PETERBILTS—watch the dirt fly.

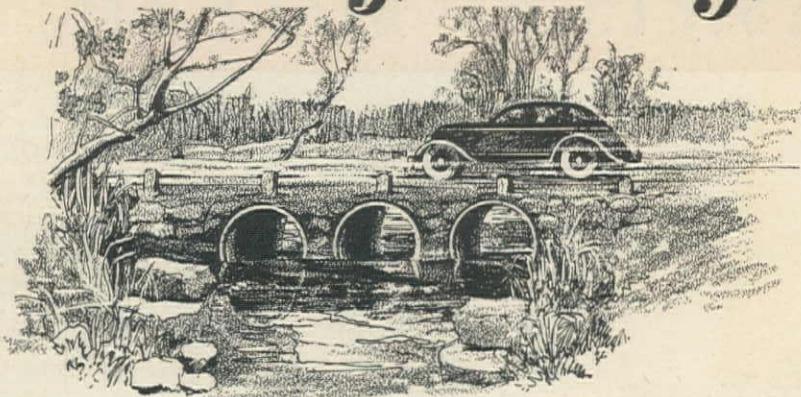
Peterbilt Motors Company

07th AVENUE AND MacARTHUR BOULEVARD · OAKLAND · CALIFORNIA

*Replace old
Bridges
with*

REINFORCED CONCRETE PIPE CULVERTS

for Durability, Economy, Strength-



More and more old bridges are being replaced with reinforced concrete pipe culverts. Quickly installed, they minimize traffic detours—one-half of the roadway is in service while the pipe is being laid under the other. Economical extensions can be made easily and quickly when the roadbed is widened.

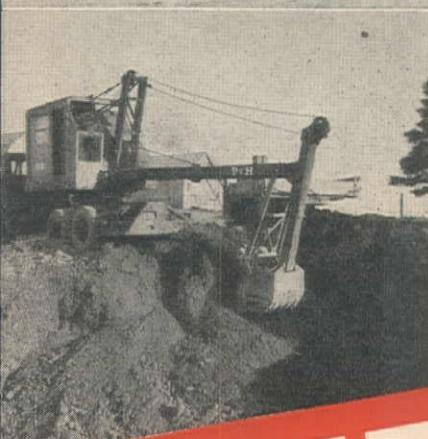
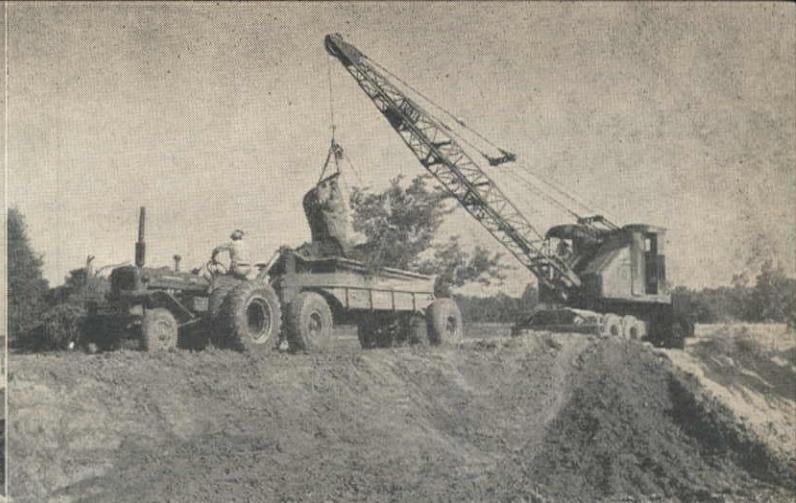
Durable reinforced concrete pipe culverts—built to withstand constant loads of heavy traffic—assure you perman-

ent installations. You get maximum structural strength, maximum hydraulic capacity, plus the assurance of long and faithful life of service.

Specify reinforced concrete pipe culverts on your jobs—they pay big dividends in economy, strength, and durability. Write for specifications, literature, special information and names of manufacturer members of—

**CALIFORNIA ASSOCIATED
CONCRETE PIPE
MANUFACTURERS**
P.O. BOX 152
FRESNO 7
CALIFORNIA





P&H TRUCK CRANES

FOR ALL KINDS OF JOBS ALL OVER THE MAP!

Fast to the job—fast to finish it . . . that's the Johnnie-on-the-spot kind of service that makes extra profits for owners of P&H Truck Cranes.

They're dual-powered! You travel with an engine *built* for travel—across town or across the state, you get there quickly at normal traffic speeds. And you work with an engine *built for work*. There's no compromise—no sacrifice of ability. It's the way to cover a bigger area—and a wider range of work—more profitably. Available as crane, shovel, dragline, clamshell, hoe, and piledriver—readily interchangeable. Get set for the busy years ahead. Get the best unit money can buy. Write for literature.

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HARNISCHFEGER CORPORATION: SAN FRANCISCO, Calif., 82 Beach Street

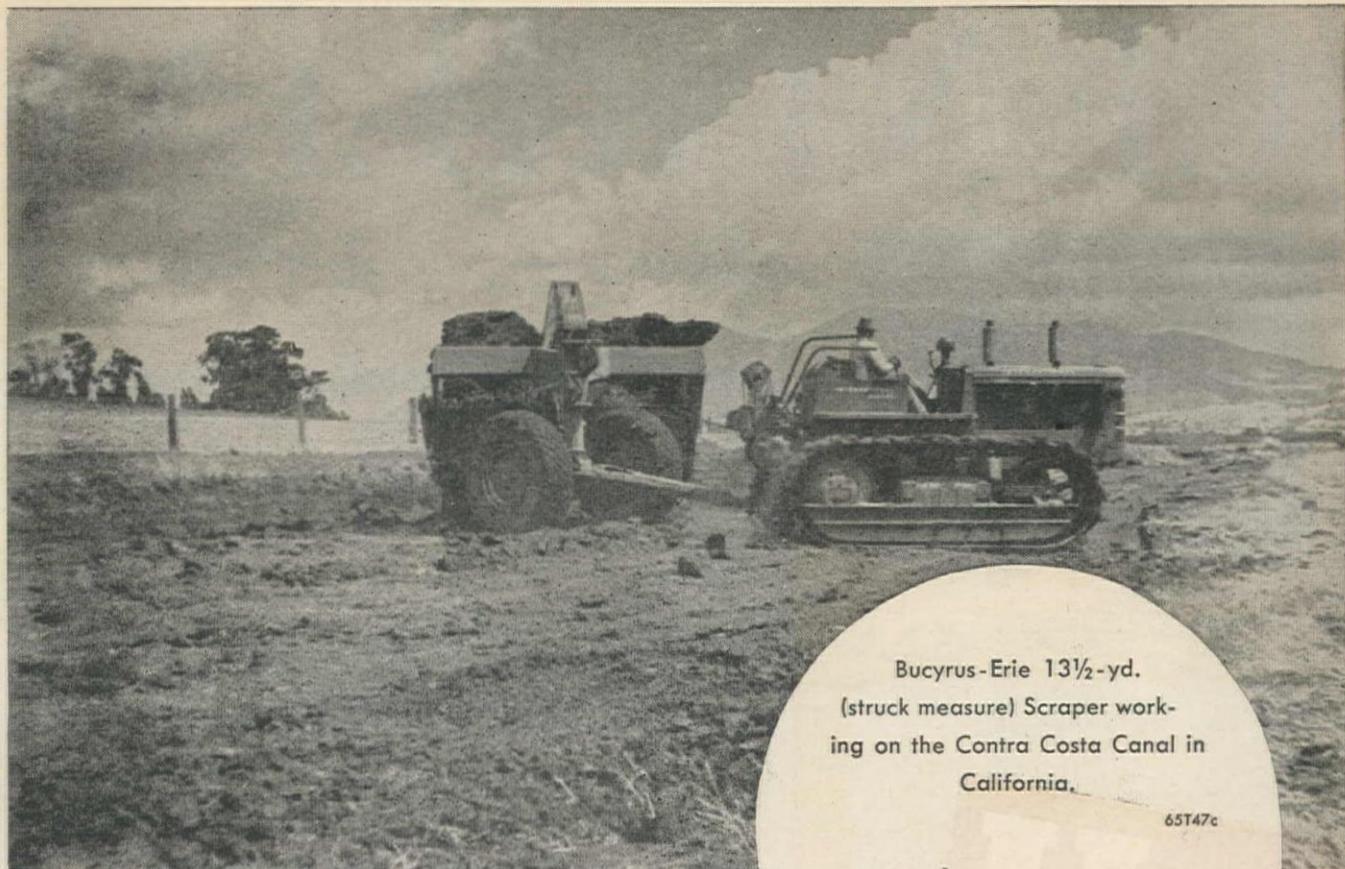
Warehouses Service Stations: SEATTLE, LOS ANGELES, SAN FRANCISCO

PORLAND 14, Oregon, Loggers & Contractors Machinery Co., 240 S.E. Clay St.; WILLOWS, Calif., Willows Motor Sales Co.; BAKERSFIELD, California, Kern Tractor & Equipment Co., 24th & N. 99 Highway, P. O. Box 1695; NAPA, California, Berglund Tractor & Equipment Co., 1016-18 Soscol Ave.; SALT LAKE CITY 1, Utah, National Equipment Co., 101 West, Second St., So.; BOISE, Idaho, Olson Manufacturing Company, 2223 Fairview Ave.; EL CENTRO, California, Faure Tractor & Equipment Company, 1414 Main St.; FRESNO, California, Allied Equipment Company, 1824 Santa Clara St.; SAN DIEGO, California, Southern Equipment & Supply Co., 668 Third Ave.; SPOKANE 8, Washington, F. M. Viles & Co., Inc., East 124 Trent Ave.; RENO, Nevada, Denison Tractor & Supply Company, 559 East Fourth St.; SEATTLE 4, Washington, Glenn Carrington & Co., 91 Columbia St.

P&H REMOTE CONTROL AVAILABLE

With this unit you can control all carrier functions (even the horn) by electric push-buttons — from the operator's position inside the crane cab.





Bucyrus-Erie 13 1/2-yd.

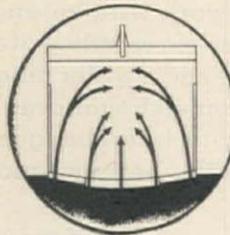
(struck measure) Scraper working on the Contra Costa Canal in California.

Efficient Earth Moving Starts At the

DOUBLE CURVE BLADE



● Efficient earth moving with Bucyrus-Erie 2-and 4-wheel scrapers begins at their double-curve blades. The concave cross-section "boils" dirt up easily into the bowl, heaping it up without loss of effort in pushing against the entire dirt load. This boiling action also breaks up lumps and fills voids, for a fuller load of more uniform density.



● The cross-wise bowing, with the weight of the scraper concentrated at the center of the blade, quickly penetrates the earth and directs dirt toward the center of the bowl to reduce the sidewall friction that slows down loading.

But efficient earth-moving doesn't stop at the blade with Bucyrus-Erie Scrapers. Let your distributor tell you about their short turning radius for maneuvering in narrow limits, their low center of gravity for clinging safely to slopes and grades, and their many other advantages that mean economical earth moving. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

See Your INTERNATIONAL Industrial Tractor Distributor

ARIZONA: John P. Duncan, Yuma; Flagstaff Implement Co., Flagstaff; The Lines Co., Safford; Northern Arizona Supply Co., McNary; F. Ronstadt Hardware Co., Tucson; The O. S. Stapley Co., Phoenix. CALIFORNIA: Allied Equipment Co., Fresno; Madera & Reedley; Bay Cities Equipment Co., Inc., Oakland; Braman-Dickerson Co., Riverside; Edgar-Purdy Co., El Centro; M. Eltiste & Co., Inc., Santa Ana & Anaheim; Exeter Mercantile Co., Visalia & Exeter; Farmers Exchange, Alturas; Farmers Mercantile Co., Salinas, Hollister, King City & Watsonville; Gallagher Tractor & Impl. Co., Merced; Edw. F. Hale Co., Hayward; Hanson Equipment Co., Santa Maria; Kern County Equipment Co., Bakersfield & Wasco; L. G. Maulhardt Equipment Co., Oxnard; Sacra-

mento Valley Tractor Co., Sacramento; Smith Booth Usher Co., Los Angeles; Southern Equipment & Supply Co., San Diego; Stanislaus Implement & Hdwe. Co., Modesto; Stevenson Equipment Co., Santa Rosa; Thompson-Sage, Inc., Stockton, Lodi & Tracy; Valley Equipment Co., San Jose. IDAHO: Intermountain Equipment Co., Boise & Pocatello. NEVADA: Brown Truck & Equipment Co., Reno; Clark County Wholesale Mercantile Co., Inc., Las Vegas. NEW MEXICO: Hardin & Coggins Co., Albuquerque. OREGON: Howard-Cooper Corp., Portland & Eugene. UTAH: The Lang Co., Inc., Salt Lake City. WASHINGTON: Howard-Cooper Corp., Seattle; Intermountain Equipment Co., Spokane. WYOMING: Wilson Equipment & Supply Co., Cheyenne & Casper.

TRACTOR

**BUCYRUS
ERIE**

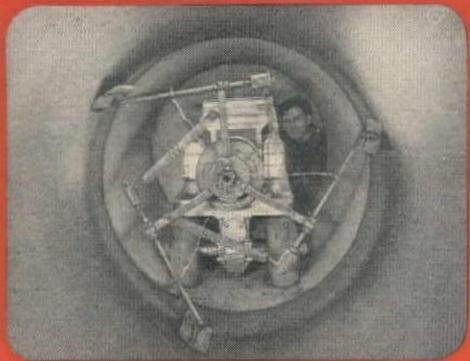
EQUIPMENT

TE-3

CENTRILINE



BEFORE—Typical example showing incrustation and tuberculation inside of water main.



AFTER—Centriline process includes scientific cleaning and application of cement-mortar lining.



COMPACT SERVICE UNIT—Typical American mobile unit, compact and complete for on-the-job service.

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, Calif.

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Oakland San Diego Portland, Oregon

cement-mortar lining of water mains

... a service of
American
PIPE AND CONSTRUCTION CO.

in the Western States

When metal water mains lose efficiency, Centriline service by American may solve your problem. A rapid, economical method of reconditioning such pipe lines, the Centriline process is performed underground—in place. After cleaning the pipe, a thoroughly premixed cement-mortar lining of desired thickness is applied centrifugally without rebound. This dense, quality product is then mechanically trowelled to form a smooth, durable surface.

The Centriline process means distinct advantages to you, because it—

- Restores and maintains maximum hydraulic capacity.
- Prevents interior corrosion and tuberculation.
- Provides effective sustained service; offers a real economy in its application.
- Is accomplished rapidly, minimizing inconvenience to surface traffic.

The American Pipe and Construction Co. 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 are available to water works officials and engineers.

Write for more detailed information concerning the remarkable Centriline Process.

**Centriline Division of
AMERICAN PIPE AND CONSTRUCTION CO.**

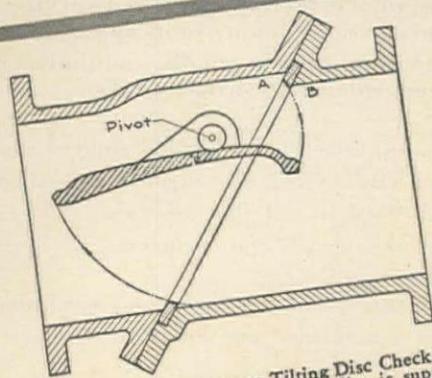
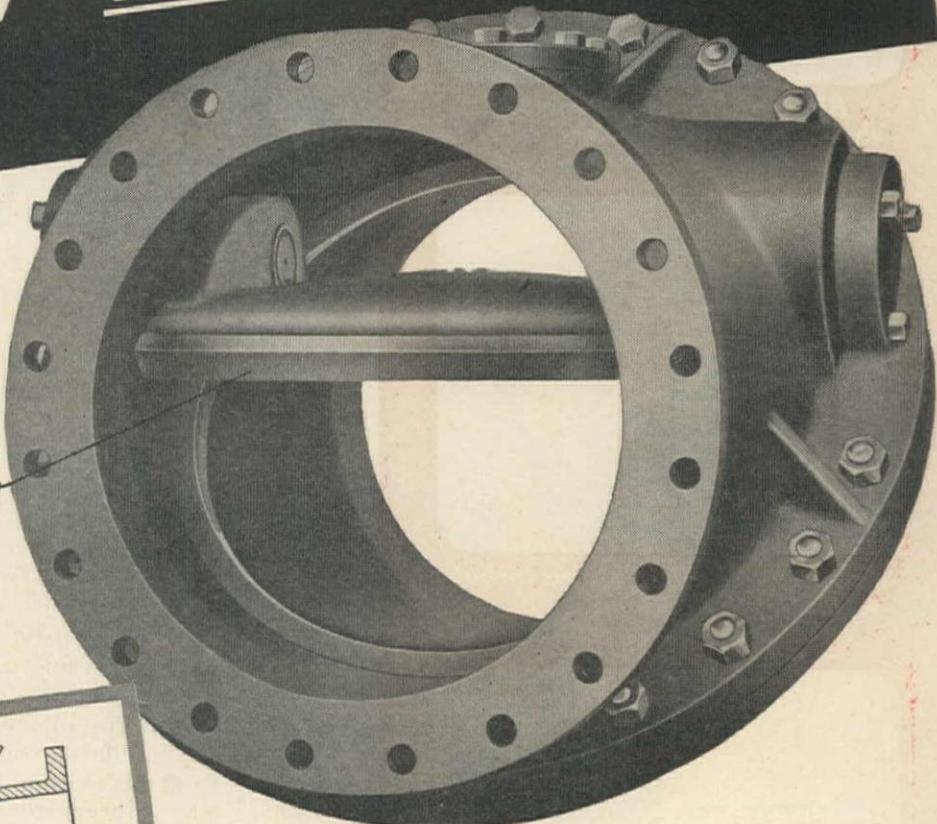
Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines

P. O. Box 3428 • Terminal Annex • Los Angeles 54, California
Phone: JEFFerson 4211

CHAPMAN CHECK VALVES

Close Seat  **WITHOUT SLAMMING**
WITHOUT RUBBING

ONLY
ONE MOVING
PART!



Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.



Chapman Tilting Disc Check Valves are made in iron and steel. Send for bulletin.

Chapman Tilting Disc Check Valves are *different* in design. Unlike ordinary swing check valves, they have a balanced hinge-pinned disc which works with the stream. The disc closes *quickly* and *quietly* because of the cushioning effect of the stream against the short flap of the disc. This prevents slamming and the resultant pipe-line stresses.

On opening, the disc seat *lifts away* from the body seat without rubbing; when closing, it drops freely in place. Also the disc rides smoothly on the flow of the stream, minimizing wear on bearings and hinge pins.

Maintenance costs are cut, and head losses are reduced as much as 65% to 80% over those experienced with conventional type check valves. And when installed on pump discharge lines, substantial power savings are effected.

The CHAPMAN Valve Mfg. Co.

INDIAN ORCHARD, MASS.

**When Tractor
and Equipment
are ONE Machine**

It's an INTERNATIONAL



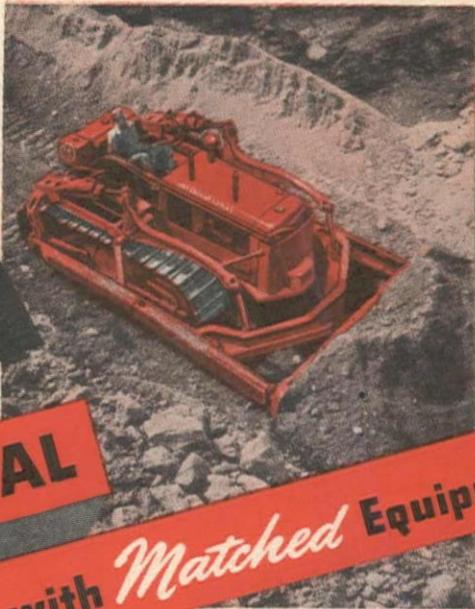
TD-18 with Isaacson Kable Trac-dozer



TD-18 with Bucyrus-Erie Cable Bullgrader



TD-14 with Isaacson
Hydraulic Trac-dozer



TD-18 with Bucyrus-Erie
Hydraulic Bullgrader

When you buy an International Crawler and matched bulldozer from your International Industrial Power Distributor you get a completely integrated machine. All the equipment shown in the photographs has been designed by its manufacturer to meet the requirements established by International engineers.

Each bulldozer provides the benefits of its maker's long experience in building earth-moving equipment plus the features that make it an integral part of the International tractor for which it was built.

This means that your International Crawler and equipment becomes *ONE efficient machine* for economical, profitable work.

You cannot find a better buy. It's the perfect combination of specialized power and specialized equipment.

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



TD-14 with Heil
Trailbuilder

INTERNATIONAL POWER
CRAWLER AND WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS

October, 1947—WESTERN CONSTRUCTION NEWS



"That new Rex Tilter sure is a money-maker!"

You'll mix more yards per day . . . concrete or mortar . . . make more profit per job with a new Rex Tilting Mixer. It's the greatest money-maker you've ever seen.

Note these time-saving, job speeding features. Perfect balance with low center of gravity and 62-inch wheel spread for fast, safe towing. Easy rolling pneumatic-tired wheels mounted with Timken bearings plus accurate balance make it easy for one man to spot the mixer. Four-point suspension assures stability while mixing . . . no "teetering" or shifting.

Two-position loading . . . you can bring the barrow straight to the drum, head-on or sideways without interference. Fast, thorough mixing action and convenient controls. Long-lasting, all-welded, pressed steel drum bowl. Dependable, economical power plant. Complete lubrication from the outside.

Add them up, you'll see why you get more of everything . . . service, long life, dependability and profit . . . with the new Rex 3½ S Tilter. Conforms with A.G.C. Standards—for your protection. For facts, see your local Rex Distributor.

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BROWN-BEVIS EQUIPMENT CO.
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CONSTRUCTION EQUIPMENT CO.
CONTRACTORS EQUIPMENT AND SUPPLY CO.
RAY CORSON MACHINERY CO.
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LOGGERS & CONTRACTORS MACHINERY CO.

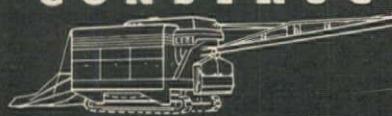
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Phoenix, Arizona
Spokane, Washington
Albuquerque, New Mexico
Denver, Colorado
Butte, Montana
16826 Pacific Highway, Seattle 80, Washington
Cheyenne, Wyoming
Oakland 3, California
Boise, Idaho
Portland, Oregon



CONSTRUCTION MACHINERY



PUMPS



PAVERS



PUMPCRETES



MOTO-MIXERS

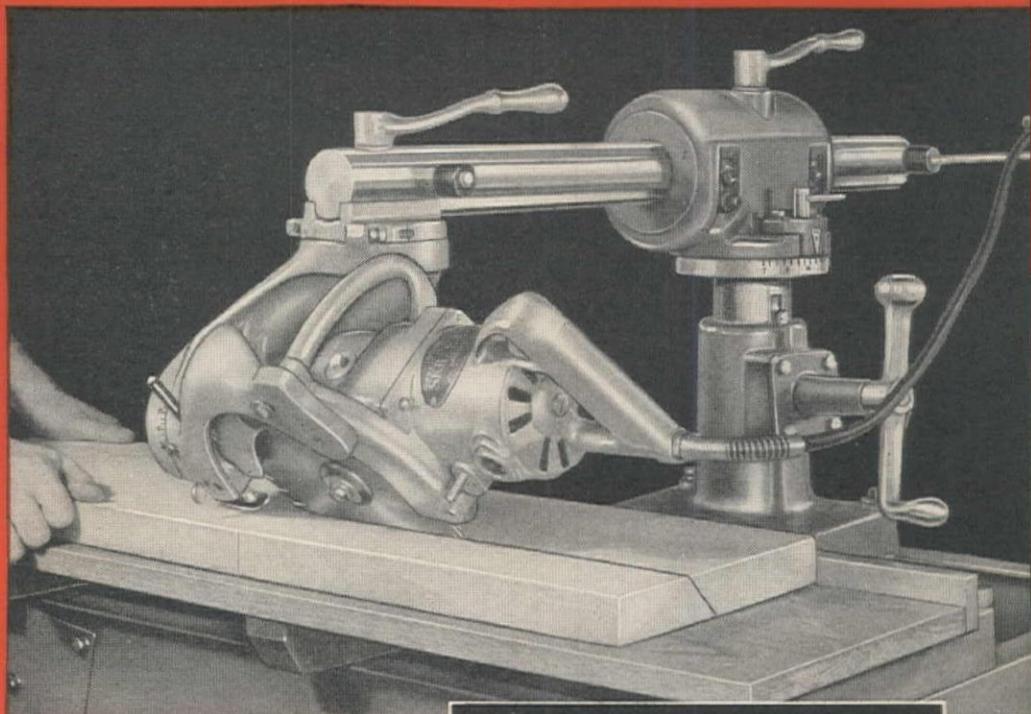
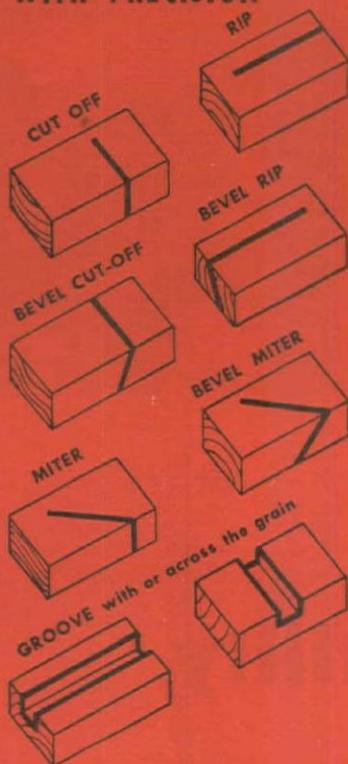


MIXERS

MULTIPLY YOUR SKIL SAW'S MANY USES with a SKIL SAW RADIAL SUPPORT

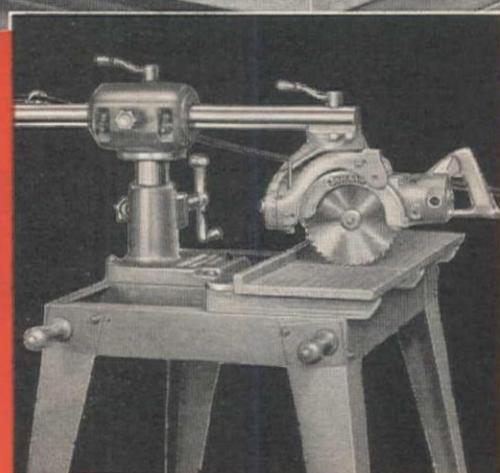
*Quickly Converts Portable Electric SKIL SAW**
into an Efficient Radial Saw

MAKES ALL THESE CUTS
WITH PRECISION



SKILSAW Radial Support may be had
with or without steel legs.

• Every SKILSAW owner knows that this portable electric saw is tops for cutting wood, metal, stone or compositions accurately . . . free hand. Now you can add precision on multiple cuts simply by slipping your SKILSAW into a Radial Support . . . you make the conversion quickly and easily. If you are interested in cutting big costs on any job, you ought to call your SKITOOL Distributor today for additional information on SKILSAW Radial Support!



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* SKIL SAW is made only by SKILSAW, INC.

ELECTRIC PNEUMATIC
SKILTOOLS



MADE BY SKILSAW, INC.



As a CLAMSHELL . . . backfilling the trench after setting the tile—proof of Insley's versatility on the job.



As a CRANE . . . setting concrete tile on a storm sewer project. Note clamshell bucket set aside for this operation.

I

evidence . . .
job versatility



For full details request our New Specification Book

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CONSTRUCTORS EQUIPMENT CO. 3707 Downing St., Denver 5, Colorado

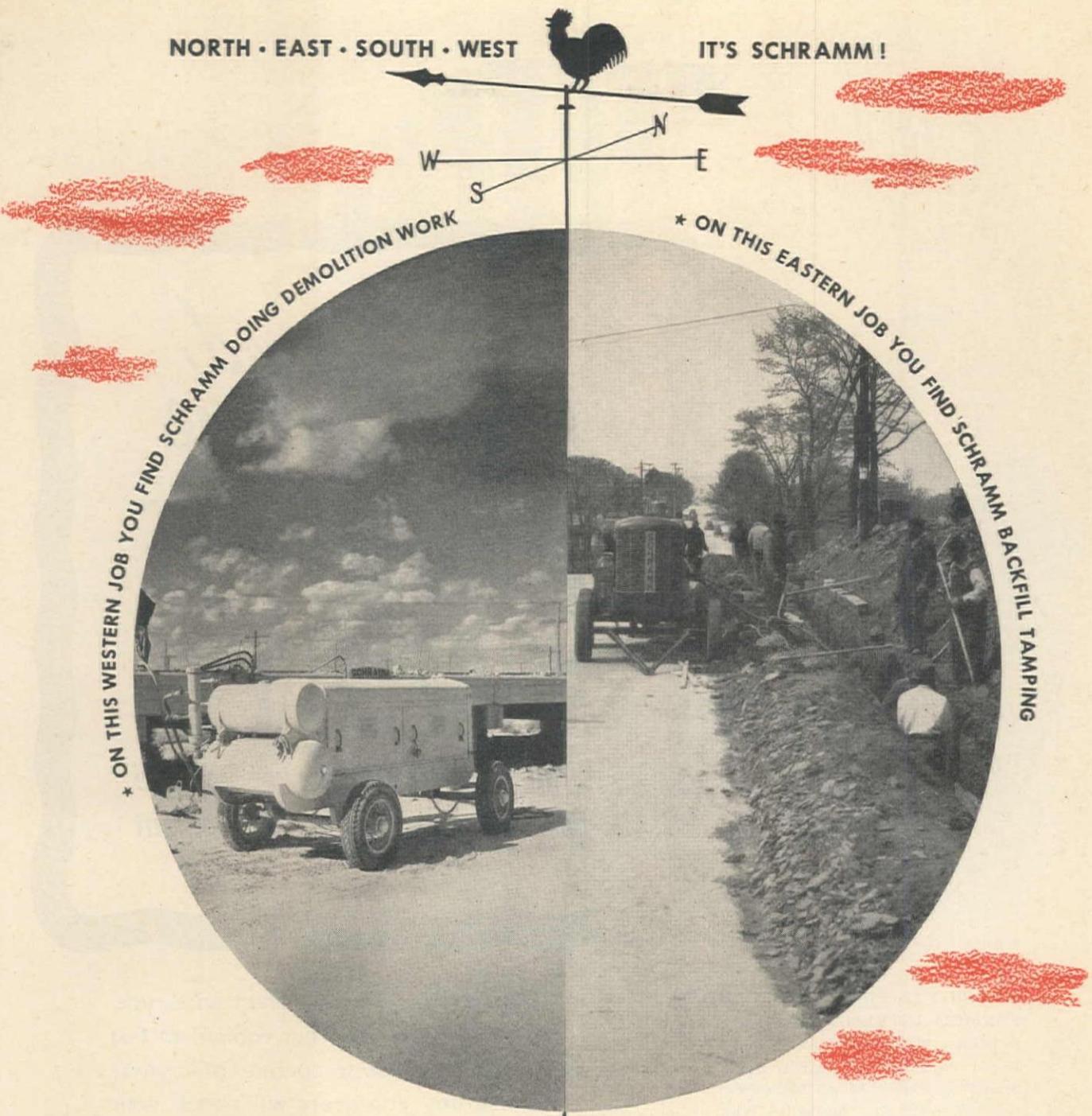
M. & F. EQUIPMENT CO. Route 1, Box 246A, Albuquerque, N. M.

H. H. NIELSEN COMPANY 541 W. 2nd South, Salt Lake City 1, Utah

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IT'S SCHRAMM!



Here's why you find

Schramm is the air compressor that can furnish you air anywhere—any time you want it. No matter how hard the construction job, Schramm is designed to meet your requirements.

Every Schramm is lightweight, compact, easy to move about. It has such desirable features as 100% watercooled...mechanical intake valve...main bearings for every cylinder...more cylinders

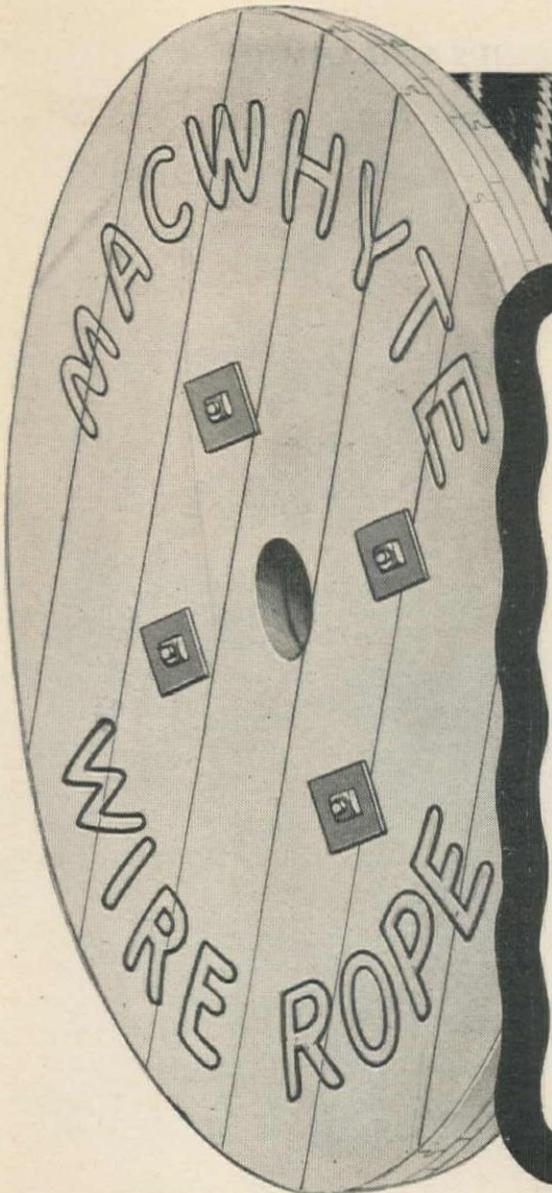
Schramms everywhere

and lighter parts...and forced feed lubrication. These features make Schramm adaptable for work summer and winter, with no let-up. Moreover, these features offer advantages wherever Schramm is used—which is North, East, South and West. We invite you to write today for full details on Schramm Air Compressors, Portable and Stationary. Schramm makes your construction job easier.

THE COMPRESSOR PEOPLE

SCHRAMM INC.

WEST CHESTER, PENNA.



*a thousand
and one*
**MACWHYTE
WIRE ROPES**

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

MACWHYTE PREFORMED AND NON-PRE-
FORMED INTERNALLY LUBRICATED WIRE
ROPES...MONARCH WHYTE STRAND Wire
Rope...Special Traction Elevator Rope...Stainless
Steel Wire Rope...Monel Metal Wire Rope...Galva-
nized Wire Rope...Spring-lay Wire Rope...Atlas
Braided Wire Rope Slings, Hi-Fatigue Aircraft Cables,
Assemblies and Tie-Rods. Catalogs on request.

NO. 923

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MACWHYTE
your headquarters for
WIRE ROPE
and **SLINGS**

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

MACWHYTE WIRE ROPE

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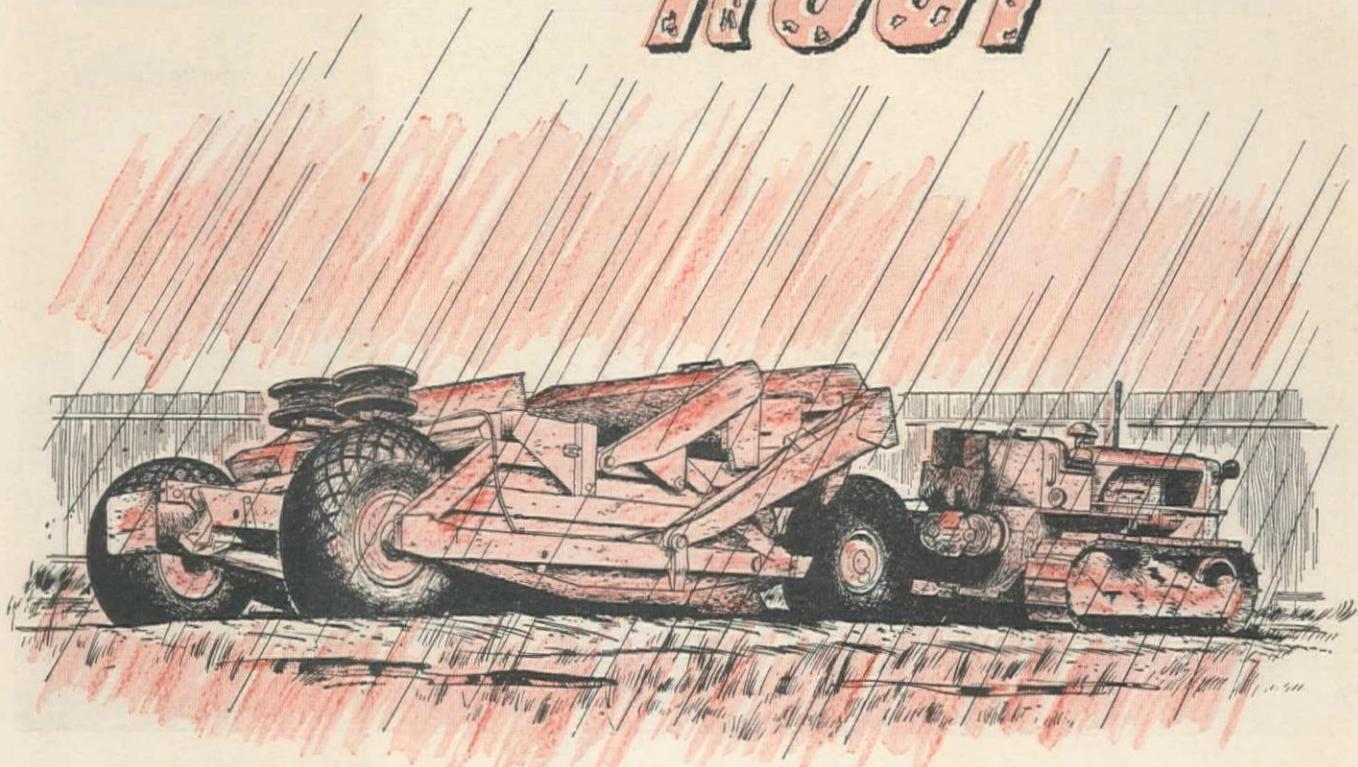
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Distributors throughout the U.S.A. and other countries

Lay-up time is

RUST time



Next spring—how much will you have to charge off to rust?

Shell offers you a simple, low-cost plan for keeping your equipment rust free—and ready to go when you need it

EXPENSIVE overhauls that could have been avoided . . . high-paid crews idled by equipment out of commission . . . inefficient work from rust-damaged tools. Those are just some of the ways that rust can steal from you.

Don't put up with such robbery. Keep rust's thieving hands off your equipment—with Shell Ensis Rust Preventives.

Shell Ensis products keep a rust-resistant coating on metal surfaces—*keep it on even through months of outdoor storage*. Use Ensis on any equipment sub-

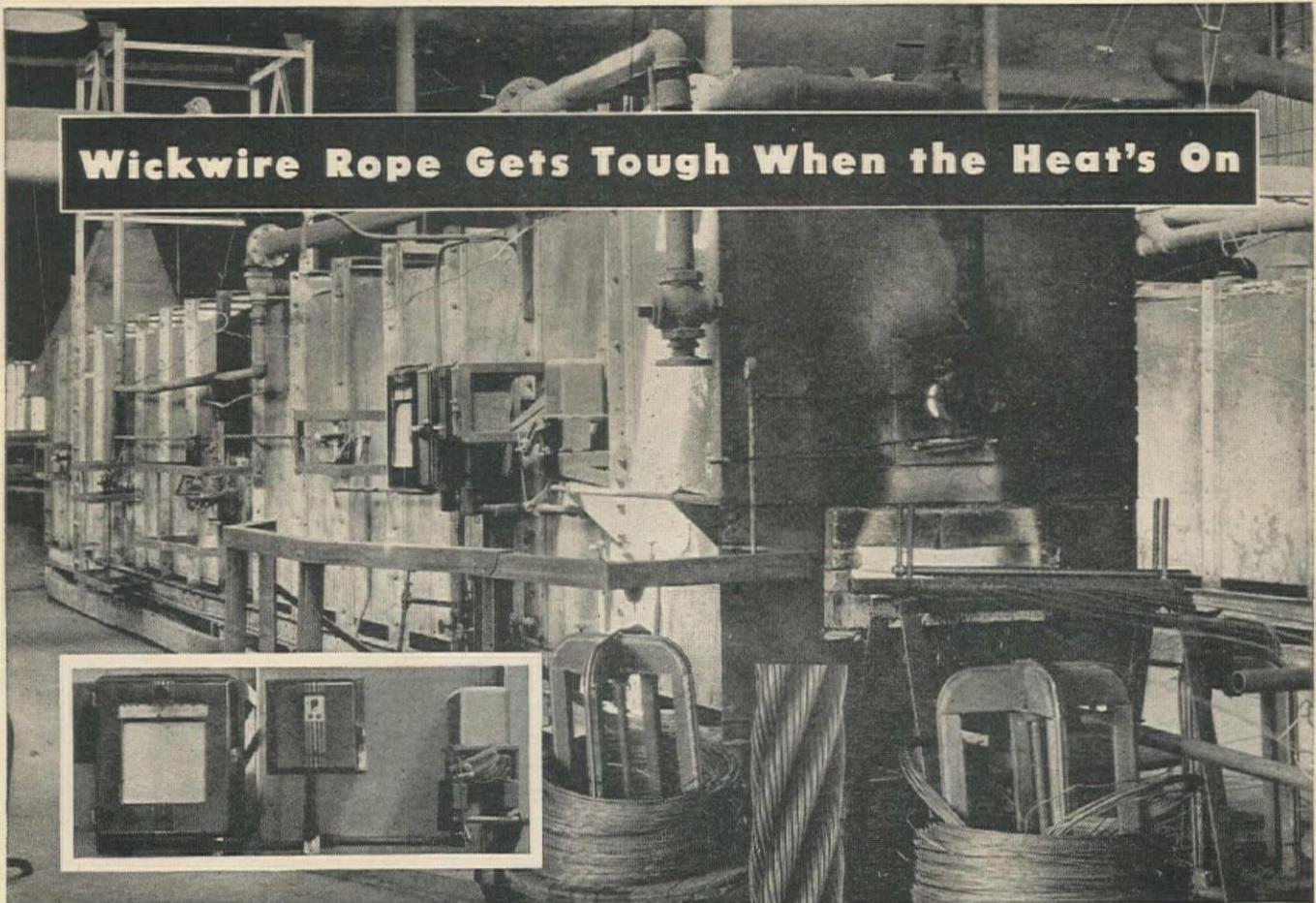
ject to rust damage—externally, for instance, on cables, sheaves, small tools, air drills, spare parts, ratchets, exposed gears and bearings. Apply by dipping, spraying or brushing on at normal temperatures.

For preventing rust inside idle engines, all you have to do is drain the regular oil and replace with a 400-series Ensis Oil. This grade is completely soluble in lubricating oil and need not be removed when the unit goes back in service.

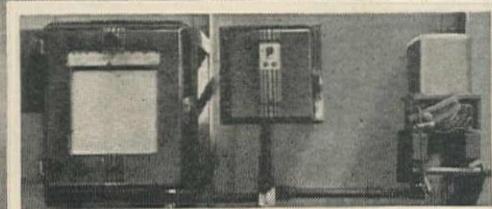
In a fraction of the time it takes to clean off rust—and for a fraction of what rust can cost you—you can keep your equipment rust free and ready to go with Ensis products. See the Shell man for this important protection during the lay-up season.

SHELL ENSIS RUST PREVENTIVES





Wickwire Rope Gets Tough When the Heat's On



Traveling through a fiery patenting furnace changes the microstructure of high carbon steel—removes the effect of cold drawing, permits further processing and makes rope wire exceedingly strong and tough.

Temperature and rate of cooling have an important bearing on the size of grains developed in patenting, and grain size determines to a large degree, the physical properties of the wire. That's why the patenting furnaces at Wickwire's newly enlarged Rope Mill have controls so accurate that, even when operating at 1700°F., they anticipate a 5° drop or rise in temperature and automatically regulate the burners.

Accurate patenting temperature is one of many quality controls used in making Wickwire Rope. Because it contributes to rope strength and toughness, it is as important to you as the service of Wickwire distributors and rope engineers who are always ready to help solve your wire rope problems and to supply the right rope for your needs.

For the utmost in performance, safety and long life, specify Wickwire Rope. It is available in all sizes and constructions, both regular lay and WISSCOLAY Preformed.

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ON WIRE ROPE IS FREE
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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, Massachusetts.

WICKWIRE ROPE

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

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass.

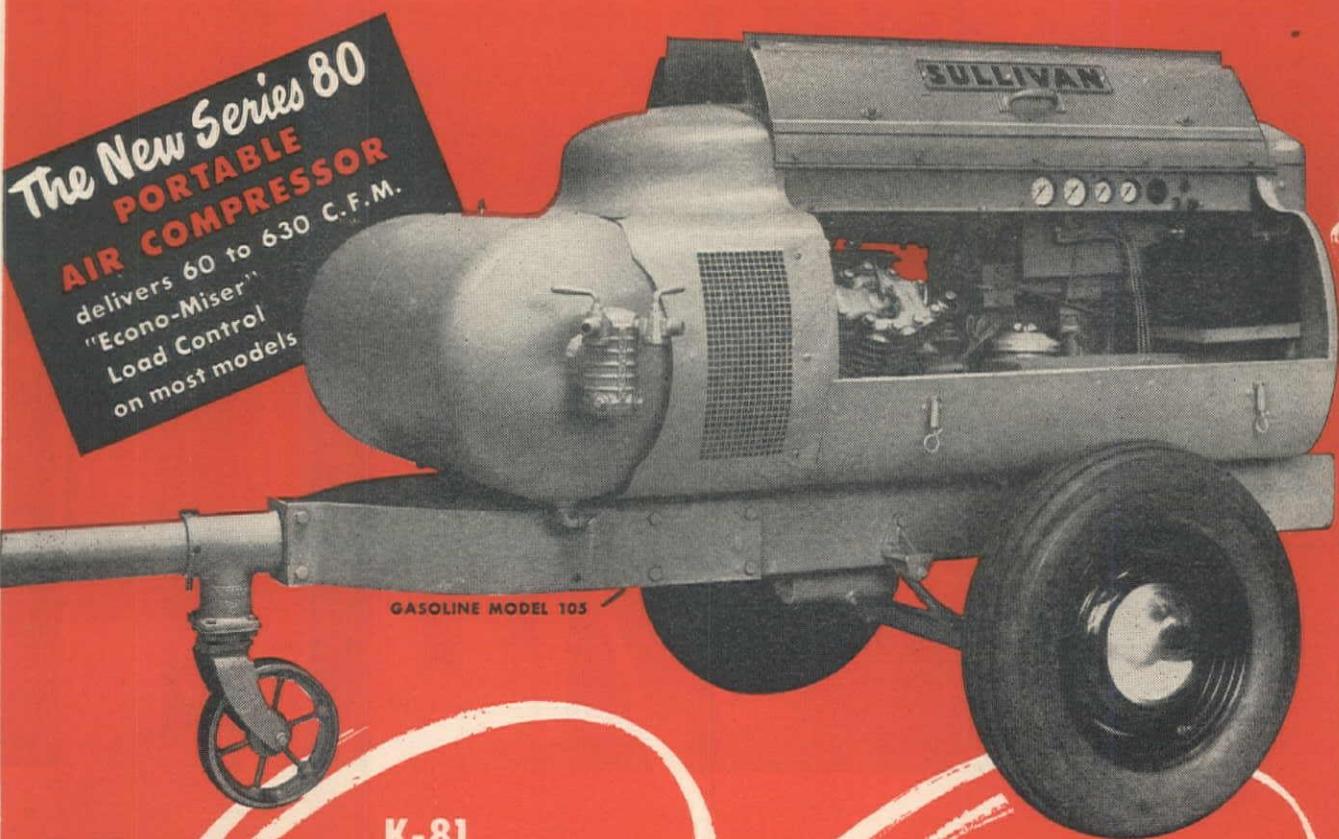
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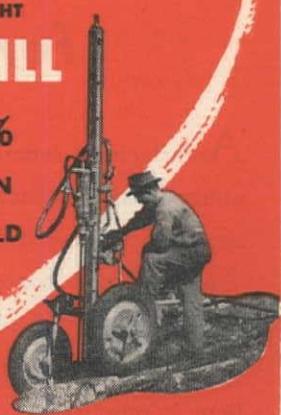


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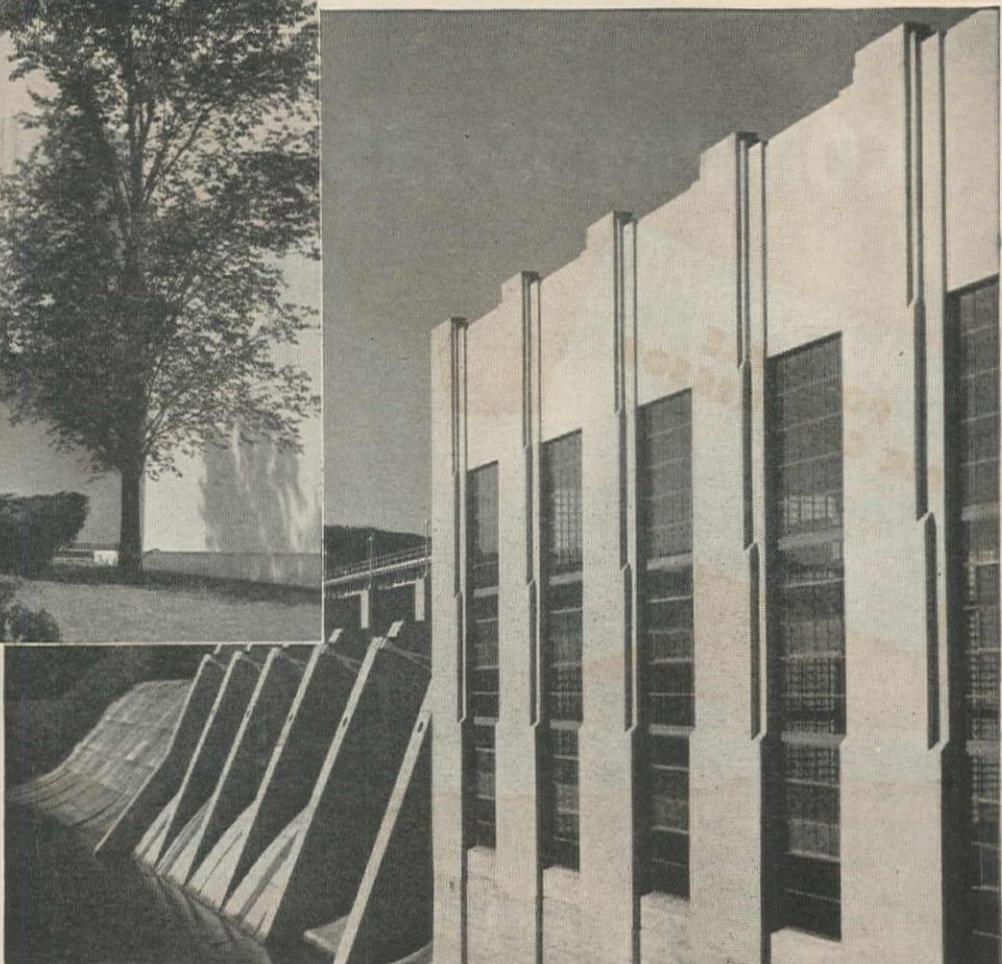
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Architectural concrete is especially well suited for utility buildings. Such concrete structures retain fine appearance through years of hard service.

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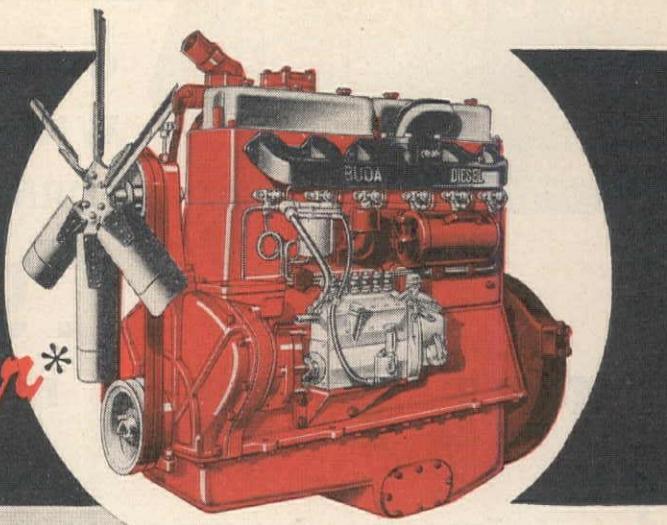
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A STUDY of "Survival and Retirement Experience With Water Works Facilities" in 25 cities has recently been completed. The facilities studied included cast iron distribution mains.

The 25 cities, with a total population of nearly 7 million, have installed more than 55 million feet of cast iron mains. The first of these mains was laid in 1817.

A report recently published by the American Water Works Association* includes individual tables for each city showing in detail the amount of cast iron pipe laid by sizes, the amount still in service, and the year of the first installation.

A combined tabulation of the 25 tables reveals a remarkable experience with cast iron distribution mains. In these 25 cities, more than 96 per cent of all cast iron mains in sizes 6 inch and over, that have ever been laid are still in service.

With the permission of the A.W.W.A. we have reprinted the facts as they apply to cast iron pipe in a brochure "Survival and Retirement Experience With Cast Iron Water Mains." If you have not received a copy, write us. Cast Iron Pipe Research Association, Thos. F. Wolfe, Engineer, Peoples Gas Bldg., Chicago 3, Illinois.

*Available from American Water Works Association, 500 Fifth Ave., New York.

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SERVES  FOR CENTURIES

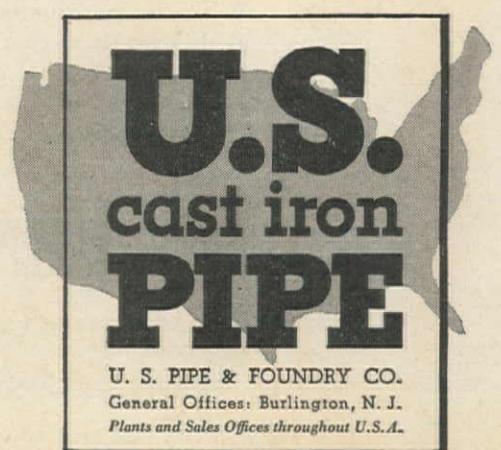
LOOK FOR THIS MARK

IT IDENTIFIES CAST IRON PIPE



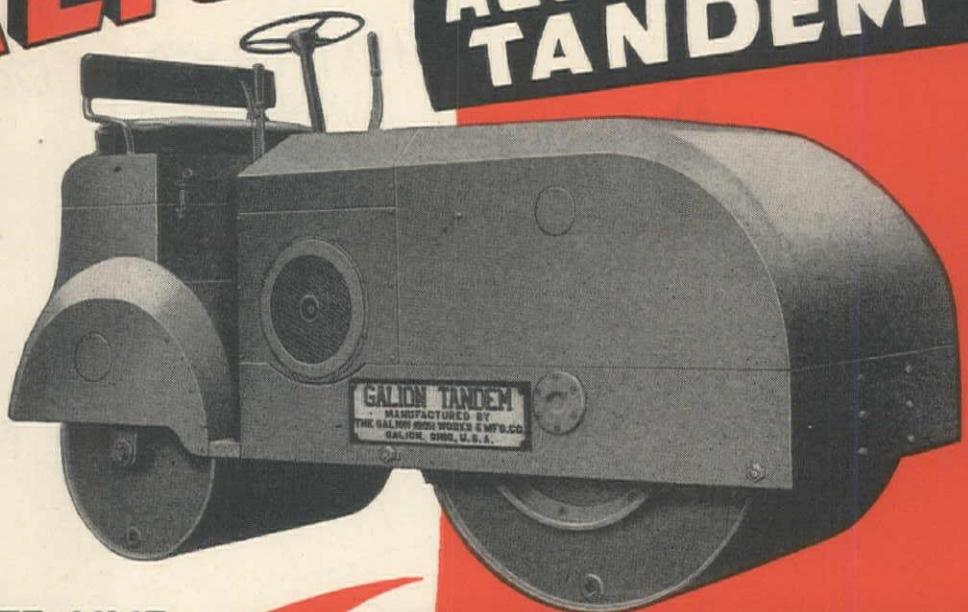
Original Woodcut by Lynd Ward

October is the month when many farmers can take a deep breath and relax a bit. Not so in a pipe foundry. We must continue month after month to maintain our rigid quality controls from raw materials to the final test on the finished products. These products, cast iron pipe and fittings, are being constantly produced and shipped to all parts of the country by our plants to meet the urgent needs for water, gas and sewerage service.

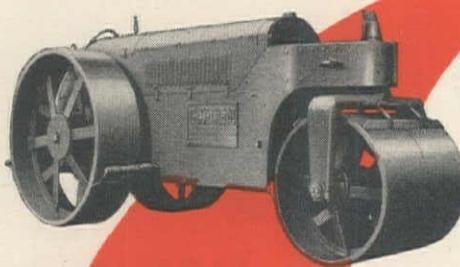


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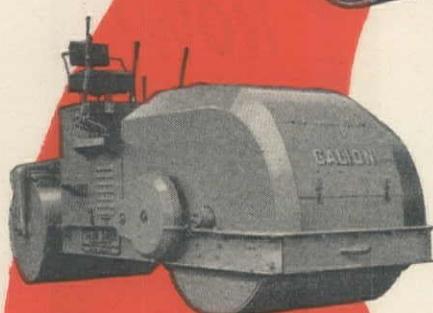
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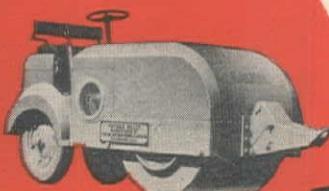
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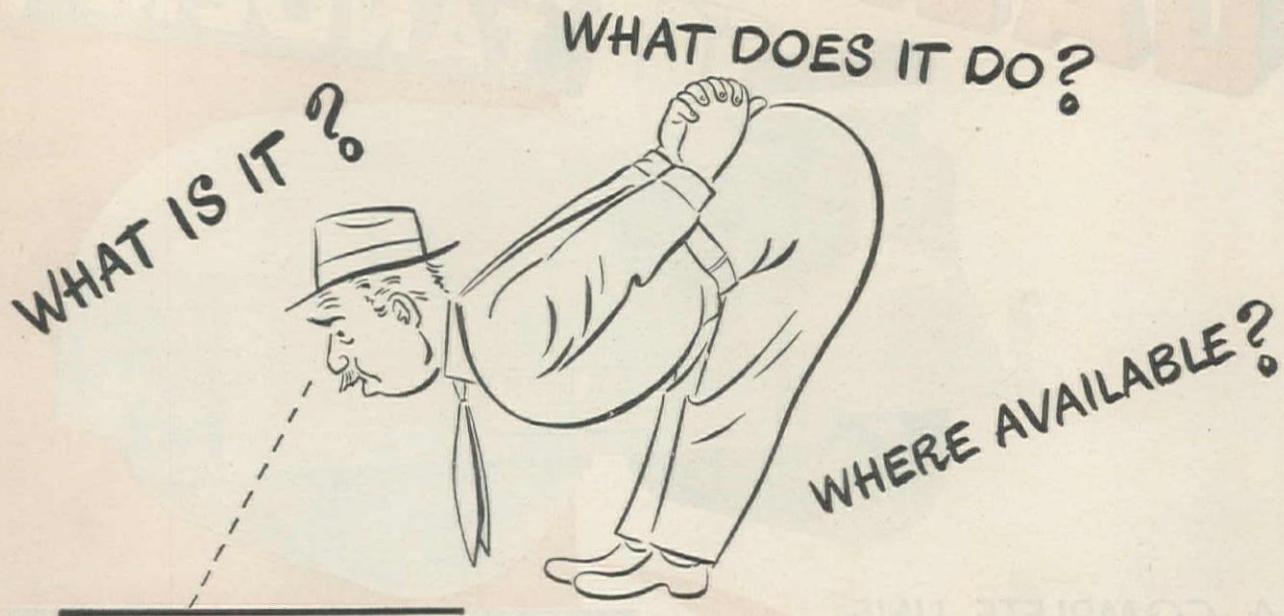
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Hydron is the modern, flexible type of concrete form-lining which case-hardens and beautifies concrete surfaces.

Concrete placed against Hydron loses water during and after vibration. Air voids, sand streaks are eliminated from the surfaces. This means a dense, hard, smoother concrete surface, with greater resistance to weathering and abrasion.

Mounted to forms with rapid-fire staple guns, these light, flexible Hydron sheets produce a case-hardening effect at least one inch deep, with a gradual change in the water-to-cement ratio from the surface into the bulk concrete.

Hydron has been used on many of the largest private and governmental construction jobs in the country, including giant dams and flood walls. Available only through U. S. Rubber Company branch offices.

Send for interesting copy of informative booklet on Hydron. United States Rubber Company, Mechanical Goods Division, 1230 Avenue of the Americas, New York 20.

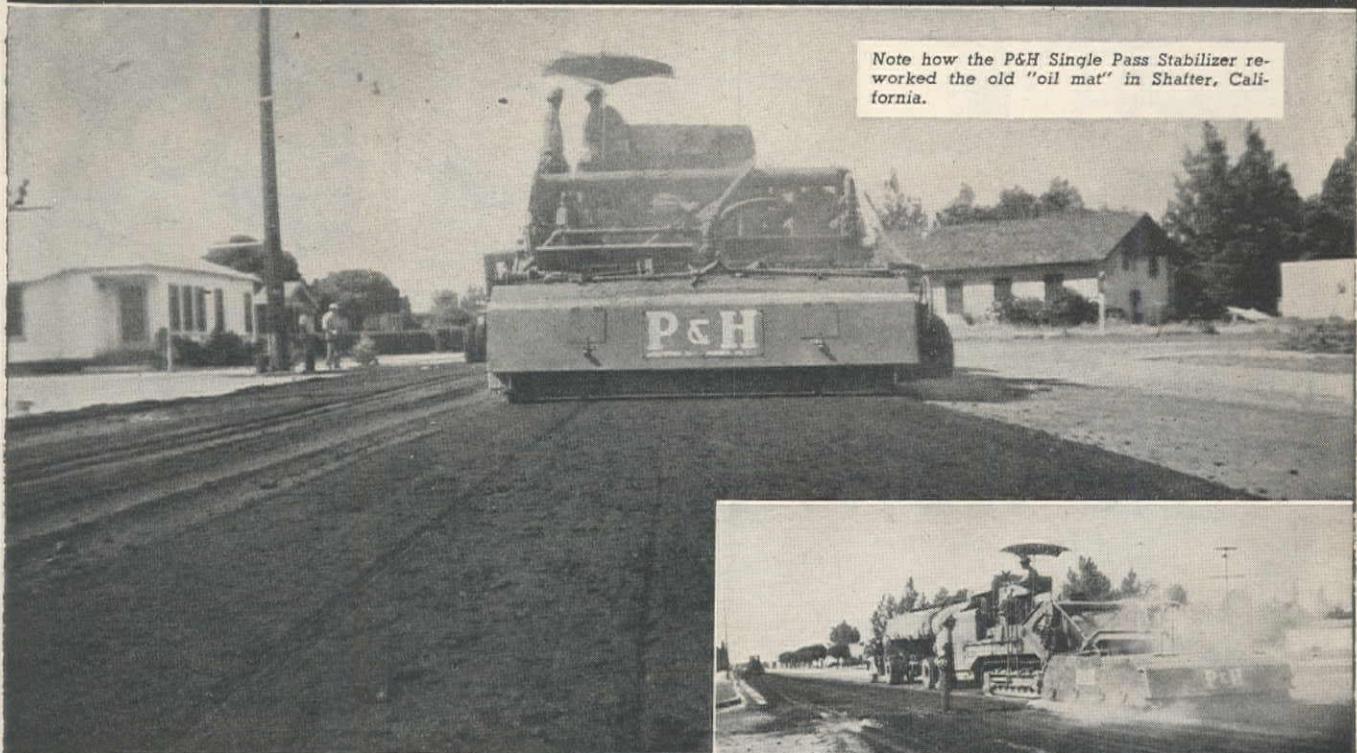


Note the smooth appearance of this concrete wall, cast against Hydron. There are no disfigurements, no surface imperfections. Both structural strength and surface abrasion-resistance are greatly increased by using Hydron.



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NEW METHOD OF REWORKING "OIL MAT"



Note how the P&H Single Pass Stabilizer re-worked the old "oil mat" in Shafter, California.



P & H STABILIZER DOES IT—IN A SINGLE PASS!

In Shafter, California, as well as in Delano and Tehachapi, the P & H Stabilizer is completely reprocessing old "oil mat" in a single pass.

In Shafter, the 5 to 10-year "oil mat" had been built up to an average depth of 3 inches but the P & H Stabilizer dug, pulverized and processed it at an average rate of 1000 square yards per hour.

The degree of pulverization was not only surprising but the P & H Single Pass Stabilizer can process to a depth of 6 inches when required. Travel speeds often exceeded 30 feet per minute.

The P & H Single Pass Stabilizer provides an entirely new and better method of reworking "oil mat" roads. For information on completed and active jobs—and on details of the machine, call the P & H Branch Office nearest you.

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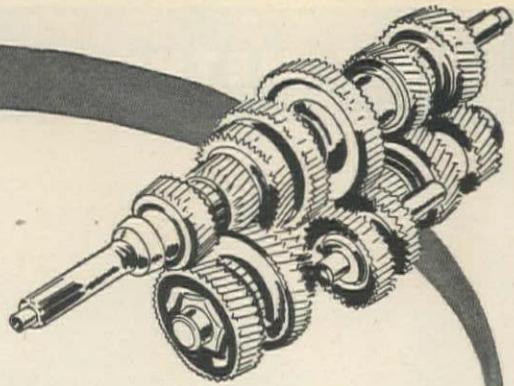
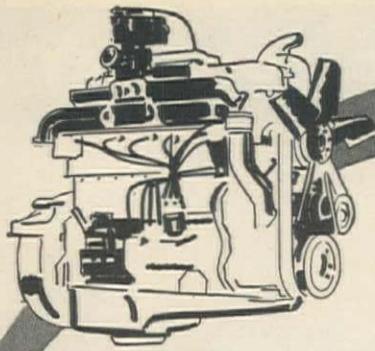
LOS ANGELES 11, Calif.



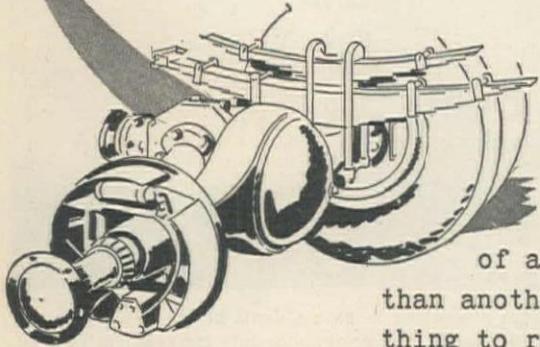
▲ Note the thorough pulverization of the old "oil mat"—the accurate application of asphalt and complete mixing. Traffic does not have to be re-routed with this new method.

▼ Completed street after shaping and rolling. The only equipment used was the P&H Stabilizer, tank truck, roller and grader.



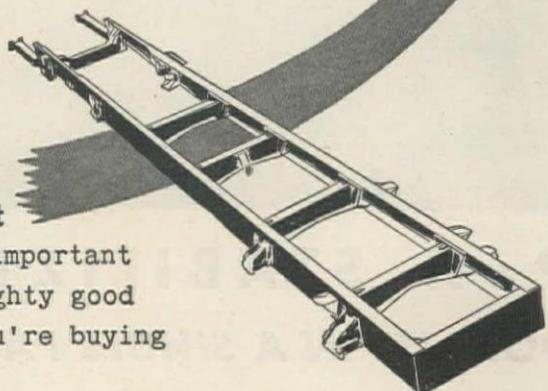


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No single part

of a truck is more important than another. That's a mighty good thing to remember when you're buying a truck.



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That's why here at Mack we maintain full control, through outright manufacture, over the materials, workmanship and testing of every part that goes into a Mack.

Mack

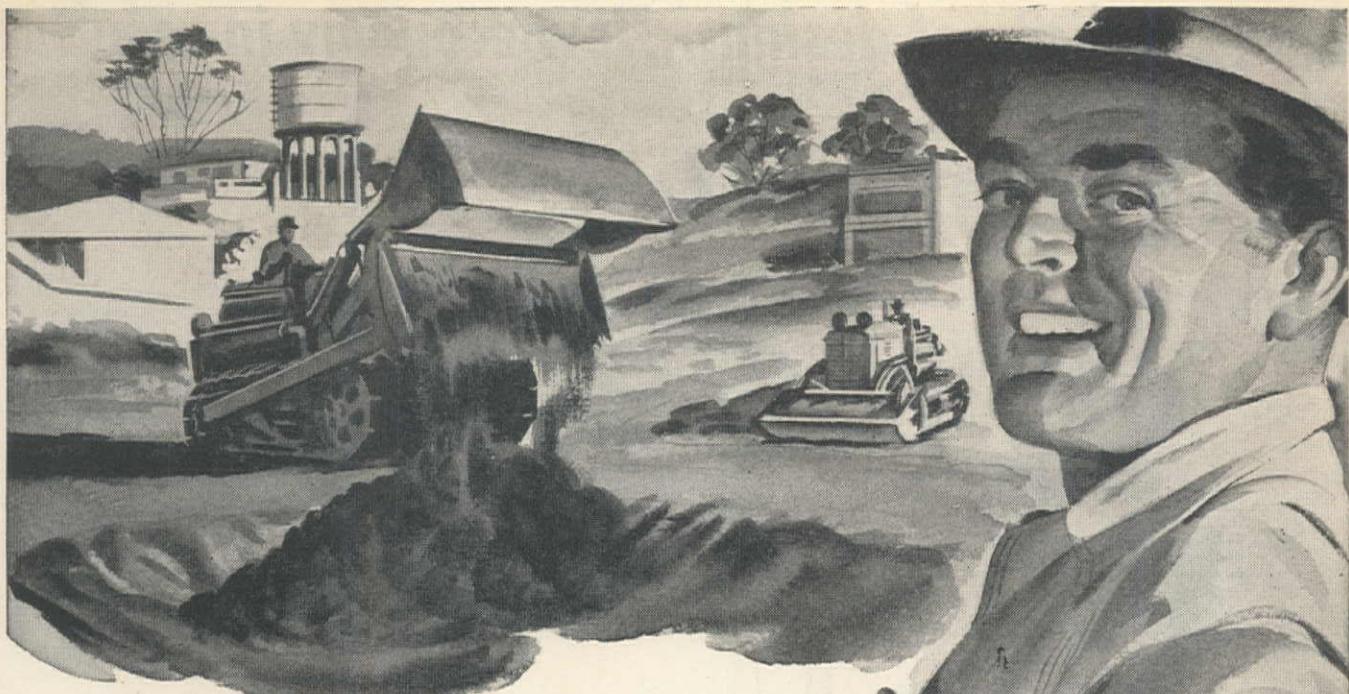
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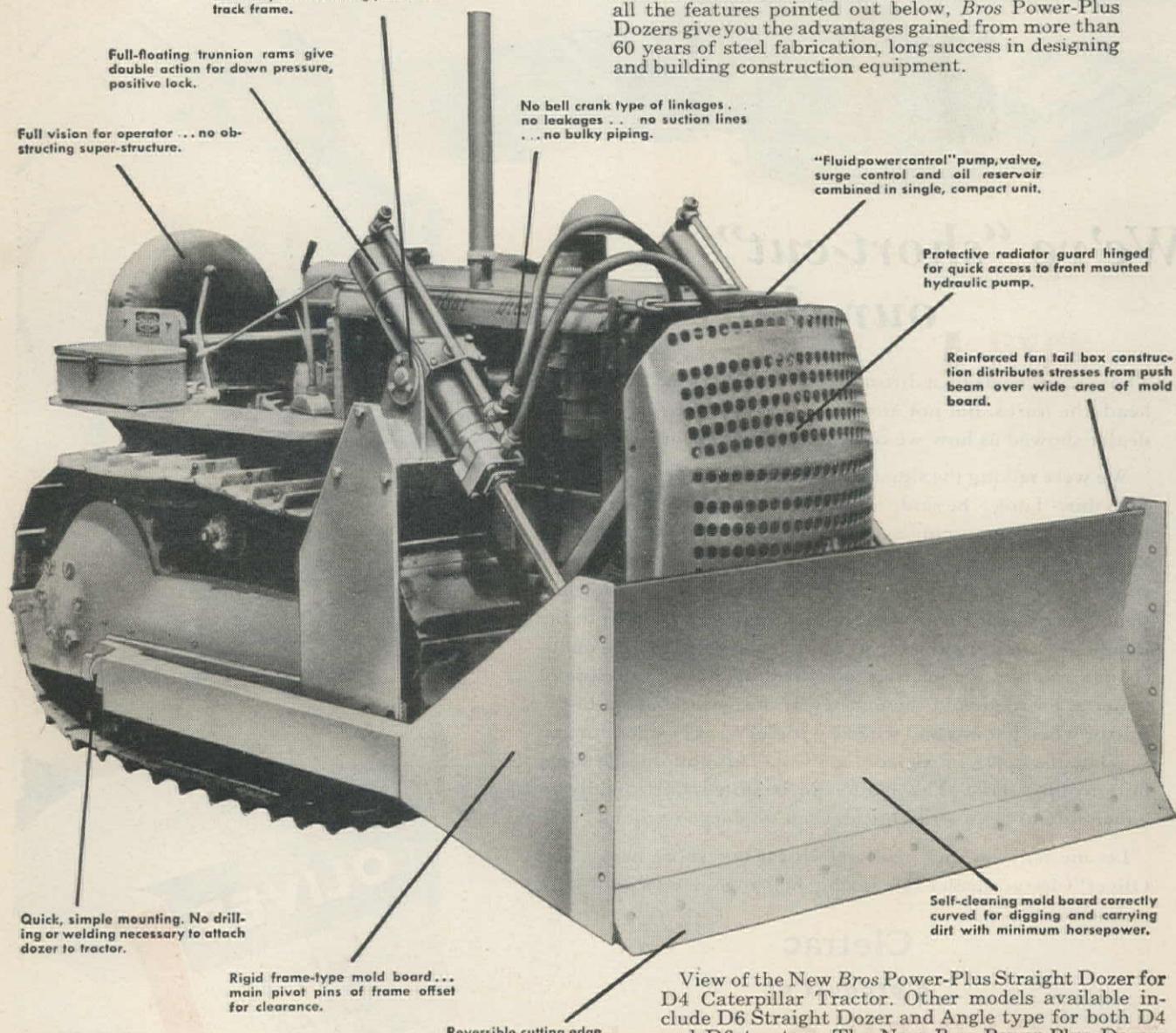
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Rigid frame-type mold board... main pivot pins of frame offset for clearance.

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Less
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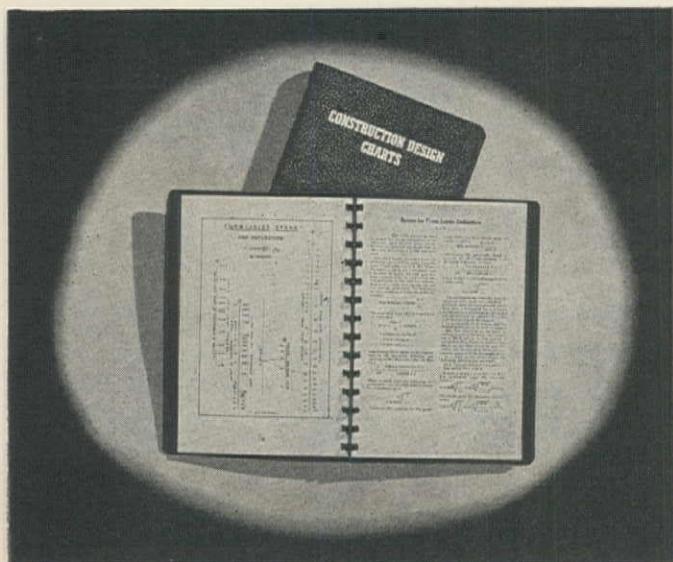


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4. Today UNOBA is performing hundreds of different jobs in all branches of industry, on construction jobs, and on farms. Simplify your lubrication with this unique all-purpose grease that resists *both* heat and water.

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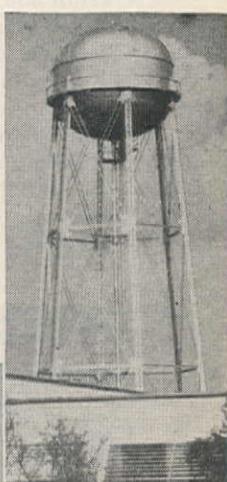
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Hemispherical bottom
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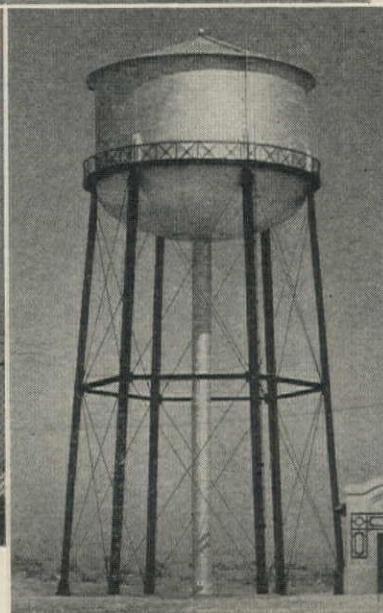
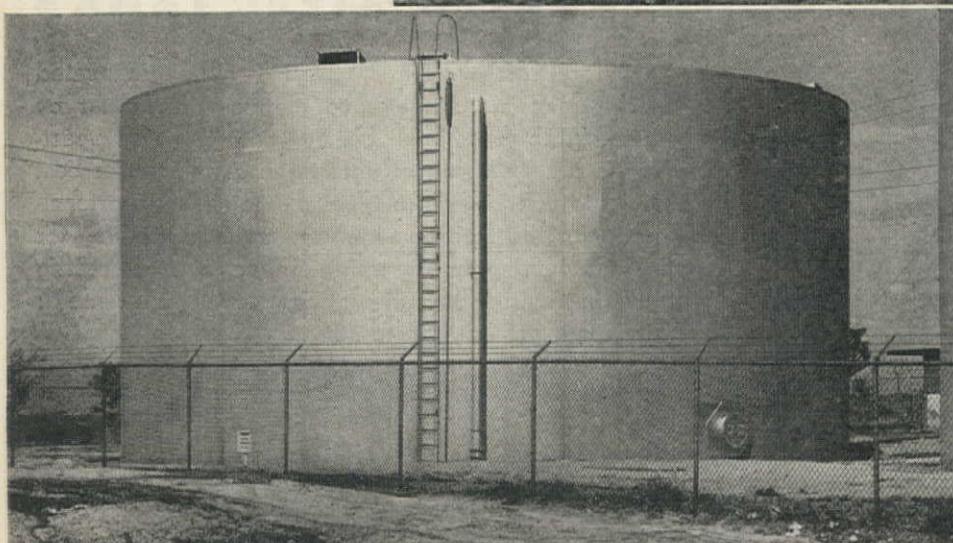
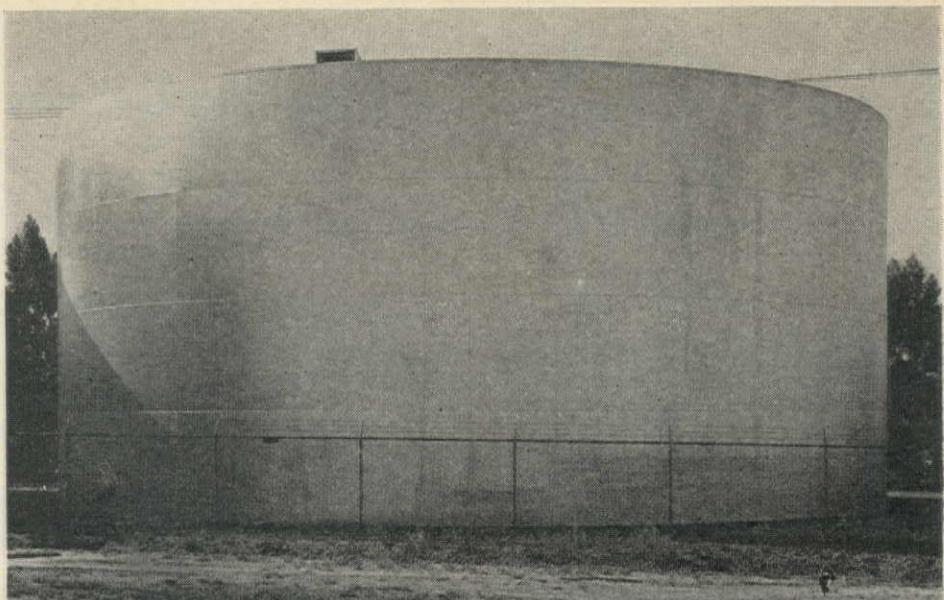


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Upper Right: 1,000,000-gal. Horton steel reservoir. Above: 500,000-gal. Horton steel reservoir. Right: 150,000-gal. Horton elevated tank.

BAKERSFIELD is located in the center of an oil producing and agricultural district in the San Joaquin Valley. Fifty-seven wells located at 53 different pumping stations supply the water distribution system which is operated by the California Water Service Company.

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age for one of the two high zones consists of three elevated tanks of 100,000-gal., 250,000-gal. and 500,000-gal. capacity. Water storage for the fifth zone consists of a 100,000-gal. tank.

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WESTERN CONSTRUCTION NEWS

October, 1947

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Vol. 22, No. 10

J. M. SERVER, JR. Editor
D. F. STEVENS Associate Editor
ARNOLD KRUCKMAN Associate Editor

Reclamation "New Deal" Condemned

STATE ENGINEERS of the seventeen Western states are to be congratulated upon their frank statement of conditions within the Bureau of Reclamation. The statement, in the form of a resolution adopted at the annual meeting of the Association of Western State Engineers last month, was not particularly remarkable in the conditions which it disclosed, or even in the remedy which it seeks; both have been discussed at great length in innumerable private conversations throughout the West, and occasionally in public.

It is, nevertheless, the first time that a formal body has gone on public record as being opposed, not only to the administrators personally, but to the administrative policies as well of the Bureau of Reclamation. The latter, of course, are derived directly from the former, a point which the state engineers did not hesitate to point out and connect with the very apparent loss of confidence in the Bureau of Reclamation by the Congress.

While it is to be regretted that the state engineers were unable to approve unanimously the resolution criticizing the administration of the Bureau of Reclamation, the opposition was minor in number and, in at least two of the three negative votes, quite understandable from a strictly political standpoint. The strong recommendation of the state engineers, "that the direction and control of the Bureau of Reclamation be returned to those experienced and qualified for such work in order that the standing of this organization may not further deteriorate," is worthy of the full support of all the West. We can only hope that the National Reclamation Association at its annual meeting this month in Phoenix will see fit to add its stronger voice to the recommendation of the state engineers.

The Registrar, Too!

IN THE AUGUST, 1946, issue of *Western Construction News*, an editorial was published pointing out the fallacy of employing any "broken-down cop" as an investigator for the California Contractors' License Board, or other licensed professional group. Prior to that time, only "experience in investigation" was required. After the editorial appeared, Daily Pacific Builder of San Francisco took up the fight, and through the combined pressure, the situation was remedied. Only a few days ago, a new civil service examination was announced for the position, requiring the applicant to be a graduate in engineering or architecture and to have experience in the construction industry. We feel a little proud of our work!

It occurs to us, however, that there is still one hole in the structure of the State License Board, namely the position of Registrar, the operating executive of the organization. This \$8,000 post, of vital importance to the integrity and operating efficiency of the whole scheme, is now a political plum to be handed to the political supporter most deserving.

No personalities are involved here, and this editorial is not aimed at the present incumbent; in the past, however, some appointments have been good and qualified, others have been completely inappropriate. The effectiveness of the Board, set up as a guardian of the people in their selection of a contractor to do their construction work, can be completely nullified through the inaptitude of the executive head, and

we respectfully suggest to the Governor and Legislature, that at this time when there is a great demand for qualified contractors, and when this heavy demand opens the door to the chiseler and the man who uses "sharp practices" only the strongest and soldest control of the operations of the License Board, a control untinged by political obligations, is essential. We urge that the executive position of Registrar, as are all the subordinate offices, be filled by the qualification of candidates through a civil service examination.

Reber Plan is Rolling

IN THE SEPTEMBER 27 issue of *Pacific Rural Press*, leading farm journal of the West, the following editorial was published, and we are happy to pass it on to readers of *Western Construction News*. It refers to the Reber Plan for complete development of San Francisco Bay by furnishing the best trans-bay crossing ever proposed, adequate water to meet the critical water shortage in the area surrounding the bay, military security, immensely expanded industrial, recreational and agricultural land, and rail connection for the presently isolated city of San Francisco. Readers of WCN know that this magazine published the first discussion of the Plan, and has been and is now a staunch believer in the value and in fact, the utter necessity of the plan. The editorial follows:

We are often asked why people around the Bay Area oppose the Reber Plan.

Very few do. The principal opponents seem to be: State officials who want to build another dramatic high bridge; a South Bay salt works; railroads which obviously do not want the expense of laying rails across the Bay; a small group of East Bay leaders who apparently do not want the rails to cross the Bay and probably don't want to quit dumping their filth into the Bay; and special interests who see no special "gravy" in the Reber Plan for them.

It obviously has vastly more friends than enemies. But friends have lacked selfish motives to give time and money to boosting it. There have not even been funds to print and circulate literature about the Plan unless somebody passed the hat and there has been almost none of that. What's everybody's business is nobody's business.

But this lack of coordination among friends is being remedied by a non-profit corporation to receive funds and conduct an educational campaign of circulating literature and mobilizing speakers to groups. This is a people's move and if you will help, you can send your contribution to the editor of the PRP and it will be used by this group in getting out the facts. A dollar will help and a larger check can help tremendously.

Shortly we will be able to publish a joint statement by a distinguished group of engineers and Army and Navy officials who agree that the Reber Plan is a magnificent and economical down-to-earth way of solving the acute water, transportation, and public safety problems.

This plan is a date with destiny—an opportunity to improve our future.

The Reber Plan is not one of those projects of eternal expense, but is one of vast values created in expansion and employment throughout the years.

The stakes are tremendous, and it is time that progress took over from pettiness.

With the wealth of engineering and construction possibilities involved in this great project, it occurs to the editors of *Western Construction News* that many of its readers, too, will be anxious to contribute to the fund to acquaint the general public with the project and mobilize opinion in favor of it, to the end that public funds will not be wasted on the limited facilities offered by new bridges, and checks sent to WCN for the purpose, will immediately be turned over to the above-mentioned non-profit corporation.

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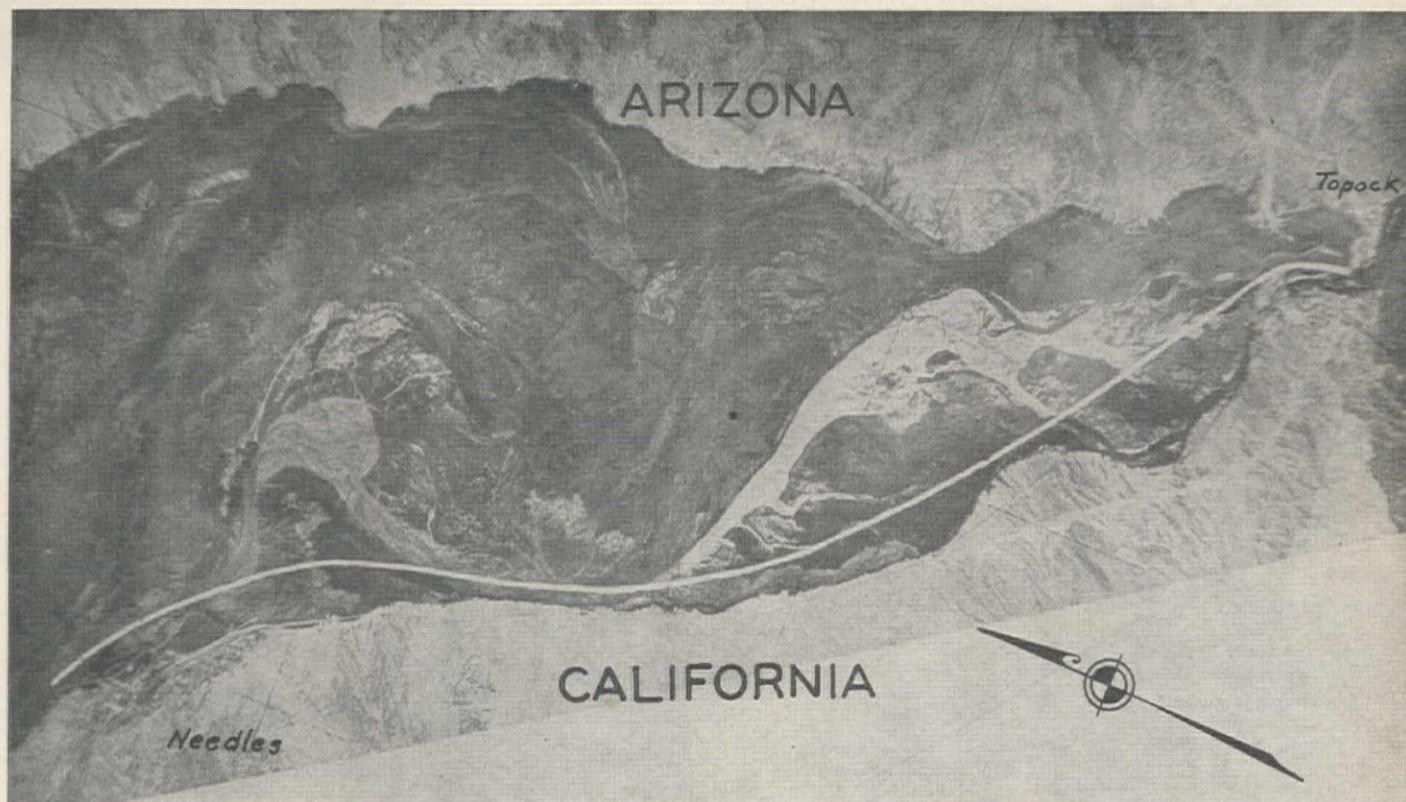
Salt Lake City 13

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OCTOBER • 1947



Colorado River— Silted Channel Dredging Is Planned

Rise of Colorado River threatens inundation of alluvial valley in Needles area — Channel clearance necessary to combat swamp growth—Amphibious vehicles used to solve surveying problems — Adverse conditions engender design of large size demountable dredge

THE COLORADO River rises in the Rocky Mountains of Colorado and Wyoming and, in its course of about 1,400 mi., flows through the high plateau region of Colorado, through spectacular canyons, and finally through broad alluvial desert valleys interspersed with rugged mountain chains, to the Gulf of California. Prior to the construction of any control works the Colorado was one of the greatest silt-bearing rivers of the world, transporting an average of 150 to 200 million tons annually, brought in from the drainage areas during periods of flood flow.

Prior to the construction of Hoover and Parker Dams, the flow of the river was unrestricted, and the flood waters

By R. W. DAVIS
Office of River Control
Bureau of Reclamation
Boulder City, Nev.

would annually inundate the broad alluvial valleys. The periods of high water were brief, however, and the duration of inundation seldom lasted more than one or two months.

At Needles, Calif., the river flows through an alluvial valley which is about 25 mi. long and from two to five miles wide. The city is located on the alluvial floor about midway in the valley. The lower or downstream end of the valley is near Topock at the headwaters of the

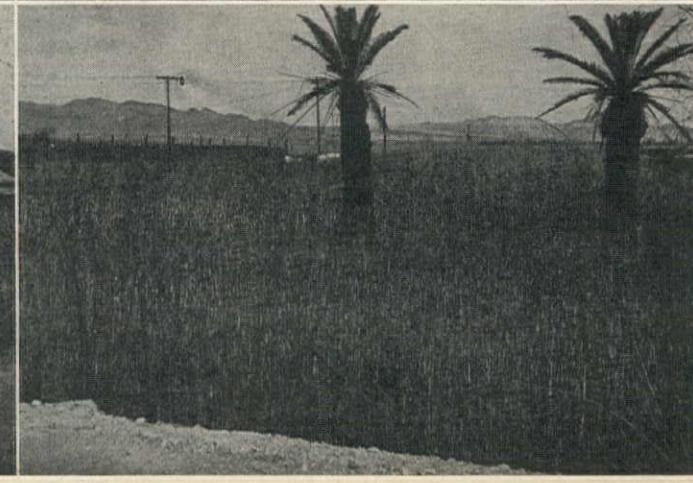
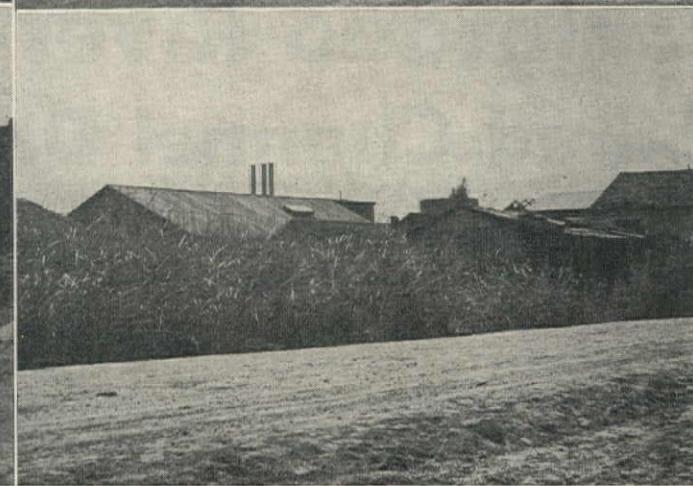
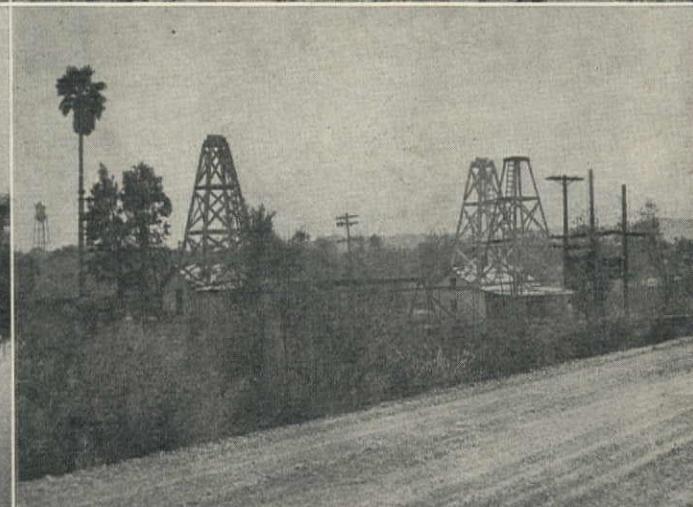
Havasu Lake, formed by Parker Dam. Needles is the division headquarters of the Atchison, Topeka and Santa Fe Railway Co. and, also is California's gateway for U. S. Highway 66.

History

In past years considerable meandering of the river has occurred through this valley, accompanied by general aggradation of the valley floor. Apparently only isolated water surface observations were made prior to the year 1931, but a study of the available records indicates that there has been a general rise in the water level, at least since 1902, for a given discharge of the river.

The accompanying chart represents the rise in water surface at Needles, reduced to the common discharge of 15,000 c.f.s., and covering the period 1901-1945. The time of closing Hoover Dam, Feb. 1, 1935, located about 90 mi. upstream from Needles, and Parker Dam, Oct. 16, 1938, located about 50 mi. downstream from Needles, are shown.

Between 1902 and the time that Hoover Dam was closed the water surface rose about 11 ft., or an average of 0.35 ft. per year. During this period the



river was completely wild and uncontrolled, as no man-made structure existed to influence the regimen of the water-way.

Beginning in 1935, concurrently with the closure of Hoover Dam, the rise was arrested and the water surface at Needles remained relatively constant. In 1940 the rise was resumed, as on other occasions in earlier years, but at a greater rate. By the end of 1944, the rise averaged close to $1\frac{1}{2}$ ft. per year, or about 4.3 times greater than the average rise prior to the closing of Hoover Dam.

Undoubtedly the closure of Hoover Dam had some effect on the time of the recent reversals or the magnitude of the changes, or both, but the amount of the effect cannot be determined.

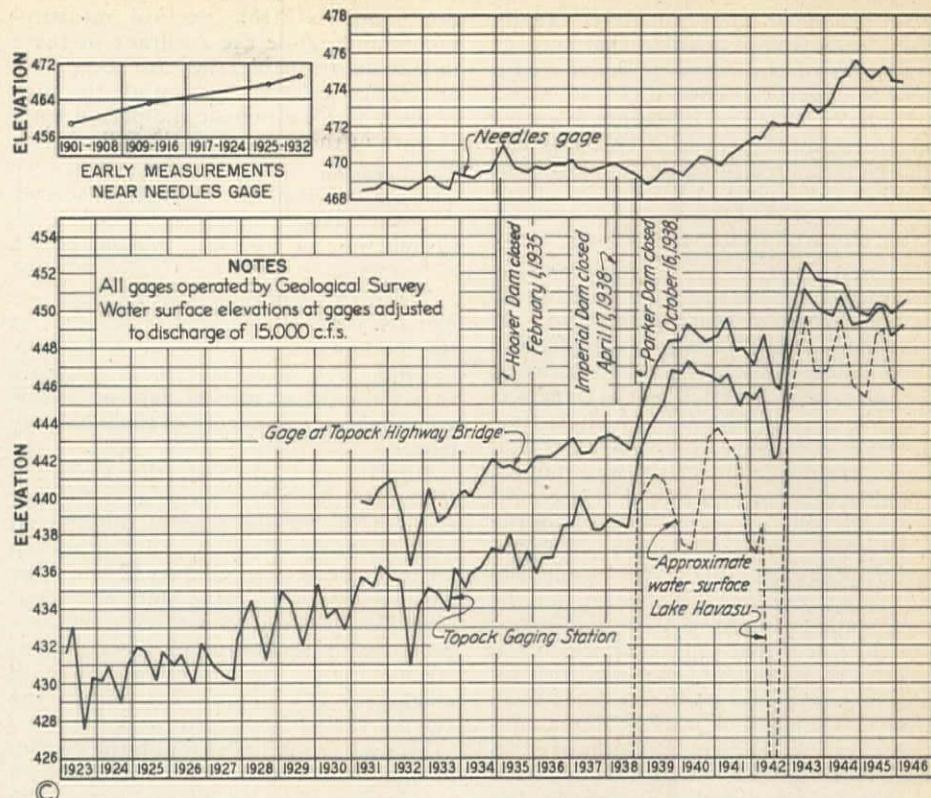
Potential threat

The effect of this rise of the river surface has been a serious threat to a portion of the city of Needles and extensive facilities of the Santa Fe Railway in this area since about 1911. In 1912 the railway company constructed a levee along the waterfront to protect its shops and yards. As the river surface continued to rise, conditions grew progressively worse and the rapid rise since 1940 caused widespread inundation of a large area shoreward of the levee, from backwater and seepage under the levee, to the extent that many homes had to be abandoned and unsatisfactory sanitary conditions developed. A substation of the California Pacific Utilities Company had to be moved to higher ground, the city's water supply system was threatened, and conditions were ripe for serious epidemics.

Early in 1944 it became apparent that the levee in front of Needles would soon be overtapped and, if this was permitted, inundation of a much larger area, including the station yard of the railroad, would follow. Simultaneously, the main line trackage of the railroad, for a distance of two to three miles downstream, came into the danger zone. During this year the railroad commenced to raise its tracks but because of the heavy transcontinental traffic during the war, and the many tracks involved, the task was of considerable magnitude and advanced but slowly.

The existing picture was clear. Not only was a part of the city of Needles transformed into a marshy swamp overgrown with tules, but a much larger area was seriously threatened and one of the largest and most important transcontinental railroads was in serious danger of being cut by the rising waters of the Colorado River. Under these conditions,

BEFORE AND AFTER scenes from Needles. Pictures at the left on the facing page were taken in December, 1943, those at the right in April, 1947. Top shows strengthening and enlargement of levee; next, city water wells; third, a light business district; bottom, a residence area. Whereas in the earlier pictures, the water has just recently risen to the destructive level shown, in the later pictures, the area has become useless swamp, overgrown with tules, and is completely unusable for any purpose.



GAGE READINGS showing elevation of the water surface of the Colorado River at Needles and at Topock, since readings have been kept. Water surface showed slow continual rise until closure of Hoover Dam, when it levelled off, but with closure of Parker Dam, and formation of Lake Havasu, rate of rising took an upward movement.

should it become necessary to release water at Hoover Dam much in excess of normal flow, to make room for the storage of flood waters in Lake Mead, it would be virtually impossible to prevent extensive damage to Needles and railway property.

The Bureau of Reclamation recognized the potential hazards at Needles and recalled one of its engineers, C. P. Vetter, from another assignment for the purpose of investigating the situation and developing remedial action. The Office of River Control was established under the direction of Mr. Vetter, who prepared a report in December, 1944, presenting an analysis of the events which led up to the critical river control situation and development of the remedial measures as later described.

Permanent corrective measures could not be initiated promptly by the Bureau of Reclamation because of the absence of Congressional authority sufficiently comprehensive to include major river control features. Emergency temporary measures, however, were promptly started and comprised raising the existing levee to provide a security freeboard and extending the levee at its raised elevation to high ground. Drainage pumps were installed to maintain a reduced elevation of the ponded seepage water.

Contributory causes

It is appropriate to discuss the causes which may have contributed to the described conditions, for a better understanding of the method selected to alleviate the potential catastrophic hazard.

One of the characteristics of a silt

bearing river is the fluctuation of the alluvial bed, with a general rise of the river bed during periods of low discharge, followed by a lowering of the bed during the passage of flood waters. Unlike most alluvial bed rivers, however, the alluvial valleys of the Colorado River are limited in extent, interrupted and separated by mountain chains and gorges, and with many washes discharging into the stream. The washes are typical of the arid southwest in that they are dry most of the time and often carry no water for several years in succession. However, when heavy precipitation occurs, the resulting runoff causes a brief flood of great intensity. These washes have unusually steep slopes and they discharge their drainage at velocities which will roll boulders. Consequently, at the mouths of the larger washes, coarse gravel and larger material are sometimes carried into the main stream forming partial barriers across its channel. Following the occurrence of such a discharge, there would be expected a general rise of the river bed upstream from the barrier until such time as a great flood, or series of floods, in the main stream removes the barrier.

During the period 1902 to 1932, it is entirely possible that one or more cloud-burst floods occurred in Sacramento Wash, which discharges into the river at Topock. It is known that the year 1932 had an unusually large runoff in the upper basin and that the river bed at the U.S.G.S. Topock gaging station, about two miles downstream from the Topock highway bridge, was lowered about five feet from scour. Had the years 1933 and

1934 produced approximately equally heavy runoff it is possible that the aggradation of the previous years would have been greatly reduced.

Actually, 1933 and 1934 were low runoff years and the scour of 1932 was virtually eliminated prior to the closing of Hoover Dam early in 1935.

After closure at Hoover

At first thought it would appear that the regulation of the river subsequent to the closing of Hoover Dam was responsible for the halting of aggradation during 1935 to 1941. With the closure of the dam the silt carried by the river was trapped in Lake Mead. For a short time the river was free of silt, flowing crystal clear, whereas it formerly was muddy.

The river soon corrected this condition. The silt free water, flowing on the same slope as the previous silt laden water, began to scour river bed deposits laid down in the earlier years. In the rock walled canyon sections the bed of the river scoured. The reactions of the river in recharging its contents with silt was in proportion to the releases from Hoover Dam, which were held to a minimum during the accumulation of storage. It is probable that the apparent stability of the riverbed in the Needles area during this period was because of the absence of silt rather than because of the regulated flow.

With the closure of Parker Dam in 1938, storage began to accumulate in Havasu Lake. In about one year the water surface at the Topock highway bridge rose about six feet but was drawn down by releases and did not again obtain this level until the beginning of 1943. The backwater influence was felt, however, and because of a great reduction of river velocity, dropping of suspended sediment became accelerated. Subsequent developments followed the pattern of river deltas, in that silt laden streams constantly extend and increase the elevations of their delta cones in the region where the streams enter the sea, with the rise extending back up the river.

Initially, small submerged sand bars which became enlarged and partially connected were developed, and as the elevations of these bars neared the water surface, tules and willows started to grow. This vegetation became extremely dense over these bars and as the bars spread, so did the vegetation until the area north of Topock was a wide swamp, almost impenetrable, with the river flow trickling through in a number of small channels.

Surveys of the situation

The picture may be sidelonged somewhat by a few figures relative to erosion and aggradation. With the closure of Hoover Dam, sites were selected in a 16-mi section below the dam to record river bed changes. By July, 1935, it became evident that changes were taking place so additional sites were fixed in the adjoining 13 mi. This process continued until a total of 43 river sections were established between Hoover Dam and Havasu Lake. The following data

are computed from section measurements and, while the accuracy of these data is questionable, they are acceptable as far as relative magnitude is concerned. The data cover the period from closure of the dam up to the fall of 1944.

Total erosion

below the dam	84,000,000 cu. yd.
Deposited above Topock	40,000,000 cu. yd.
Current rate of erosion	870,000 cu. yd.

per mo.

While the overall deposit of silt above Topock is approximately 48 per cent of the total quantity eroded below the dam, the more recent measurements indicate that the current rate of deposit in this area is about 75 per cent of the incoming load.

By the end of 1944, the Colorado River had ceased to exist as a flowing river in the swamp area of the alluvial valley between Needles and Topock, an airline distance of about 12 mi. The entire area, from bluff to bluff, was occupied by a swamp, dense with the tule growth and dead standing trees, impenetrable except by cutting a trail with machetes. The depth of water in the swamp varied from zero to 15 ft.

The water filtered through the swamp in many small channels, none of which was continuous. In places where the velocity became reduced, additional silt was deposited forming bars and obstructions and forcing the flow to some other location. Some narrow isolated flows appeared to have considerable velocity but apparently not enough to open a major channel. Water continued to enter the swamp from the still existing channel above Needles.

Survey methods

During the summer of 1945 it became apparent that continuation of conventional methods of measuring the river sections in the swamp was impracticable. The survey party had to wade in water, shoulder deep, and clear the tule growth before it could advance. Over much of the section line the depth of water necessitated swimming with continued clearing. A small boat was used over a part of the area, but the extensive dead trees, inundated fence posts, and the necessary clearing to obtain passage of a boat made progress very slow.

With the end of the war, the Bureau obtained some amphibious vehicles, officially known as the Mark III, Landing Vehicle Tracked. These vehicles are believed to be the first of their type used for peacetime operations. They were obtained for use in the swamp area, measuring the established sections, and for obtaining investigation data not heretofore obtainable by former survey methods. Coverage of the river bottom jungle proved a relatively simple task for the vehicles. Measurement of the river sections by use of the vehicles was completed in two weeks as compared to a period of more than 1½ months required by former survey methods employing a larger survey crew.

The amphibious vehicles have proven their worth in the river bottom jungle and will be used to obtain the survey data necessary to the control and prose-

cution of the corrective measures hereafter outlined. The vehicles are sufficiently stable on a submerged bar when footing is within reach of the treads or a mud bank so that a transit or level may be set up in the vehicle and obtain a line of sight over the tops of the tule growth without resort to clearing operations.

The project

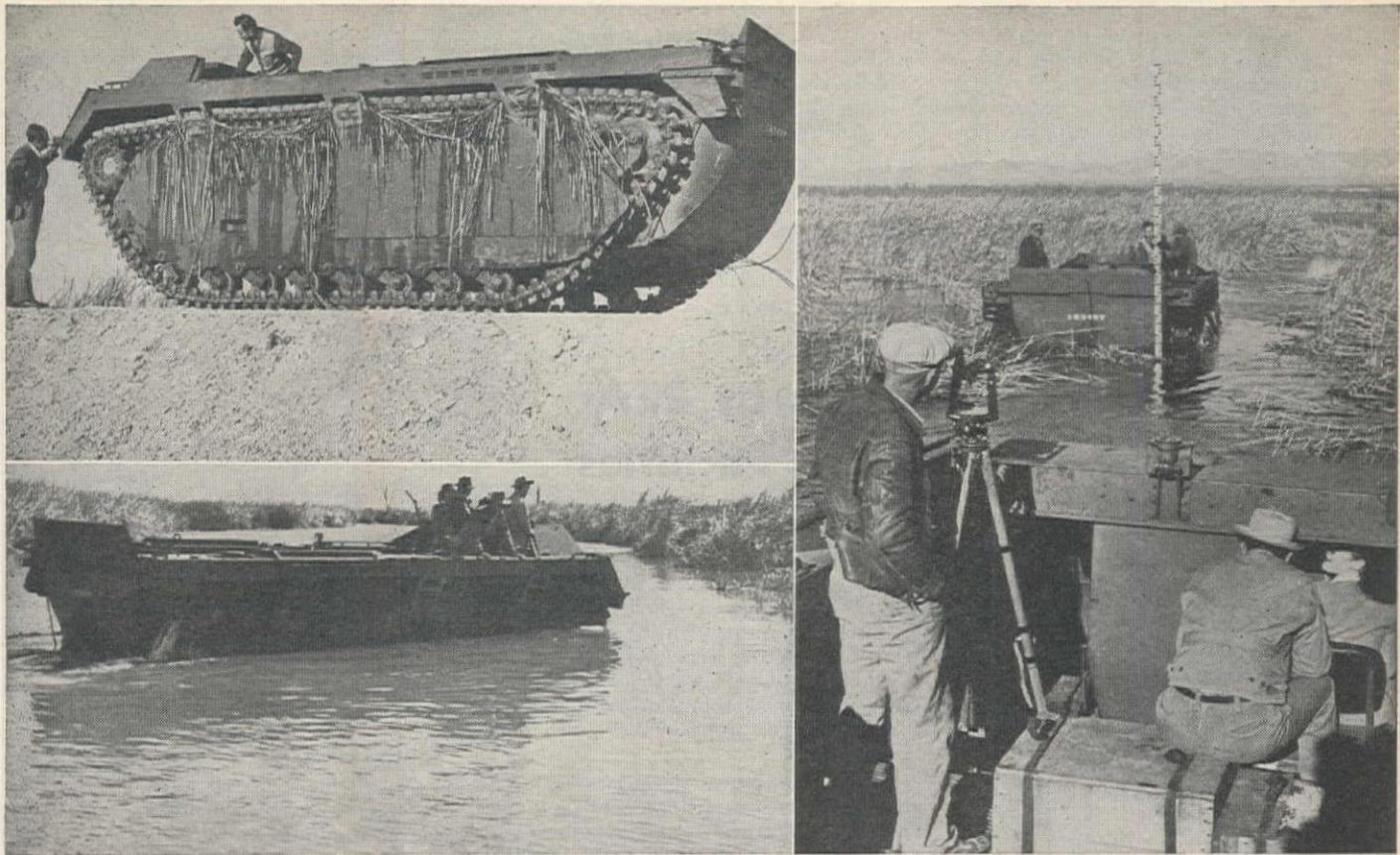
The problem resolves itself into opening of a channel of sufficient capacity to pass the routine day-to-day releases from Hoover Dam. One other consideration supplementary, but of primary importance, is the passage of increased releases from upstream reservoirs so as to provide storage space in these reservoirs to trap the extremely large tributary flood waters. At present but one dam, Hoover, is available to release water or to provide storage for flood inflow. Davis Dam, located about 28 mi. upstream from Needles, is now under construction and, when completed, will act to reregulate the river flow. Under that promise provision for a maximum river flow at Needles of 40,000 c.f.s. is believed conservative.

The slope of the water surface from Needles to Topock, under existing conditions and routine releases, is about two feet per airline mile, which encourages fairly swift flows in the few narrow channels. Under these conditions, however, widening of the narrow channels or an increase in their carrying capacity has been stubbornly resisted by the dense plant growth. Bearing in mind these conditions and the recorded events, it was apparent that the opening of a channel would be dependent upon a physical development, foreign to natural sources, but one to which the river may offer some assistance. Unquestionably, the only practicable manner of providing the required channel is by dredging.

In developing the plan of operations, first consideration was given to dredging a pilot channel, so located that the small natural channels would supplement the pilot channel. It was found, however, that reasonable location of an artificial channel would be but little benefited by the small existing chutes and, therefore, a pilot cut for the distance of 12 mi. would be impracticable. The plan later developed considered dredging a channel about 250 ft. wide to a depth of 17 ft. below water surface. Spoil from the dredge discharge will be shaped, insofar as is practicable, along the east bank of the excavated channel to form a levee.

Repetition anticipated

Immediate relief at Needles will follow completion of such a channel but it cannot be expected that the relief will be permanent, because the main forces responsible for the existing conditions will continue. Initially, the silt transported by the river will be carried past Topock, instead of being trapped in the Needles area, and deposited in the upper canyon section of Lake Havasu known as Topock Gorge. In a period of time this deposit will again cause a rise of



AMPHIBIOUS landing vehicles, bought as war surplus, are virtually the only satisfactory method of negotiating the shallow water and treacherous swamps formed by the tules and other varieties of brush growing in the undefined channel. They will negotiate either water or land areas, and can be held steady enough to read levels on the bottom, as shown at right.

the water surface at Topock and this rise will progress upstream in a manner very similar to that which caused the present situation. The low banks of the channel through the swamp will be overtapped, the water will again spread over contiguous territory, the backwater cycle will be in operation and, if permitted to continue, will reinstate the existing menace to Needles.

The length of time which will elapse to reproduce conditions at Needles as of Nov., 1944, cannot be accurately predicted, but because of progressively reduced river slopes, it is reasonable to anticipate a period at least as long as the original production period, 1938 to 1944.

With Davis Dam, now under construction, in operation, all silt originating upstream therefrom will be trapped in the lake formed by the dam and only clear water will be released. The length of waterway below Davis Dam available for erosion above Needles will be about 28 mi. and experience gained from retrogression data indicates that this distance is insufficient for the river to recharge itself with a full load of silt.

In other words, if Davis Dam is placed in an operating status in advance of culmination of the repeat cycle above described, it may be that the second phase of maintaining free channel flow will be obviated or greatly reduced.

The complete plan, however, includes the contingency that commencement of the operation period of Davis Dam will be too late to exert sufficient influence on the river regimen, and that the second phase of the program will be required, which will consist of dredging

a second channel located adjacent to and on the California side of the original dredged channel. This location is selected with the view of enlarging the sand ridge formed during the first phase.

The purpose of the levee is twofold. First, it will prevent loss of water from the channel during the period while the river bed is rising, and secondly, it will offer protection for the large area east of the channel, leading to a possible future reclamation of this fertile valley.

With the completion of the work above described, it is probable that the ultimate river slope from Davis Dam to Topock will approach about $1\frac{1}{4}$ ft. per mi. Bearing in mind that the valley is alluvial and that the river may be relatively free from silt, further adjustment of the slope by the formation of bends may occur. The predominant plant growth in the valley, however, will in this case operate in favor of the engineer.

Equipment

The Colorado River is classed as a navigable stream. It lacks, however, any artificial control and alignment structures, other than dams, and mobilization of a dredging plant is limited to land transportation facilities to the river site where a dredge may be constructed.

The material to be dredged consists, not only of the sediment transported by the river and laid down through the years, but also of tree roots, stumps, and tules. Clearing of the area to be dredged will, in the majority, be impracticable as the clearing would have to be accomplished from floating equipment. Experts in the field of dredge operations have universally recommended a dredge having a 20-in. discharge line. While a smaller size line would discharge the material, unquestionably the discharge line would frequently become clogged with tules which would delay operations and increase the cost.

Once a dredge was constructed and ready for operations at this site, its usefulness would be limited to this section of waterway unless the dredge was so constructed that it could be taken apart and moved to other work sites and there reassembled for further usefulness. This requirement called for a sectional pontoon type hull and machinery which could be moved by rail or highway trailer.

An order for the dredge and dredging equipment has been given the Pacific Coast Engineering Co., Alameda, Calif., on its low bid of \$871,700, submitted last May. The contract calls for the furnishing and assembling of one suction dredge complete with fuel barge, work barge, pipe barge, and power attendant plant.

The contract specifies that the dredging equipment be constructed and assembled at Needles. The equipment will be designed by the contractor within the limitations set forth by the Bureau so that it will be capable of accomplishing

the work as outlined in the specifications. The dredge will be about 40 ft. wide and from 120 to 140 ft. long, with a draft of not more than 6 ft.

To the best belief of the writer no demountable dredge of equal capacity has been previously used on any inland waterway. The dredging problem in itself is not strange, but the problem of design of a sectional pontoon hull, and selection of equipment for that hull, offers many problems to the dredge designer.

The river control project is under the direction of the Bureau of Reclamation headed by Commissioner Michael W. Straus, Washington, D. C.; Walker R. Young, M. ASCE, is chief engineer with headquarters in Denver; and E. A. Moritz, M. ASCE, is regional director of Region 3 in which the project is situated. C. P. Vetter, M. ASCE, is chief of the Regional Office of River Control which is in immediate charge of the work at Needles and at other points on the lower Colorado River.

rural consumers of which 203 mi. serving 312 rural consumers have already been built with funds from previous loans.

Roosevelt Rural Public Power District, Mitchell, received \$61,000 for completion of previously approved construction and for 37 mi. of line to serve 80 rural consumers.

New Mexico

Socorro Electric Cooperative, Socorro, received \$48,000 from the REA for installation of a 460 kw. generating unit.

North Dakota

Slope Electric Cooperative, New England, was given \$250,000 by the REA to complete previously approved construction and for 120 mi. of line to serve 136 rural consumers.

Oregon

Coos Electric Cooperative, Coquille, Ore., was loaned \$450,000 for the acquisition and rehabilitation of 47 mi. of line serving 342 consumers and two generating plants, for a new 300 kw. generating unit and for 38 mi. of new line to serve 128 rural consumers.

South Dakota

West River Electric Association, Wall, S. D., received an REA loan of \$125,000 for completion of previously approved construction and for 58 mi. of line to serve 52 rural consumers.

Texas

Bailey County Electric Cooperative Association, Muleshoe, was granted an REA loan of \$350,000 for system improvements and for 106 mi. of line to serve 209 rural consumers. Bartlett Electric Cooperative, Bartlett, received \$160,000 for 131 mi. of line to serve 242 rural consumers.

Washington

Mason County Public Utility District No. 1, Shelton, received an REA loan of \$42,000 for system improvements, for completion of previously approved construction, and for 13 mi. of line to serve 31 rural consumers. Public Utility District No. 1 of Chehalis was loaned \$250,000 for system improvements and for 153 mi. of line to serve 334 rural consumers.

Utah Water Board Approves First Reclamation Projects

THE UTAH Water & Power board, a creation of the last Utah legislature, has approved two small reclamation projects. One, involving the construction of a one-mile tunnel near Blanding, will be financed by a \$75,000 state loan repayable over a period of 25 years. The other, a dam in Garfield county, will be financed by a \$32,000 state loan repayable over a period of 15 years.

The state board was set up to supplement the work of the U. S. Bureau of Reclamation by financing supplemental water projects too small for Reclamation Bureau attention. As a starter it was given a revolving fund of \$1,000,000 by the Legislature. William R. Wallace is chairman of the board.

Loans to Western Districts by REA Assure Many New Electric Facilities

RURAL ELECTRIFICATION Administration loans throughout the United States in the past month included several to districts within the western states. The funds, distributed mainly to rural electric cooperatives, will be used to finance completed construction with prior REA approval, system improvements, and new transmission and distribution lines. Construction on the new distribution lines will start as soon as materials can be secured by the borrowers.

Communities in the West receiving recent loans include:

Montana

Big Horn County Electric Cooperative, Lodge Grass, received a loan of \$160,000 for purchase of office facilities

and for 90 mi. of line to serve 112 rural consumers.

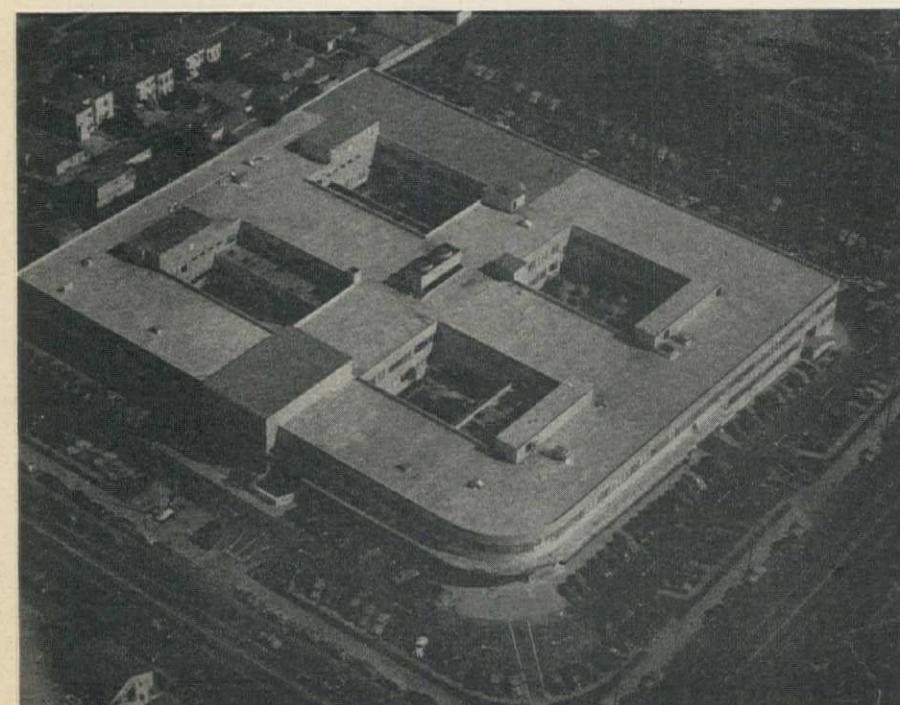
Nebraska

Dawson County Public Power District, Lexington, received \$627,000 for completion of previously approved construction, for system improvements and for 311 mi. of line to serve 888 rural consumers.

Panhandle Rural Electric Membership Association, Alliance, was loaned \$646,000 (together with a previous loan of \$300,000) for acquisition and rehabilitation of 4 mi. of line and a generating plant serving 144 consumers in the village of Hyannis, Neb., purchase and installation of additional generating units, 58 mi. of transmission lines and for 383 mi. of distribution lines to serve 592

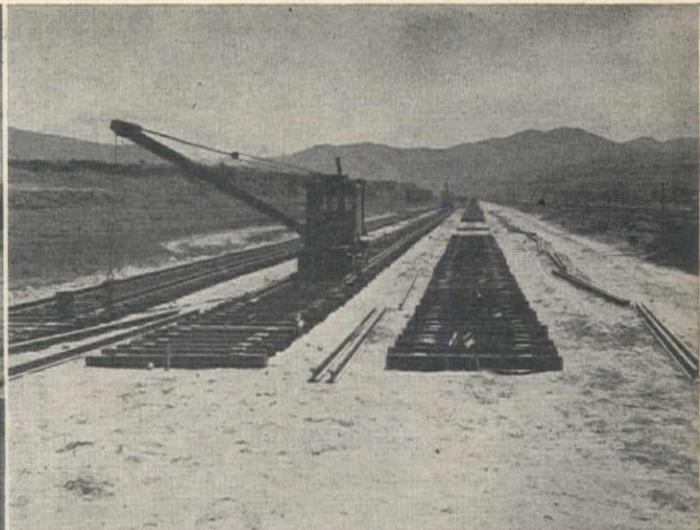
NATIONAL HEADQUARTERS BUILDING FOR DRUG COMPANY COMPLETED

HEADQUARTERS building for Rexall Drug Co., recently completed at Beverly and La Cienega Blvds., Los Angeles, by Louis C. Dunn Co., contractors of that city, at a contract cost of approximately \$3,000,000, covers an area of 325 x 400 ft., is supported on 1,150 tapered piling, is of the most modern design and construction throughout and is surrounded by parking areas to handle 300 cars. H. C. Brunner, of San Francisco was the structural engineer in charge of designing this large structure.





IN CONSTRUCTING the new railroad yard facilities for the Union Pacific Railroad at Pocatello, Idaho, a considerable portion of the Ross Park Municipal Golf Course was covered with earth. At the left, the last golfer



to use the course is shown making his final putt. The course will be relocated. At the right is shown a Union Pacific track crane lifting a rail into place. All track work was done by force account by the road.

Pocatello Railroad Yard Expansion

ONE OF THE LARGEST and most modern railroad yards in the West is now under construction at Pocatello, Idaho. When completed in November it will facilitate the handling of over 10,000 freight cars a day in that railroad town, and will be one of the largest switchyards owned by the Union Pacific Railroad Company.

Commonly known as the "gravity hump system," it will enable operators in the central switch control tower to make up freight trains by the manipulation of buttons on their switchboards.

The project was designed by W. C. Perkins of Omaha, Nebr., Union Pacific Railroad Chief Civil Engineer. L. V. Chausse, Pocatello, Chief Division Civil Engineer, is supervisor of construction. Cost of the project will be over \$2,000,000.

Earthfill contract

A contract to place an earthfill of 600,000 cu. yd. was awarded in March to Barnhart and Wheeler Company of Pocatello for \$300,000. Nelson and Pickett Construction Co. of St. Anthony, Ida., is sub-contracting a portion of the work for Barnhart and Wheeler.

This earthfill will vary in length from 1,132 ft. to 1,218 ft., and is being built wide enough to accommodate 46 tracks. At the north end is the hump hill that will be 16 ft. high. Cars will be pushed to the top of this hill and released. They will coast down towards the south end of the yards and be diverted onto any one of the 46 tracks at the direction of the control tower. As trains are made up

Two million dollar expansion program by Union Pacific at Idaho railroad center will permit handling of 10,000 cars daily with quick dispatch from central electrically-operated control tower—Forty-six make-up tracks will be available

By HOWARD TIPPETTS
Idaho Falls, Idaho

on these tracks, engines will be attached, and they will be ready for departure in less than half the time previously necessary.

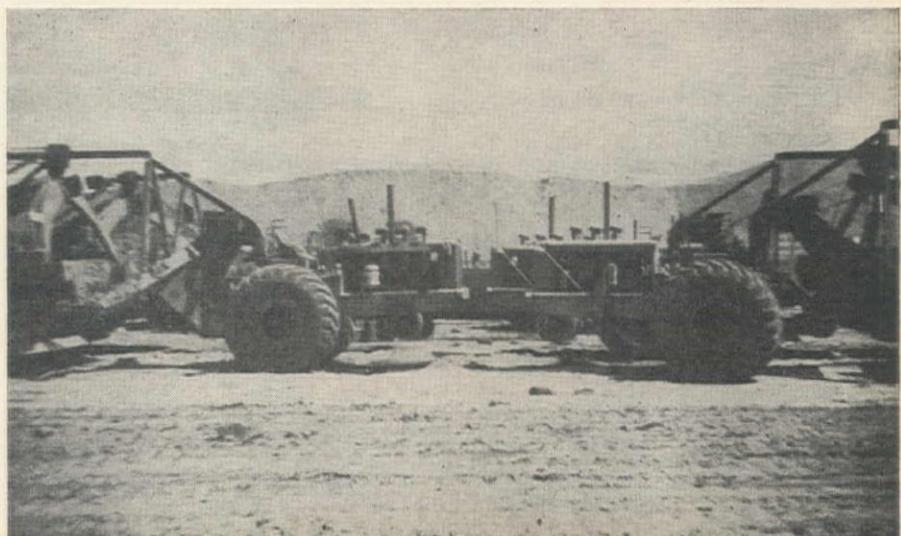
Twenty trucks, four 15-cu. yd. Tour-

napulls, two 10-cu. yd. scrapers, shovels, draglines, and several crawler tractors are being used by the contractors to move an entire mountain of earth from the foothills to the west of Pocatello onto the yards, a distance of about two miles. This heavy equipment was also put to use in re-channeling the Portneuf River for a distance of several hundred feet. All track removal, connections and laying are being carried out by the railroad's own forces.

Several months of negotiations with the city and one condemnation suit were necessary before work could be started. The yard extends through the Ross Park Municipal Golf Course, which will be relocated as soon as a suitable site is found.

Principal installations

Features of the new yard will be three



HEAVY EQUIPMENT used by Barnhart & Wheeler, contractors on the earthmoving for the yard expansion, drawn up for inspection and lubrication between shifts. Nearly 600,000 cu. yd. of earthfill was required at the site.

brick retarder control towers 30 ft. high, a retarder master's office, yard office and locker room, storehouse, compressor house for pneumatically operated switches, a locker building with showers, lockers and eating room, another locker unit for switchmen and trainmen, and a radio communication system between the yard locomotives and control towers.

Installations involve placing 4,000 ft. of 4-in. fire line for protection, as well as air, steam, water, and electric conduit lines. The entire yard will be served by a 6-ft. drainage pipe. Public address speakers set throughout the yard will keep control tower personnel in contact with yardmen, and a pneumatic tube will be installed from the present Union Pacific depot and freight house to the new yard for written message conveyance. Primarily for freight train switching,

the new yard means changes in trackage of present yards for passenger train switches. Over 35 mi. of track will be installed in the new extension.

Specifications call for a rip track unit for repairs as part of the new yards, the unit to include concrete drain boxes. An inspector's pit featuring lights shining underneath as well as above the cars will allow minute examination of cars as they pass through the yard so they may be shunted, if necessary, to repair round-houses.

One of the last buildings to be constructed will be a complete round-house at the south end of the yard. This will result in much greater efficiency, since under the old layout, it often took more than two hours for an engine to get from the round-house near the north end of the yard to the point of departure at the south yard limits.

Seattle and Tacoma Negotiate Firm Power Transfer Agreement With BPA

THE MUNICIPALLY owned power systems of Tacoma and Seattle are now receiving firm power from the Columbia River system of the Bonneville Power Administration, supplementing supplies from the two cities' own generating plants.

In announcing the start of deliveries—40,000 kw. to the City of Tacoma and 15,000 kw. to the City of Seattle—E. R. Hoffman, Superintendent of Seattle City Light, J. F. Ward, Superintendent of Tacoma City Light, and Bonneville Power Administrator Paul J. Raver said the power was being delivered to the

cities under terms of newly-executed contracts.

The new agreements with the two cities will replace interchange contracts executed in 1940 and will provide, in addition to the delivery of firm power, for a continuation of the exchange of energy and for the transfer of power from the government's Columbia River system to Bonneville Power Administration customers in the Puget Sound area.

The arrangements, the three officials said, will further implement the effectiveness of the coordination and utilization of power resources of the public

power systems of the region by providing for the mutual use of storage space in the reservoirs of the three parties to the contracts, when available, for any energy which would otherwise be wasted. Such an arrangement will permit a maximum use of all water in the power streams of the two city plants and the Columbia River and be of mutual benefit to all of the parties involved. The new contracts provide the basis for complete pooling of resources of the Seattle, Tacoma, and BPA systems, the combined generation of which represents 60 per cent of the total for the region.

The contracts will remain in force ten years, with provisions that the purchasers may increase contract demand if required or may reduce the demand if and when the two city systems add sufficient new generation to their own plants to handle their own requirements. The contracts in all respects recognize the existing arrangements between the two cities for the integrated operation of the Tacoma and Seattle municipal resources.

At the time the first interchange agreements were executed with the Tacoma and Seattle City Light Departments the two municipal systems had sufficient generation to meet their normal requirements. However, during and after the war population increases and industrial growth in their areas have increased power requirements to a point where they are now in advance of their generation installation schedules on the Skagit and Cowlitz Rivers.

Colorado Rejects Lone Bid on Loveland Tunnel

THE ENTIRE Loveland Tunnel project involving the spectacular pass tunnel through the continental divide on U. S. Highway 6 will be postponed and may be abandoned after only one bid was received on the undertaking at bid opening time. This viewpoint was expressed by Colorado State Highway Engineer Mark U. Watrous after conference with department engineers. The lone bid was submitted by the Western Contracting Corporation of Sioux City, Ia., and was for boring of approximately 2,000 ft. of the mile-long tunnel. The highway department had placed an estimate for the first unit at \$1,385,000 with the entire cost calculated at about four and one-half million dollars.

Watrous said he had not decided whether to readvertise the contract at the present time since work could not begin before the end of winter and the first deliveries of steel could not be made before next spring, and indicated that any future contract may be for the construction of the entire tunnel. He further stated that if no definite policy had been decided upon by spring it would be necessary to go ahead and rebuild and oil the present inadequate road over Loveland Pass. State engineers discounted the rumor that state forces might construct the tunnel.

WATER DISTRICT WORKS RIVER SAND TO INCREASE PERCOLATION

ORANGE COUNTY Water District of California regularly works over the sand of the Santa Ana River during dry weather to increase percolation in the rainy season. The International crawler tractor shown below is used to reduce vegetation and thus transpiration, to ridge the sand so as to divert flood waters over the entire surface of the river bed, to loosen topsoil and open sealed pores, and to level channelized areas. The District has stabilizing dams at 1,000-ft. intervals, to prevent channel cutting.



Tacoma Extends Nine Outfalls

Sewer outfalls into Puget Sound extended with funds provided in 1944 bond election — Concrete pipe sections laid in underwater trenches, backfilled to prevent later rupture of lines — All placement operations on the pipe sections is handled by one diver, working at 40-ft. depth

By A. R. MacPHERSON
Tacoma, Wash.

IN 1944 the city of Tacoma, Wash., voted a \$3,000,000 bond issue to carry out an extensive sewer construction program. Part of this plan called for the building of nine underwater outfalls, to carry sewage out into the waters of Puget Sound.

The Industrial Engineers & Contractors Co. of Tacoma, which was awarded the contract for the job, has thus far completed three of the outfalls at an average cost of \$45,000 each. In view of the fact that nearly all actual construction must be carried on underneath the waters of Commencement Bay, some interesting and difficult engineering problems are involved, requiring the use of divers.

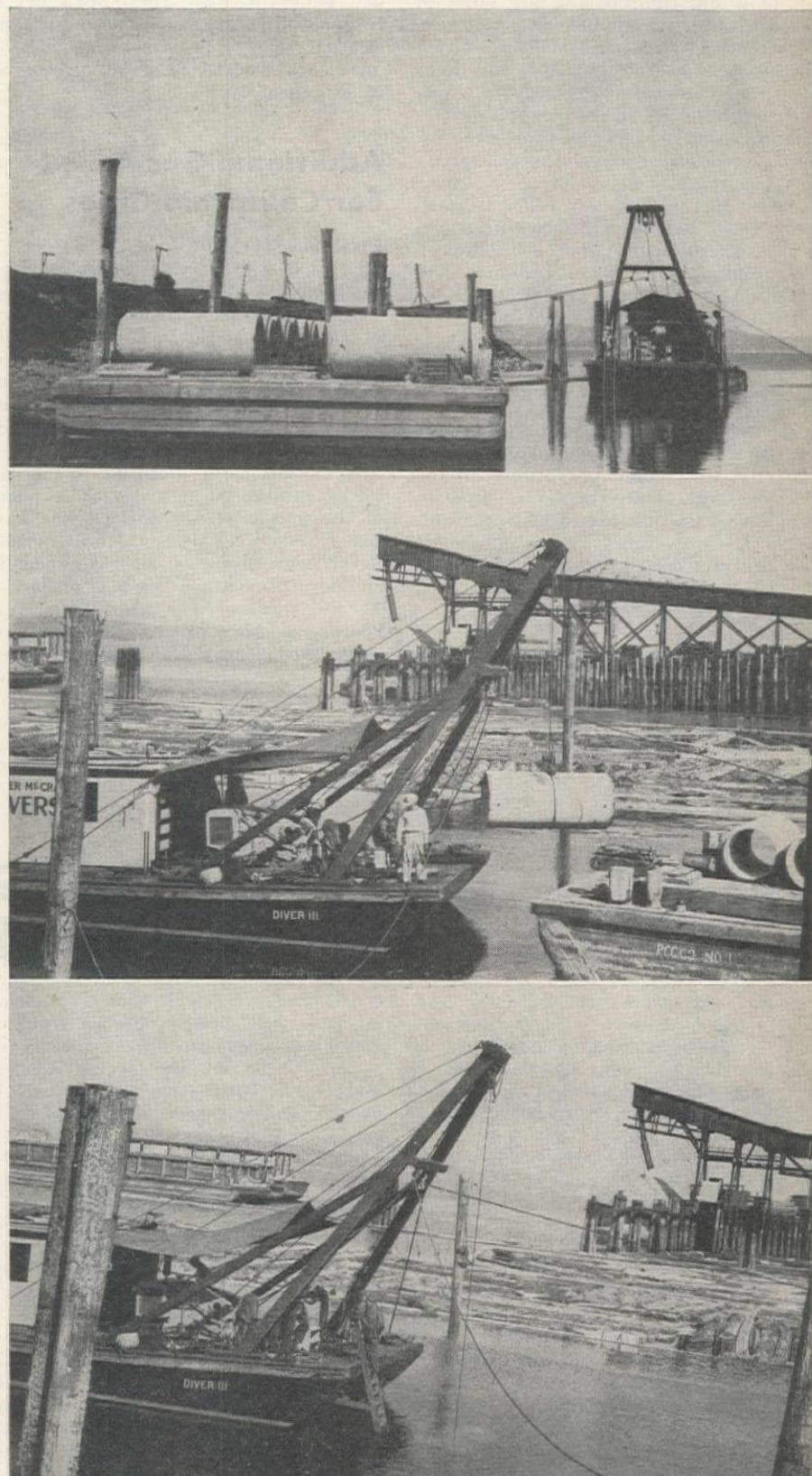
The Walter McCray Divers Co. of Seattle has charge of all underwater operations with Legrand Blackburn, a diver of 9 years' experience, doing the actual work on the bottom of the bay.

The purpose of the outfall extensions is to provide for disposal of sewage into deep water where there will be less harm to fish, greater dispersion, and a minimum of contamination of the salt water beaches. The discharge ends of the outfalls will lie 40 ft. below mean low tide.

The initial operation calls for digging a 627-ft. long trench on the bottom of the bay to a depth of 4 ft. or more. By the use of a pile-driver, and under guidance of the diver, piles are then driven in the trench in pairs. The diver next secures heavy beams across the tops of the piles by means of 24-in. bolts. He then lays a railroad track on the beams down the length of the trench, spiking the rails to the beams.

This trackage serves to provide a level base on which the heavy concrete sewer pipe is laid. The Graystone Concrete Products Co. of Seattle are the suppliers of the pipe, each section of which weighs 4,400 lb., is 36 in. in diameter, 3 in. thick, and 6 ft. long. Pipe is reinforced with wire mesh. Before lifting a pipe section from the adjoining supply barge, a rubber gasket is secured around one end with heavy grease.

Two men on the McCray divers' barge operate the hoisting machinery and air compressors. A section of pipe is lifted



IN PLACING reinforced concrete pipe, 36 in. in diameter, for the Tacoma outfall sewers, a supply of the pipe is brought near the working barge on a supply barge, top. After rubber joint gasket is fitted to the pipe, it is lowered into the water by the crane on the working barge, center. Just beneath the surface, the pipe section is held until the diver straddles it, after which he rides it down to the bottom and secures it in place on pile and rail support structure he has previously placed in position.

off the barge by the hoist, lowered just beneath the surface of the water, where diver Blackburn straddles the suspended section, riding it down 50 ft. to the bottom of the bay. He then maneuvers it into position on the track, and after lining it up, tightens the lug bolts to make a watertight joint.

Sufficient daylight filters down through the water to enable the diver to see his work, and at a uniform working depth of 50 ft. no decompression chamber is necessary. In a normal 6-hr. shift, Blackburn can position and secure 10 or more sections of pipe.

After all the pipe is installed in position, it will be covered over with a dirt fill. It is anticipated that even though the piling and wooden supports will eventually rot out, the fill will then have settled firmly enough to provide permanent and adequate support.

R. G. Anderson, draftsman in the Tacoma Public Works Department, is responsible for designing much of the work involved in the operations, with E. H. White, engineer and inspector for the city, overseeing operations on the diver's barge. Tom Hauser is superintendent of the job for Industrial Engineers & Contractors Co., which holds the contract for the construction of all 9 outfalls.

Engineer Jobs in Missouri Valley

THE ACCELERATED program being carried on by Region 6, Bureau of Reclamation, on its program for development of the water and land resources in the Missouri River drainage basin has created a large number of employment opportunities for qualified personnel.

The most urgent need in the region is for soil scientists, agricultural economists, electrical and civil engineers, agricultural aides, engineering aides and draftsmen. Openings available to scientists, economists and engineers are at salaries ranging from \$2,644 to \$4,149 per year. The aide and draftsmen positions pay \$1,690 to \$3,397 a year.

Personnel entering the employ of Region 6 will be located at the Regional headquarters in Billings, Mont., or at one of its field offices located in Montana east of the Continental Divide, Wyoming east of the divide and north of the Niobrara and Platte River basins, and North and South Dakota.

New employees will be working directly with the program known as the Missouri Basin Project, authorized in the Flood Control Act of 1944 for the development of the natural resources in the Missouri River Basin.

Persons desiring consideration for present or future job openings should complete and forward Federal Employment Form No. 57 to the Regional Personnel Office, Box 2130, Billings.

The application form may be secured from any first or second class post office, the Civil Service Commission regional offices at Seattle, Wash.; St. Paul,

Minn., or Denver, Colo.; or from the Bureau's personnel office at Billings.

Appointments made, other than those awarded as a result of examinations, are considered temporary. However, persons holding temporary appointments will generally have an opportunity to compete for probationary appointments at a later date. Regulations provide that qualified veterans be given preference in appointment.

Additional Gas Asked For California Cities

PERMISSION to send California another 200 million cu. ft. of natural gas daily was asked recently by the El Paso, Tex., Natural Gas Co. in their application to the Federal Power Commission to build a \$55,395,840 pipe line. This project would be in addition to their nearly completed \$53,800,000 pipe line, now being built to deliver 505 million cu. ft. of gas daily to California.

A 438-mi., 26-in. loop line to increase by 100 million cu. ft. a day the capacity of the previously authorized line from Lea County, N. Mex., to the Colorado River near Blythe, Calif., would be included in the company's new project. A 470-mi., 26-in. line from San Juan County, N. Mex., to the California-Arizona border near Needles is also proposed. This would also have a capacity of 100 million cu. ft.

Natural gas deliveries from the new line to Needles would begin about Jan. 1, 1952, with deliveries to Blythe in 1952 or 1953, the company states.

Standards Established On Lightweight Floors

THE AMERICAN Standards Association for the first time has given its official approval to a standard covering lightweight floor construction, S. H. Burgess, managing director of the Steel Joist Institute says in "Industrial Standardization," the monthly magazine of the ASA.

The standard was developed by an American Standards Association committee sponsored by the American Iron and Steel Institute and the American Society of Civil Engineers.

It is intended for use by municipal and state building officials as a means of increasing uniformity in building code requirements. As a complete specification on steel joist construction, it also should be useful to architects and engineers.

The approval of this standard for steel joist construction is particularly significant at the moment because it recognizes a type of construction which lends itself particularly to fire-resisting building construction, Burgess declares.

The standard provides for the use of sections rolled from cold furred strip and sheet in the manufacture of steel joists as well as the use of hot rolled sections. It also provides for the use of nailer joists, with or without wood strip attached.

Steel joists are completely standardized as to lengths, depths, and carrying capacities. They are completely shop-fabricated. They reach the job site tagged and ready for immediate placing.

Truckmen Organize to Advise On Highway Expansion Plans

LEADING Western interstate truck operators have joined together to finance a highway and taxation research organization, to be known as the Western Highway Institute. Its function will be to accumulate research material to be used in facilitating active participation of the Western motor transportation industry in matters of highway financing, location, and construction. In addition, the Institute will operate in close cooperation with the American Trucking Association and other organizations active in the highway transportation field.

The new organization is in charge of directors selected by the Western trucking associations. Officers elected at the first directors' meeting, held in Reno, Nev., on Sept. 13, are: Chairman of the Board, Robert H. Cutler, Portland, Ore.; President, John L. Springer, San Francisco, Calif.; and Treasurer, J. A. Gritsch, San Francisco. Springer, who for many years has been identified with Western highway transportation public relations, will be responsible for the Institute's research program.

In releasing the first public announce-

ment of the newly formed organization, Cutler said, "The West is entering a decade of expanded highway-building activity. The motor transportation industry, which pays for such a substantial share of highway improvements, is naturally vitally concerned in all matters relating to highway planning and development. Through the studies to be undertaken by the Western Highway Institute, we propose to accumulate facts and data which will help us take an even more active interest in such problems than in the past." He revealed that the Institute will soon begin long-range studies in truck taxation, highway planning, and vehicle design. All work will be concentrated in the eleven Western states only.

The Institute has established headquarters at 26 O'Farrell Street, San Francisco 8, Calif. Prior to the recent meeting of its board at Reno, the organization functioned briefly under the pre-incorporation name, Western Motor Carriers Association, and is now being incorporated as a non-profit corporation under the laws of California using the new designation.

Portrait—International Engineer

AIRPORTS from Teheran to Nanking and from Buenos Aires to New Delhi are beginning to recognize a familiar figure in the person of C. P. Dunn, Chief Engineer and Vice-President in Charge of Foreign Operations of Morrison-Knudsen Company, Inc. Armed with his favorite pipe and a plentiful supply of Brindley's Mixture, Mr. Dunn is fast adding to a record of passenger miles flown that already has passed the million mark. During the first seven months of 1947 he made overseas visits to Iran, Afghanistan, India and the Argentine in addition to several cross-country jaunts within the boundaries of the United States. Fortunately, Dunn thoroughly enjoys these commuter hops to remote parts of the world although one day he hopes to have enough time on his hands to cross an ocean in old-fashioned comfort, by ship.

Dunn was born in Iowa fifty-nine years ago and follows an established Iowa tradition by now making his home in California. He studied civil engineering at Washington State College and between 1908 and 1921 laid the foundation of his vast construction experience by first working on surveys and then as field engineer, resident engineer and assistant engineer on the design and construction of railway, bridge, tunnel and hydroelectric developments. The next five years were spent with the Portland Electric Power Company of Portland, Ore., in charge of design. During this period he designed the \$10,000,000 Oak Grove project and in 1926 was made chief engineer of the company in charge of all engineering for the Light and Power Department.

Between 1929 and 1931 he was Chief Engineer for the Alcoa Power Company, in charge of design for the \$20,000,000 hydroelectric development on the Saguenay River. Then, one day in 1933, he said to an associate, "I've a letter here offering me a job on the West Coast—and I think I'm going to take it."

Back to the West

The job was to assist in the preparation of bids for the foundations of the West Bay section of the San Francisco-Oakland Bay Bridge. When the bids were accepted he was appointed Chief Engineer for the Transbay Construction Company which erected the caisson piers, and since that time until the end of 1946 has headed all engineering for Morrison-Knudsen as Vice-President and Chief Engineer. He is now President of International Engineering Company, Inc., and Vice-President and General Manager of M-K International. By a recent appointment of the Chinese Government he is a member of the Yellow River Study Board.

Mr. Dunn, with vivid memories of the San Francisco Bay mud, considers construction of those caisson piers as probably his toughest job, but the most spectacular—although according to him "it couldn't miss"—was the dam at Chute



Internationalist C. P. DUNN

Chief of foreign operations for Morrison-Knudsen Co., Inc., is accustomed to think and to plan in terms of world achievement—Monuments to his ability include the pre-constructed dam on the Saguenay River in Canada, Bay Bridge piers, underground oil storage in Hawaii, and huge tanks at Hanford A-plant

By BETTY THOMPSON
San Francisco, Calif.

a Caron on the Saguenay River in Eastern Canada. In order to avoid diverting the extremely swift river it was necessary to build the dam on its side and then topple it over into the water.

Needless to say, this casual tossing about of a structure 92 ft. high, 38 ft. thick and 45 ft. wide, and weighing 22,000,000 lb., created considerable comment and a certain amount of headshaking among the natives, particularly since only once before had a similar project been completed. There was an "I told you so" atmosphere when the charge was set off that was to send the finished structure to its permanent position in the river, and nothing happened. However, the second try—plus an extra-generous amount of T.N.T.—did the trick. A photograph of the Obelisk as it was called appeared on the cover of the first issue of the *Civil Engineering* magazine.

Charley Dunn is equally well-known for his ability in the field of heavy construction and for an easy, dry humor that packs a terrific wallop when he really lets it loose. He takes nothing too seriously, least of all himself, and has an inexhaustible collection of stories that are as welcome around the council table as on a field trip.

Farther and braver

His long-time friend and associate, Don Bleifus, likes to tell about an incident that occurred after the completion of the above-mentioned Saguenay Dam, on which the two men worked together. The dam was handling its full scheduled

spillway capacity of 70,000 cu. ft. of water per second when Dunn received a telegram from a Company executive in conference with Canadian Government officials in Quebec. They requested that the release of water be stepped up to 85,000 sec. ft. The request was somewhat reluctantly complied with and almost immediately another telegram arrived from the same man, only this time from Montreal and asking for a second increase up to 95,000.

While Bleifus and Dunn were dubiously considering the new situation from a vantage point on the dam, which was quivering dangerously underfoot, a third telegram was delivered. Dunn read it through without expression and silently handed it to Bleifus, who read and returned it also without comment. This one was from Toronto, requesting a further increase to 105,000 sec. ft.

Very deliberately Dunn took out his pipe, filled and lighted it. Then, after a couple of long puffs, he said quietly, "The farther away that fellow gets, the braver he is!"

Dunn's relaxed approach to life is reflected in the atmosphere of his San Francisco office where everyone finds him a grand guy to work with, contradicting his own statement that he returns from his many trips "meaner than Hell." He's also a reassuring man to have around when the going gets tough and is called all over the country to doctor "sick" jobs. Construction superintendents who have run into trouble notice that after Dunn has spent a couple of days looking over the situation they suddenly know just how to go ahead. After thinking it over they generally hand him the credit.

During the war he worked on the tank construction at the Manhattan Atomic Bomb Plant project near Pasco, Wash., and was largely instrumental in designing the 20 huge Naval underground fuel storage tanks at Pearl Harbor. This last job rates the honor of being the "biggest hole ever dug underground."

Internationalist attitude

His present position with M-K, which takes him to every part of the world, demands that he be an internationalist in his thinking as well as an engineer. He has the enviable ability to get along equally well with Prime Ministers and Master Mechanics, and was never more at home than during a recent tour around India where he was the only non-Indian member of the party. Perhaps it ties in with his generally unhurried attitude but where most Americans are irritated by the Asiatic disregard for time, Dunn finds himself able to see their point of view.

He has had ample opportunity to inspect the construction work of other nations and feels that the Swiss come nearest to doing things our way, possibly because like us they can draw on the best abilities of several nationalities. He



CHARLEY DUNN is well-known in many parts of the world. In the bleak Arabian desert, where, above, he is shown taking coffee with a group of tribal noblemen, or in highly technical counsels of the greatest engineers, he is known and vastly respected.

believes that the Germans, although technically proficient, were too methodical and unemotional to turn out the overwhelming jobs that succeed through leadership and technical knowledge.

As he travels from one confused, discouraged country to another Mr. Dunn is becoming more than ever convinced of the need for full production as the only method for starting up stalled world economy. No nation can in the final analysis hope to use more than it produces. While the United States alone can not hope to supply the rest of the world, he thinks that we can and should offer the benefit of our vast production

experience to all nations that request it.

Since much of the big construction of the future will be built outside the United States, it is interesting to note that construction efforts in the Asiatic countries face their greatest difficulties in the transportation of supplies and lack of trained-on-the-spot personnel. These countries however, do have at their disposal unlimited manpower which, properly guided, could produce astonishing results. In comparing American and Asiatic construction methods, the final cost of a job may be approximately the same but American methods can cut the time in half.

Mr. Dunn is a member of the American Society of Civil Engineers. He is married to the former Lillian Hulseman of Washington and they have one son, Robert C. Dunn, a mining engineer with the Merrill Company. Incidentally, the three Dunn grandchildren have an excellent collection of authentic foreign costumes—a collection that receives additions every time their grandmother makes another trip with her husband. An engineer's life demands frequent and often prolonged absences from home. Mr. Dunn feels that his wife's patience and understanding of this fact have been a big help to his career.

Although his ability to plan and to estimate the cost of a job is unsurpassed, Mrs. Dunn has a very low opinion of her husband's effectiveness as a gardener. She finds that the man who understands some of the world's largest and most complex machinery is amazingly inexpert with a hoe. However, Dunn has always found his work too absorbing to develop outside hobbies. Since he manages the difficult feat of devoting himself to his job and yet never working at it, he has also escaped developing ulcers.

His skill as a poker player may have some bearing on his ability as a negotiator, although his popularity with competitors is proof that his business dealings are always managed without throat-cutting.

He is openly impatient of so-called experts whose theoretical knowledge is not backed up by practical experience but friends say that there is only one time when you'll see Charley Dunn really angry. That is when out on a field-trip someone asks to borrow his comb, an article for which he and General Eisenhower have about the same amount of use.

State Engineers Criticize Bureau

URGING THAT the Bureau of Reclamation be returned to the control of experienced and qualified engineers, state engineers of the seventeen Western states at their twentieth annual meeting held in Boise, Idaho, Sept. 9-13, approved a resolution criticizing in outspoken terms the policies of present Bureau of Reclamation administrators. While the meeting was climaxed by majority approval of the resolution, much of the three-day meeting was devoted to constructive criticism of existing federal reclamation law into which crept occasional notes of disapproval concerning reclamation policies adopted by high administrative officials.

With Mark R. Kulp, state reclamation engineer of Idaho and president of the association, presiding, the meeting was turned over, following the customary welcomes, to a discussion of the changes considered necessary to improve the operation of federal reclamation laws in each of the Western states. This discussion, which formed the principal subject of each state engineer's report, was

Twentieth annual meeting of Western State Engineers hears reports from each state outlining suggested changes in Bureau of Reclamation policy which would be valuable to that state, then urges appointment of more capable Bureau executives

carried intermittently through the formal program, and set the general tenor of the meeting. Eleven of the seventeen state engineers and representatives of two other state engineers were present, with four of the seventeen Western states not represented.

State Engineer reports

ARIZONA, O. C. Williams, State Water Commissioner: Three major changes needed in the federal reclamation law are correction of the solicitor's opinion, extension of the repayment period for irrigation costs, and provision for inclusion of benefits for salinity and silt control to be charged against project costs. Projects which meet present feas-

ibility requirements have been nearly exhausted within the state, and some easing of requirements must be accomplished to bring additional lands under irrigation.

CALIFORNIA, E. W. Hyatt, State Engineer: Although early irrigation projects in the state were developed without federal assistance, the situation is now changing to place increasing dependence upon federal reclamation laws. Excess land provisions of the law are not workable under all circumstances and should be modified. In regard to feasibility each project should be founded on sound economic principles similar to those necessary to the operation of private enterprise. The Bureau

of Reclamation should be prevented from setting up projects in such a manner that permanent control of the project will remain with the Bureau. Controversy between the Department of Interior and the Corps of Engineers is holding back development of some projects, and differences should be resolved to permit work on those projects to proceed.

IDAHO, M. R. Kulp, State Reclamation Engineer: Two additional divisions should be established within the Bureau of Reclamation, a drainage division and a small projects division. A primary need of the Department of the Interior is a public power policy with a well defined relation to reclamation. The variation in unit construction costs between various projects may be leveled by application of power income, but power sales below the cost of generation and distribution will handicap irrigation development.

KANSAS, R. V. Smrha, Deputy Engineer of Water Resources: The chief need is the expediting of projects by the Bureau of Reclamation in order to complete construction and get land under irrigation. Procedure for the formation of water districts in the state needs court determination.

NEBRASKA, D. S. Jones, Deputy State Engineer: Excess land provisions of the reclamation law will cause difficulty in any future project considered for construction. The Bureau of Reclamation is claiming all rights to water on current projects in opposition to state law. The principal difficulties rest largely with promoters of irrigation projects rather than with reclamation law.

NEVADA, A. M. Smith, State Engineer: Marginal irrigation projects partially subsidized by power profits may eventually prove profitable through the establishment of supporting enterprises. Support of the Rockwell Bill is considered to be support of multiple purpose projects.

NEW MEXICO, J. H. Bliss, State Engineer: The 160-ac. farm limitation will cause difficulty if the Bureau of Reclamation takes over some of the older New Mexico irrigation projects. Future projects in the state will be of the large, multiple-purpose type and improvement of smaller projects where additional storage is required.

NORTH DAKOTA, J. J. Walsh, State Engineer: Excess land provisions do not take into account the needs of the individual farmers. The Bureau of Reclamation should be permitted to assist in land preparation, although because of machinery development and use the long periods for preparation of land to use irrigation water are no longer needed. The Bureau of Reclamation should consider the possibilities of constructing irrigation works without prior agreements having been made with water users or irrigation districts.

OKLAHOMA, Forrest Nelson, Director, Division of Water Resources: An inter-departmental agency similar to

the Columbia Basin Inter-Agency Committee is needed for the development of the middle basins of the Red and Arkansas Rivers. When individual projects fail to meet feasibility requirements comprehensive basin plans will frequently help to justify. Consideration should be given to the possibilities and a study made of a variable repayment schedule to replace the present rigid annual expense to irrigators. A variable repay-

ment schedule would be based on productivity and crop returns of an individual project. A provision for local option to determine the economic size of farm units could overcome the objection to the excess land provisions.

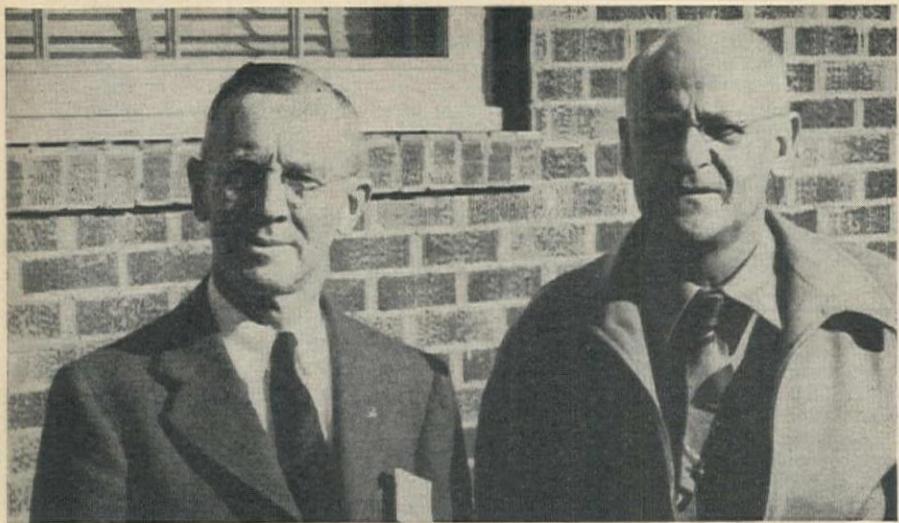
OREGON, C. E. Stricklin, State Engineer: Possible multiple purpose projects are definitely lacking in the state. Potential irrigation projects are small and few will be capable of repayment without a subsidy. There are many major potential power projects which could provide a subsidy from the profit resulting from power sales to assist in building the less feasible irrigation projects.

UTAH, E. H. Watson, State Engineer: The requirement for repayment of firm obligations over a stated period is a fundamental defect of the reclamation law. It fails to provide for changing economic conditions affecting the financial status of the water user. Establishment of a method of varying water use rates dependent upon the ability to pay each year would save the expense of renegotiating contracts at frequent intervals. The Bureau of Reclamation is spending too much money for administration and economic surveys at the expense of project construction.

WASHINGTON, Rodney Ryker, Supervisor, Division of Water Resources: To permit the development of new irrigation projects it will be necessary to have either a low power rate for pumping or a subsidy from power sales. An increase in the \$17.50 basic power rate will be opposed.

WYOMING, L. C. Bishop, State Engineer: A change is needed in the repayment provisions to permit the average man to succeed on an irrigation project. The 160-ac. limitation should not apply to projects where only supplemental water is being furnished. Commissioner Straus of the Bureau of Reclamation has refused to abide by the terms of agreement between the four states of the upper Colorado River Basin as to the use of the Colorado River development fund. Although representatives of the states of Colorado, New Mexico, Utah, and Wyoming agreed that the \$500,000 received annually from the power sales at Hoover dam should be split equally for project investigations in the four states, the bulk of the funds has been going to Colorado and Utah. New Mexico and Wyoming have each received less than 15 per cent of the funds in spite of the fact that both states have potential projects in need of investigation.

Commenting on the same subject, Don W. McBride, secretary-manager of the National Reclamation Association, said that reclamation laws have been outmoded to some extent because of the fact that laws passed for the benefit of individual projects have been added to the general reclamation policy. Reclamation has also been hindered by the fact that different departments, such as the Bureau of Reclamation, the Corps of Engineers, and the Soil Conservation Service, although working in the same



RETIRING and incoming presidents of the Association of Western State Engineers. **MARK R. KULP**, left, of Idaho, 1947 president, and **O. C. WILLIAMS**, of Arizona, new executive. Convention for 1948 will be held at Grand Canyon.

areas and toward the same objectives, operate under different rules. The Rockwell Bill (HR 2873) is not considered a cure-all but a step in the right direction, and the National Reclamation Association will urge passage of the bill.

Urge irrigation research

In the first of the formal papers delivered during the meeting, George W. Craddock, Intermountain Forestry Experiment Station, Ogden, Utah, explained that proponents of watershed management do not claim that it can halt normal erosion or carrying away of silt. Erosion is not held to be due to high intensity rainfall and saturated soil, but to destruction of protective cover, and the first requirement in most areas is a change in land use methods.

Operation of two fundamental water right court decisions, the Stewart and Bryan decrees which provide for sliding scale cuts in delivery of irrigation water, was explained by William E. Welsh, watermaster for the Boise River. Although both cases are still pending in the courts for determination of the duty of water, Welsh stated that an arbitrary determination would never prove satisfactory because of constantly changing conditions.

Col. Theron D. Weaver, North Pacific Division engineer, Corps of Engineers, outlined some of the corollary problems in connection with project development. He cited such major undertakings in themselves as the construction of 29 mi. of levees and 89 mi. of railroad above McNary dam on the Columbia River, and railroad and highway relocations required as a preliminary to construction of Detroit and Meridian dams on tributaries of the Willamette River.

The need for research in irrigated agriculture was emphasized by George D. Clyde of the irrigation division of the Soil Conservation Service at Logan, Utah. The present efficiency of irrigation is only 25 per cent, Clyde told the state engineers, and this is not sufficient to support the estimated U. S. population of 170 million 25 yr. from now. Not

only must more land be brought under irrigation, but the present efficiency must be raised through a program of federal and state research into soil and water use.

The problem areas for basic research, Clyde indicated, include source and storage characteristics, water requirements and losses, structures for control of water, human relationships in the development of organizations, rehabilitation of older systems, and erosion under irrigation. Such a program should include both fundamental and applied research. "Why spend billions," asked Clyde, "in developing new water resources when we are only using efficiently 25 per cent of our present resources?"

State control of water

John C. Beebe, assistant to the Federal Power Commission, urged the Association of Western State Engineers to take a more important place in the future planning and development of the natural resources of the West. The association needs a closer unity among its members, Beebe said, and suggested that the members consider the possibility of employing a staff consultant.

Discussing legislation and court decisions relative to the control of water rights, Fred M. Taylor, Idaho state senator, stated that protective clauses in authority-type bills would be ineffective as far as reserving water rights for state jurisdiction is concerned because they would be subject to change by Congress at any time. Taylor pointed out that wherever the federal government has assumed control of water rights state control has been ineffective, and the passage of authority bills would constitute assumption of such control.

Carl G. Paulsen, chief hydraulic engineer for the Geological Survey, asked the state engineers to keep their representatives in Congress informed as to the needs of the cooperative underground water studies. The association, he said, was instrumental in securing approval for the present appropriations.

Five major Bureau of Reclamation projects are expected to be short of funds before the end of the current fiscal year, according to Kenneth D. Markwell, assistant commissioner of reclamation, who spoke at the annual dinner meeting. The five projects are the Columbia Basin, Yakima-Roza, Colorado-Big Thompson, Davis dam, and Central Valley.

Approval of the Rockwell Bill by Congress will be of material advantage to water users, Markwell indicated, in that it will permit re-examination of existing projects for contributions to preservation and propagation of fish and wild life, salinity control, silt control, and recreation which would serve to increase the non-reimbursable allocations.

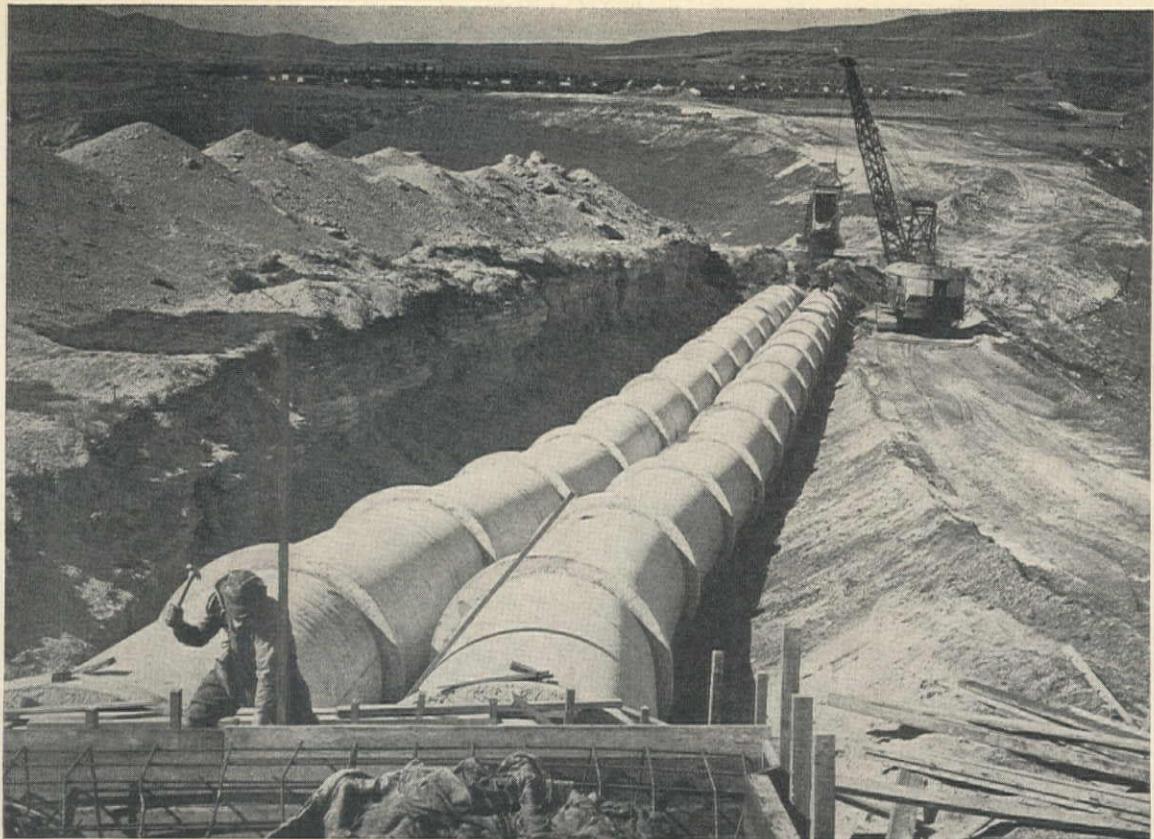
Resolutions

Ten resolutions were approved by the state engineers at the final business session. In their essence the resolutions asked: (1) that Congress formulate and adopt an impartial and well coordinated policy for water and soil resource development; (2) that Congress adopt a continuing policy of assuring adequate funds to the Geological Survey for cooperative water resource studies, and also a policy of appropriating non-cooperative funds for securing additional data on water resources; (3) that HR 2873 be enacted at the earliest possible time; (4) that Congress support an irrigation and drainage research program in the division of irrigation of the Soil Conservation Service in cooperation with state agricultural agencies; (5) that Congress support the snow survey program of the Soil Conservation Service; (6) that Congressional representatives of the Western states unite in proposing and supporting legislation affirming state ownership of submerged lands and resources; (7) that additional efforts be made by the proper federal agencies to sustain and expedite the topographic mapping program on a co-ordinated basis.

New officers

O. C. Williams, State Water Commissioner of Arizona, was unanimously elected president to succeed Mark R. Kulp, and J. J. Walsh, State Engineer of North Dakota, was elected vice-president. Williams announced the appointment of C. W. H. Smith, Assistant State Water Commissioner of Arizona, as secretary. The new officers will not take office until Jan. 1, 1948, in order to permit the retiring officers to conclude the business resulting from the annual meeting in accordance with a constitutional amendment adopted at the meeting. The 1949 annual meeting was tentatively set for late August at the Grand Canyon in Arizona.

The last day and a half of the meeting was spent inspecting several Idaho reclamation projects. Half a day was spent inspecting the construction of Cascade dam and attending a barbecue at the site in honor of the House Public Lands Committee and sponsored by the Southwestern Idaho Water Conservation Project, Inc.



FIRST CONTRACT on Jordan Narrows siphons was for installation of 1,800 ft. of 69-in. precast concrete pipe from the intake to the beginning of the high head steel pipe. It was installed by Carl B. Warren, and is shown being backfilled.

Provo River Project— Siphon and Pump at Jordan Narrows

One pipe of twin-barreled siphon will carry irrigation water from Deer Creek Reservoir directly to canals on west side of Jordan River, while second pipe will act as combination siphon and penstock for turbine direct connected to pump, for lifting additional water from the flow of the river

THE JORDAN NARROWS Siphons, situated approximately 22 mi. due south of Salt Lake City, are a unit of the Deer Creek Division of the Provo River Project. This project, which constitutes the largest reclamation development in the state of Utah, is being constructed by the Bureau of Reclamation to solve complicated water supply and conservation problems for about 100,000 ac. of irrigated land in Utah Lake and Great Salt Lake valleys and for the Metropolitan Water District of Salt Lake City.

A review of the problems involved and the design of the project to meet these problems appeared in the *Western Construction News* for October, 1939. Arti-

By ROBERT W. JENNINGS
Resident Engineer,
Bureau of Reclamation
Provo, Utah

cles describing construction on the Deer Creek Dam and Salt Lake Aqueduct have also appeared in previous issues (November, 1939, and November, 1940, respectively).

Only the details of the water supply problems involved on the project as they affect the Jordan Narrows Siphons will be described in this article.

General outline

The Deer Creek Division includes the Deer Creek Dam with the relocated rail-

road and highway, the Duchesne Tunnel, the Weber-Provo Diversion Canal, and the enlargement of the Provo Reservoir Canal and the Jordan Narrows Siphons. Construction work has been completed on the Deer Creek Dam and related features and on the Weber-Provo Diversion Canal. Two and three-tenths miles of the Duchesne Tunnel have been excavated to date with 3.7 mi. remaining to be constructed. The Provo Reservoir Canal and the Jordan Narrows Siphons are the only units of the Deer Creek Division on which construction work is currently being performed.

The Aqueduct Division of the Provo River Project, which consists of the construction of about 41 mi. of covered conduit with a capacity of 150 cu. ft. per sec., is the other unit of the Provo River Project on which construction work is being done. The Salt Lake Aqueduct will convey water from the outlet works at the Deer Creek Dam to the Sam Park Reservoir in the vicinity of Salt Lake City.

With all construction work on Schedule No. 1 of the Jordan Narrows Siphons completed and with construction work started on Schedule No. 2, the Bureau

of Reclamation now plans to complete this highly important unit of the Deer Creek Division of the Provo River Project in time to deliver irrigation water to project lands during the 1948 irrigation season. These siphons will replace an existing siphon and will convey water from the enlarged Provo Reservoir Canal on the north bank to the south bank of the Jordan Narrows, where water will be delivered into four canals with provisions included for future delivery of water to a fifth high-line canal. Also, one siphon or penstock will furnish power for pumping of irrigation water from the Jordan River to one of the lower canals.

Historical background

The original Provo Reservoir Canal and the existing Jordan Narrows Siphon were constructed by the Provo Reservoir Co. during the period from 1909 to 1914 to supply irrigation water to lands west of Jordan River in Utah and Salt Lake Counties. The old siphon was designed for a maximum capacity of about 110 sec. ft. and at the present time is in a very poor operating condition. The original design did not utilize all the head available at this location and did not provide sufficient capacity to furnish water to all lands which can be served from the existing distribution system.

The existing irrigation system of the Utah Lake Distributing Co. (operating company) was constructed by the Utah Lake Irrigation Co. (promotion and construction company) during the period from 1911 to 1914. The system consists of a pumping plant located on the northwest shoreline of Utah Lake approximately two miles southwest from the outlet of Utah Lake to the Jordan River, the necessary pumping equip-

ment and discharge lines for lifting water from the lake to a height of approximately 114 ft., and the existing distribution system.

The distribution system includes 9 mi. of canal running from the discharge line at the pumping plant to the Jordan Narrows, 4,180 ft. of concrete lined tunnel through the steep and restricted area at the Narrows, and 21 mi. of canal running northwesterly from the Narrows into Great Salt Lake Valley. To facilitate the removal of excavated material during the construction of this tunnel, an adit was constructed at about the mid-point. The outlet from this adit, which had been obliterated by subsequent construction, was recently re-excavated. Upon inspection, this adit, which had been constructed through a cemented gravelly formation and which had never been supported, was found to be in good condition. Because of its convenient location, the adit will be utilized for delivering water to the existing canal system.

The Utah Lake Distributing Co. operated successfully for a number of years, but the high cost of pumping and the receding of the lake level during the drought and depression years of 1931 and 1934 forced the company to discontinue operations. Since the irrigation season of 1934 the company has only operated their pumping plant at short intervals and has delivered only a fraction of the water required for the irrigation of lands previously served. During the period of full operation the distrib-

GENERAL PLAN of the Jordan Narrows Siphons, showing location of the pumping house for recovering Utah Lake water owned by Utah Lake Irrigation Co. from the Jordan River, also discharge points for the several canals.

uting company established a water right for the use of approximately 33,000 ac. ft. of water from Utah Lake.

Problems involved

The problems involved in the design of the new siphons included the replacing of the existing Provo Reservoir Company siphon, the furnishing of additional water to the existing distributing systems, the providing for future development, and the elimination of pumping costs to the Utah Lake Distributing Co., while at the same time utilizing to the fullest extent possible their water rights in Utah Lake. Preliminary studies indicated that the construction of two individual siphons would be required to meet these conditions.

The maximum capacity requirements of the planned canal system, as determined by an extensive study of irrigation water requirements of the lands to be served, are as follows:

Provo Reservoir Canal,

North Branch 100 c.f.s.
South Branch 40 c.f.s.

Utah Lake Distributing

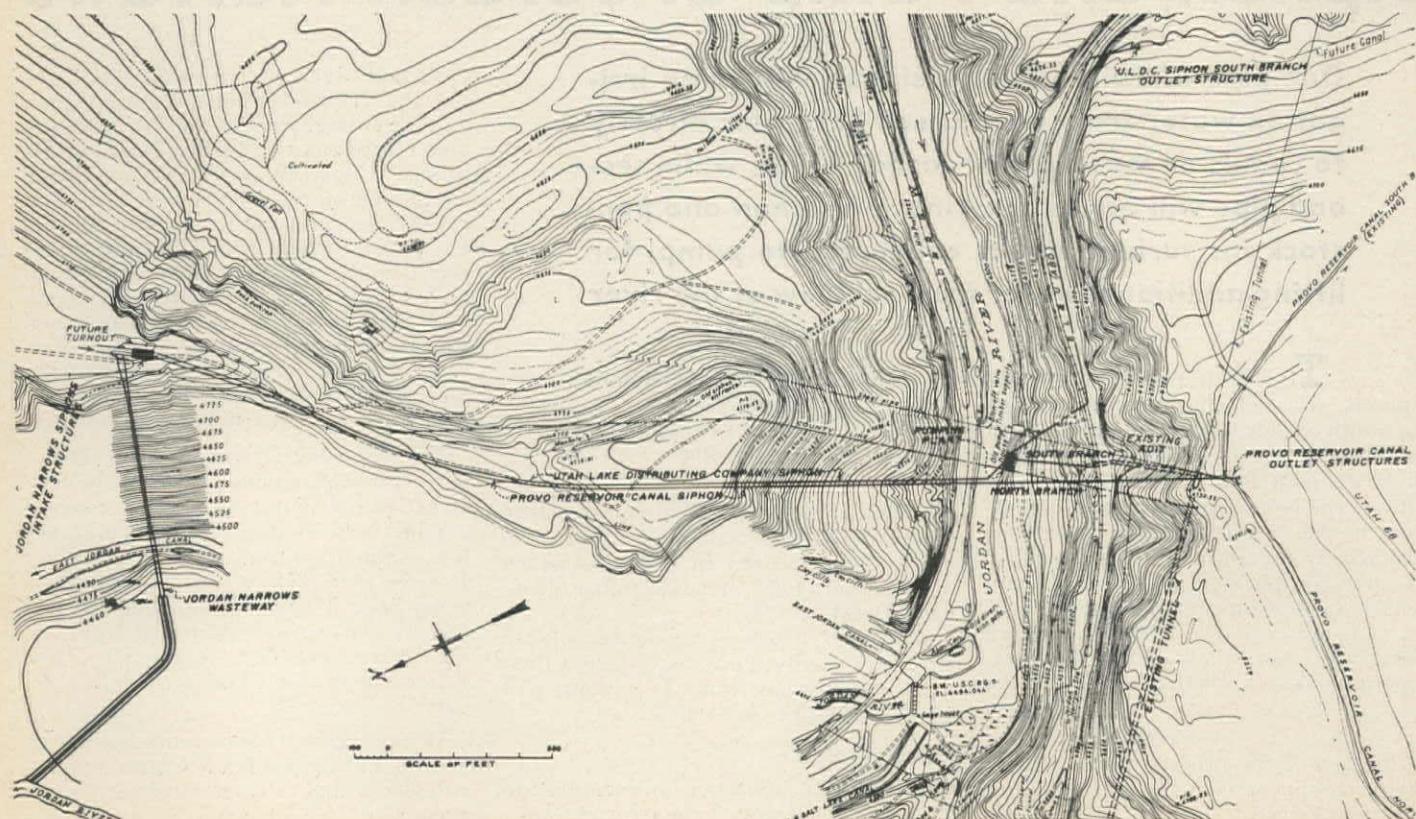
Co. Canal, North Branch. 90 c.f.s.
South Branch 40 c.f.s.

West Valley Canal

(future development) 100 c.f.s.

The delivery of water to the two branches of the Provo Reservoir Canal and the providing of facilities for the future delivery of water to the proposed West Valley Canal present no unusual problems and will be accomplished through the construction of the Provo Reservoir Canal siphon.

The delivery of water to the lands previously supplied by the Utah Lake Distributing Co., which involves the



elimination of pumping costs and the fullest possible use of the company's existing water rights, presents a somewhat involved problem. The plan worked out by the Bureau of Reclamation required the company to subscribe for 15,200 ac. ft. of storage water in Deer Creek Reservoir, the water to be conveyed in the enlarged Provo Reservoir Canal to the Jordan Narrows, and the 15,200 ac. ft. of water to be used to furnish power for the lifting of approximately 18,000 ac. ft. of water from the Jordan River.

Under this plan the company had to make the necessary arrangement to change their point of diversion of water from Utah Lake to a point on the Jordan River at the Jordan Narrows and will have to construct approximately 9 mi. of new canal (South Branch Canal). This plan was agreeable to the company, and the necessary repayment contracts for completing the construction have been executed with the Government. The Utah Lake Distributing Co. Siphon, which will also act as the penstock pipe for a turbine directly connected to a centrifugal pump, will be constructed to accomplish this purpose.

Design features

The enlarged Provo Reservoir Canal at its inlet to the Jordan Narrows Siphon has a design capacity of 350 sec. ft. Forty-five second feet of water will be diverted to satisfy exchange agreements either into the Jordan Narrows Wasteway or into the existing siphon, where it will be conveyed to the Jordan River; the remaining 305 sec. ft. is measured and divided at the intake structure to the siphon with 240 sec. ft. flowing into the Provo Reservoir Canal Siphon and 65 sec. ft. flowing into the Utah Lake Distributing Company Siphon - penstock.

Provo Reservoir Canal Siphon

The Provo Reservoir Canal Siphon consists of approximately 1,800 ft. of low head, 69-in. precast concrete pipe and about 1,600 ft. of high head, 69-in. steel pipe.

The siphon will convey water from the intake structure to the south bank of the Jordan Narrows, passing underneath the main line tracks of the Denver & Rio Grande Western Railroad and the Jordan River to the old outlet structure of the existing siphon, where 40 sec. ft. of water will be discharged to the south branch and 100 sec. ft. to the north branch of the existing canal system.

The water surface elevation of the discharge to the branch canals is at a point 48 ft. in elevation below the water surface elevation (4789.0) at the inlet structure. A temporary bulkhead will be placed in the 69-in. diameter steel pipe, a short distance downstream from the bifurcation section, and the designs include the future extension of this siphon for a distance of about 1,800 ft., to a water surface elevation of 4770.0, from which point a future highline canal will be located running northwesterly into Great Salt Lake Valley.

Discharge from the Provo Reservoir



PLACING RUBBER gasket on spigot end of a 20-ft. section of 69-in. precast concrete pipe prior to placing in the siphon. The gaskets are prefabricated to exact size and must be stretched to fit into their proper place by strenuous manual labor.

Canal Siphon to the branch canals will be controlled by free discharging butterfly type valves, in order that adequate control can be maintained of the water surface at partial discharges at the inlet structure to the siphon, thus restricting all turbulence and air entrainment at this point to the reinforced section of the inlet structure. Sufficient head is to be provided to insure delivery of water to the future West Valley Canal.

Utah Lake Distributing Co. Siphon

The Utah Lake Distributing Co. Siphon, which is the penstock pipe for the turbine, consists of 1,800 ft. of low head, 69-in. precast concrete pipe similar in all respects to the low head section of the Provo Reservoir Canal Siphon. The two pipes are laid in the same trench with a 24-in. clear distance being maintained between the pipes. The concrete pipe is then connected to a short section of 69-in. steel pipe, which in turn "transitions" to a 48-in. steel pipe.

The 48-in. pipe continues for a distance of 948 ft. to the Jordan Narrows Pumping Plant, where it will be connected to a 1,000 hp. hydraulic turbine. The turbine will be directly connected to a 65-sec. ft. centrifugal pump. The 48-in. pipe follows the same location and will be laid in the same trench as the 69-in. pipe for the Provo Reservoir Canal Siphon until the siphon reaches a point directly underneath the Jordan River. At this point the 48-in. pipe diverges to make the required connections at the pumping plant.

The discharge line from the turbine consists of 344 ft. of 48-in. steel pipe which runs from the pumping plant up the south bank of the Narrows to the abandoned grade of the Utah and Salt Lake Railroad. At this point it is connected by a short transition to a 36-in. concrete pipe which follows the railroad grade in an easterly direction for a distance of 1,220 ft., until suitable terrain is reached for the construction of the outlet structure and the earth canal for the

South Branch of the Utah Lake Distributing Co. Canal. The South Branch of this canal is located at an elevation high enough to allow the company to construct new canal in a southwesterly direction from the outlet structure and be able to supply irrigation water to lands previously supplied by water pumped from Utah Lake.

The discharge line from the 65-sec. ft. pump consists of 260 ft. of 48-in. steel pipe located up the south bank of the Narrows from the pumping plant to the old adit of the existing tunnel. Water pumped through the discharge line will flow by gravity through the adit and existing tunnel into the present distributing system, which is now known as the North Branch of the Utah Lake Distributing Company Canal.

The designed water surface elevations for the siphons and discharge pipes are as follows: intake structure to the siphon, 4789.0; outlet to the South Branch Canal, 4625.0; and outlet to the North Branch Canal, 4578.0. The average water surface elevation in the Jordan River during the season when pumping will be required is 4487.0. For these conditions, with allowance for friction and other losses, there is available a net effective head of approximately 150 ft. for operation of the turbine, and the total dynamic pumping head on the 65-sec. ft. centrifugal pump is about 103 ft. For normal operation, bypassing of 20 to 35 sec. ft. of water is required from the turbine discharge line to the pump discharge line.

Pipe design

The 69-in. precast concrete pipe used for the low head sections of the two siphons is of the same design as the pipe being used for the construction of the Salt Lake Aqueduct. The pipe is manufactured in 20-ft. lengths with integral bell and has a $7\frac{1}{2}$ -in. wall thickness. The pipe joint is of the bell-and-spigot type with a rubber gasket provided to form a water-tight joint and grout or dry calk

rings on both inside and outside of the joint. Recesses are provided for the rubber gasket, the grout ring on the outside, and for the dry calk ring on the inside of the pipe joint. A hydrostatic test made of the two 1,800-ft. completed sections of the siphon showed an average loss of 653 gal. of water in a 24-hr. period from each siphon.

The steel pipe designed for the construction of the siphon and discharge lines is of conventional welded plate steel design. The pipe will, in general, be shop-fabricated in 30-ft. lengths, and the interior and exterior surfaces will be coated with coal tar enamel, except within a distance of 9 in. of field joints. Manways are provided at not to exceed 500-ft. intervals to facilitate the field welding and coating of the field joints and to provide ventilation during these construction operations. Closing sections of steel pipe, which are fabricated with excess length, are provided on the down-hill side of all bends in order that the pipe may be field-cut to make the proper joints. All field joints, except final closure joints, will be single-welded butt joints with backing-up strips. In the fabrication of the pipe the backing-up strip will be welded to the uphill end of each pipe section to form a bell-and-spigot joint for field laying. The designs include the encasement of the steel pipe in concrete where the pipe passes underneath the railroad and the Jordan River. All steel pipe, except the pipe in the encasement sections, will be fabricated with stiffener rings at 10-ft. intervals.

Pumping plant and auxiliaries

The general layout of the pumping plant, turbine, pumps, and auxiliary equipment is shown on the accompanying drawing. The plant will be of reinforced concrete design throughout. In order not to delay the construction of the pumping plant due to anticipated delay in the receipt of equipment and steel pipe, the design of this structure will include blocked-out sections where equipment or pipes pass through wall sections or are to be embedded in concrete in the substructure of the plant. Extra reinforcement will be placed in walls and girders where required to support the superstructure of the plant over these blocked-out sections. The blocked-out portions of the walls and substructure will be placed as second stage concrete after the required penstock, discharge pipes, and equipment have been received and installed.

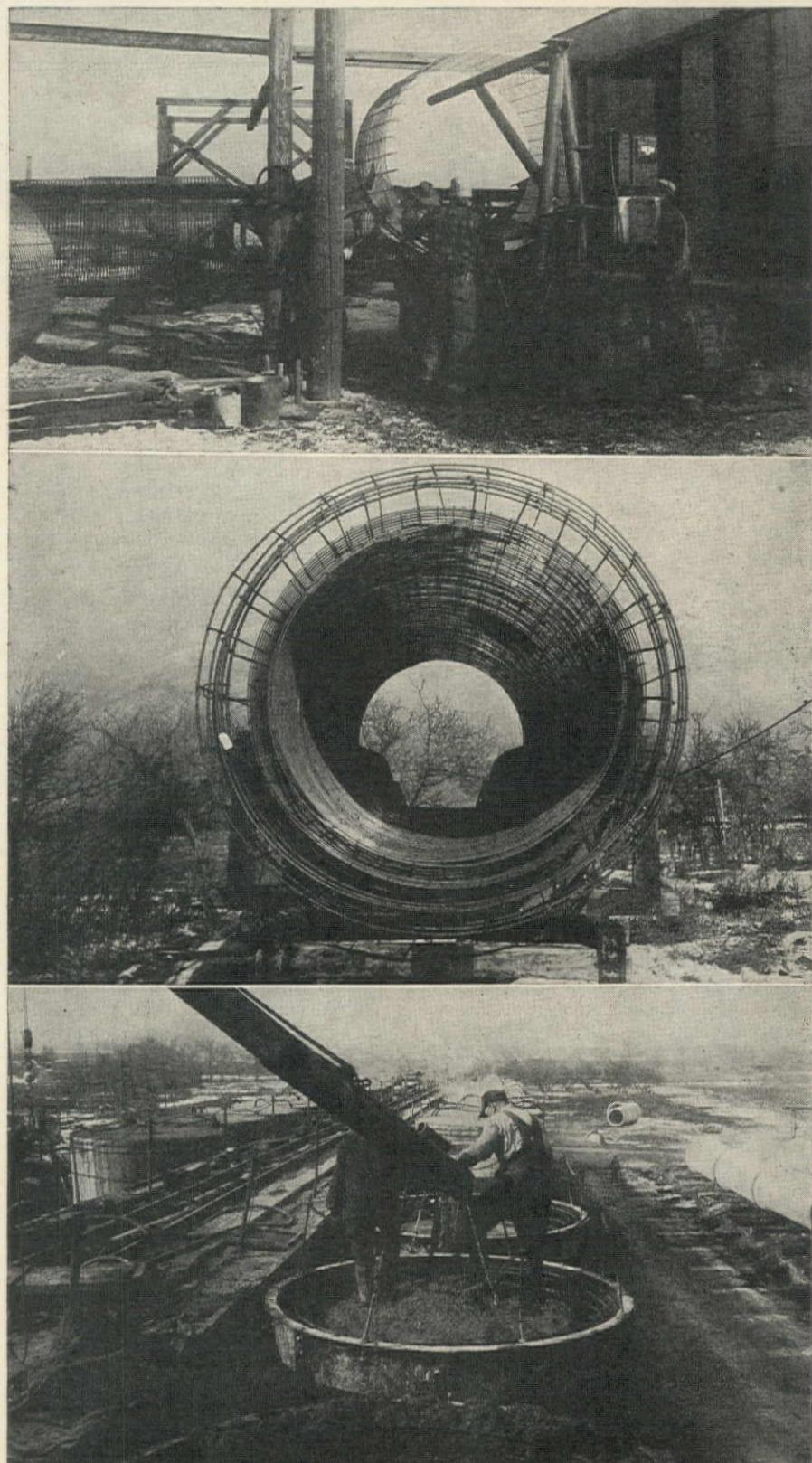
The hydraulic turbine will be of the horizontal-shaft, overhung-runner, Francis-type with spiral casing. The turbine will have a capacity of 1,000 hp. at full gate opening when operating at 500 r.p.m. under a net effective head of 145 ft. In order to meet the required conditions of operation at this location, the turbine has been designed to operate at best efficiency under a net effective head of 150 ft., with a discharge of 60 sec. ft. The best efficiency when operating under an effective head of 150 ft. will be approximately 86 per cent, and the power output for this condition will be about 885 hp.

The pump will be of the horizontal, double-suction, centrifugal type for direct connection through a solid coupling to a hydraulic turbine. The pump will have a capacity of 65 sec. ft. when operating under a total pumping head of 103 ft., including a static suction lift of about 8 ft. Pumping efficiency for the above

condition will be approximately 86 per cent, and the power input will be about 883 hp. The required operating speed for the pump will be 500 r.p.m. in order to synchronize the operation of the pump and turbine.

In order to supply water by bypassing the turbine, to facilitate operation, and

CARL B. WARREN has own pipe casting yard for manufacturing pipe used on the Salt Lake Aqueduct, Jordan Narrows siphon and other elements of the Provo River Project. Reinforcing cage is fabricated by rolling in sections from wire mesh mats, top; completed cage for 69-in. pipe used in siphon, center; pouring concrete, bottom.



to protect the turbine, a 30-in. steel body flanged gate valve will be installed between the penstock pipe and the turbine's scroll-case. The valve will be of the single-wedge disc, outside screw and yoke type, with chain wheel. The static head under which the valve will operate will be 300 ft., and the valve will be equipped with a 4-in., 150-lb. steel flanged valve bypass. This 30-in. gate valve will permit the full capacity (65 sec. ft.) of the penstock line to bypass the turbine.

The bypass from the penstock pipe is divided into two lines with one leading to the turbine discharge line and the other leading to the pump discharge line. The flow of water to the respective lines will be controlled by two manually operated valves with energy absorbers. An additional 14-in. bypass line of 35-sec. ft. capacity is provided in the pumping plant between the turbine discharge line and the pump discharge line. Discharge through the 14-in. bypass line is controlled by a 14-in. gate valve, and this bypass line is designed to operate during the normal operation of the turbine and pump.

Typical operation

A typical operation for the plant with the turbine operating at the point of maximum efficiency would consist of the following: Sixty second feet of water would be discharged through the penstock pipes to the turbine, which would generate approximately 885 hp.; this power would operate the pump, which would lift 65 sec. ft. of water from the Jordan River 103 ft. in elevation to the North Branch Canal. For this condition of operation, at least 20 sec. ft. of the 60 sec. ft. of water which operates the turbine must be bypassed through the 14-in. bypass to the North Branch Canal. Accordingly, for the above operation there would be 85 sec. ft. flowing to the North Canal and 40 sec. ft. to the second canal. The above example is the normal operating condition for which this plant is designed.

In order to insure the correct operation of this rather complicated system, Venturi tubes will be placed in tangent sections of both 48-in. steel discharge lines at a distance of approximately 100 ft. from the pumping plant. The Venturi tubes will be connected by piping to flow meters located on the pumping plant walls.

Other auxiliaries will include the following:

The installation of a 24-in., 125-lb. flanged check valve of the non-slam, tilting disc type in the pump discharge line immediately downstream from the pump.

The installation of a water jet primer of the fixed nozzle type for priming of the pump. The minimum capacity of this primer will be 20 cu. ft. of air per minute at a lift of 15 ft. of water when the inlet water pressure is 120 lb. per sq. in.

The installation of an eight-ton, hand-operated, overhead traveling crane together with track rails and other necessary appurtenant parts.

In order to unwater the pump intake and the siphon and discharge lines, and to provide drainage for the pumping plant, a reinforced concrete sump 37 ft. deep will be constructed at a location approximately 25 ft. northwest of the pumping plant. A valve house will be constructed over this 9 x 7½-ft. sump and will house the blowoff valves from the siphons and a deep well turbine-type pump. The pump will be direct-connected to a vertical hollow shaft induction motor and will have a minimum capacity of 600 gal. per min. when operating against the 30-ft. pumping head required to unwater the sump at this location. Automatic float switch control as well as manual control will be provided for the pump.

As a protection to the turbine and pumps, trashracks will be provided at the intake structure to the siphons and at the intake to the 65-sec. ft. pump sump, the rack at the pump sump will be placed on a slope of 15 deg. from the vertical, and the rack at the intake structure will be placed on a slope of 26 deg. from the vertical. Both racks will have about 1-in. clear openings.

Wasteway

As an overall protection to the siphons, pumping plant, continental railroad, canals, and other features in this locality, the designs for the siphons include a full capacity (350 sec. ft.) siphonic wasteway located approximately 30 ft. upstream from the inlet structure to the siphons. The wasteway will convey water rejected at the inlet structure to the Jordan River, which is about 300 ft. lower in elevation than the inlet structure to the siphon. The wasteway will consist of a reinforced concrete chute constructed on the steep sidehill immediately north of the inlet structure, a reinforced concrete stilling pool, and earth channel constructed from the stilling pool to the river.

Construction

Construction work on schedule No. 1, which includes the construction of the inlet structure to the siphon and the manufacturing and laying of low head concrete pipe and other necessary items of work for the first 1,800 ft. of the two siphons, was completed in June, 1947. Carl B. Warren was the contractor for this schedule.

Bids for schedule No. 2, which includes the construction of the pumping plant and discharge lines and all remaining work to be performed on the siphons, were opened July 10, 1947. Carl B. Warren submitted the lowest of three bids received (\$549,299.40) and was awarded the contract for the construction of the schedule. The contractor planned to start full operations in late September upon the receipt of reinforcement steel and other structure materials.

Other concerns with whom contracts have been executed for the furnishing of major items of equipment and material are as follows: 65-sec. ft. pump, Worthington Pump and Machinery Co.; Turbine, James Leffel Co.; Gate valves and

butterfly valves, Chapman Valve Co.; Deep-well turbine pump, Pump and Equipment Co.; Jet pump primer, Schutte and Koerting; Bypass valves with energy absorbers, Pacific Coast Engineering Co.

Bids were opened on Aug. 28, 1947, for the fabrication and furnishing of steel pipes for the siphons and discharge lines. The low bid was submitted by the Provo Foundry and Machine Co., Provo, Utah.

Organization

As part of the Provo River Project, the Jordan Narrows Siphons are being constructed by the Bureau of Reclamation; Michael W. Straus is Commissioner and Walker R. Young is Chief Engineer. Designs and specifications for the Jordan Narrows Siphons were prepared by the Denver office of the Bureau of Reclamation. The original negotiations and planning of the Provo River Project were carried out under the direct supervision of E. O. Larson, who is now Regional Director of Region IV. Construction work is under the direction of L. R. Dunkley, Project Engineer for the Provo River Project. R. W. Jennings is Resident Engineer on project construction, and C. J. Bargeron is Office Engineer. R. C. Borden is Field Engineer on the construction of the Jordan Narrows Siphons.

Construction operations for Carl B. Warren, contractor, are being directed by M. S. Ross, General Superintendent.

Revised Fir Plywood Standard Now in Effect

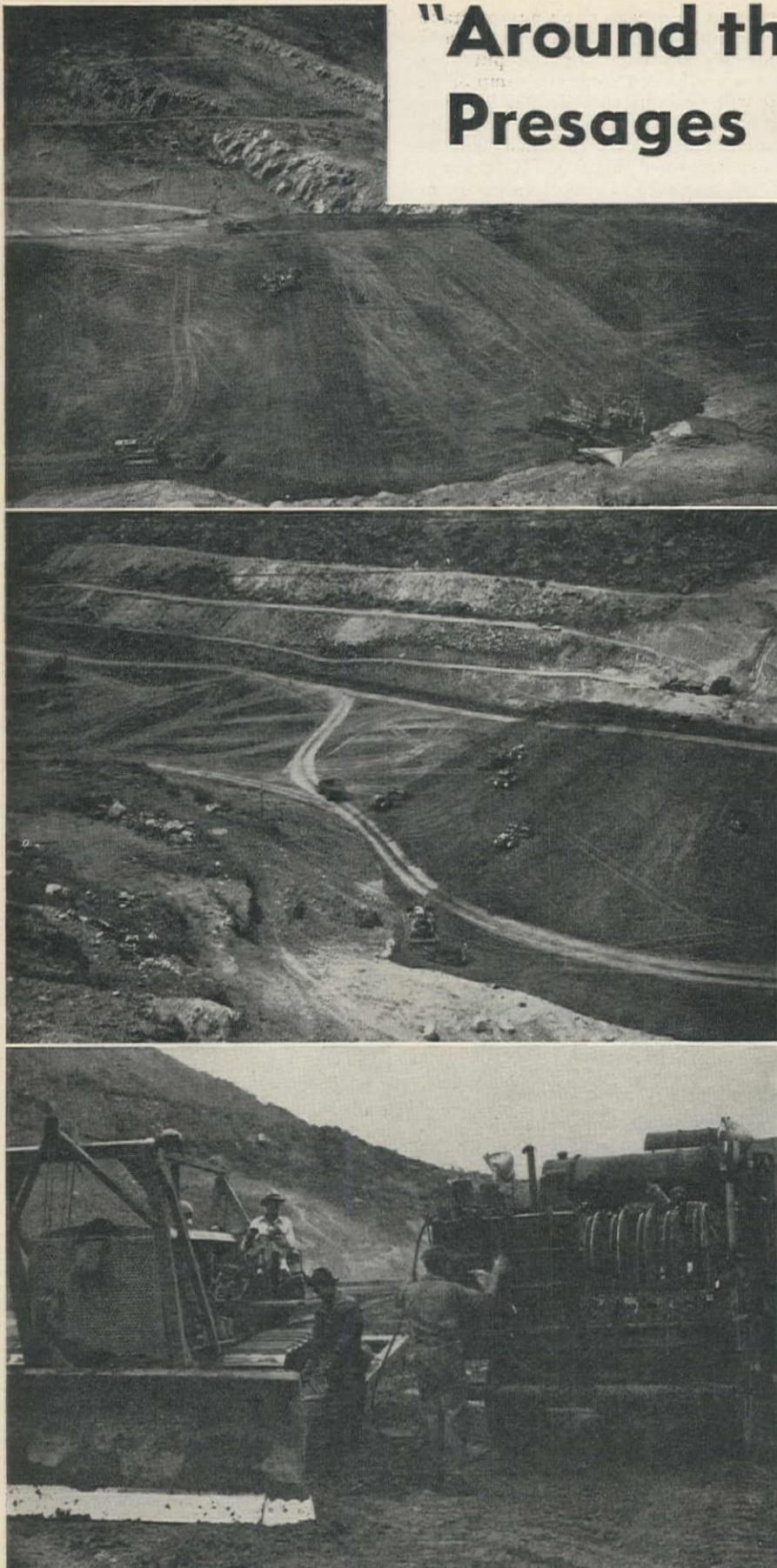
NEW REVISION of the Douglas Fir Plywood (Sixth Edition) Commercial Standard CS45-45 is in effect as of September 15, 1947, according to J. W. Medley, Commodity Standards Division of the U. S. Department of Commerce.

The new standard was circulated among manufacturers, distributors and users, and signed acceptances, estimated to represent a satisfactory majority, were received. First standard went into effect in 1932 and the rules were designed for guidance of the Douglas fir plywood industry. General adoption and use of the rules is intended to facilitate procurement of the proper grade of material and the proper type as to moisture resistance for its varied uses, as well as providing a better understanding between buyer and seller.

The 1932 grading rules were accepted by the trade and promulgated as Douglas Fir Plywood, Commercial Standard CS45-33. The standard was revised in 1936, 1938, 1940, 1942, and 1945. Newest revision is effective for new production from September 15, 1947.

The rules cover five grades of interior type and seven grades of exterior type Douglas fir plywood; a laminated board for paneling, sheathing, concrete forms, cabinet work, and other structural and industrial uses. Grade specifications for door panels, tests, standard sizes, size tolerances, reinspection rules, and nomenclature and definitions are included.

"Around the Clock" Work Presages Fulfillment of



EARTHWORK on auxiliary dams which will form a portion of the east wall of Horsetooth Reservoir. Top, placing and rolling fill for Dixon Canyon Dam by Rhoades Bros.-Shofner; about 3,000,000 cu. yd. of embankment is involved in this structure. Center, embankment work at Spring Canyon Dam under construction by Hinman Bros., and involving 2,210,000 cu. yd. of fill. Bottom, lubrication of equipment by portable oiling machinery during shift change at Soldier Canyon Dam, part of the Gafe-Callahan contract.

AROUND the clock," is the order of work for Gafe-Callahan on construction at Horsetooth Dam just north of Denver, Colorado. Everyone is busy on this \$5,111,877 contract that must be finished by June, 1949. Affiliated with Gafe-Callahan is Gunther and Shirley, and W. K. McIllyar, all of Fort Collins, Colo. The general superintendent on the job is Fred Brandt and the construction engineer for the Bureau of Reclamation is R. B. Ward.

Horsetooth Reservoir is on the East Slope of the Continental Divide and is the last large basin to receive the Colorado River waters diverted through the Rocky Mountains by the Alva B. Adams tunnel and other works of the Bureau of Reclamation's Colorado-Big Thompson project. The aggregate contract cost for construction of this off-stream storage reservoir is \$9,431,304. The eastern wall of this six and one-half mile long basin is a rock escarpment rising high above the valley and pierced at only three points by canyons. The west wall, which is about $\frac{1}{2}$ to $\frac{3}{4}$ mi. from the eastern rim, is the naturally rising slope of the Rocky Mountain range. Closing off the downstream end of the reservoir to the north is the Horsetooth Dam, an earthfill structure 125 ft. high, 1,600 ft. long, and requiring 1,850,000 cu. yd. of embankment. Evidences of a minor fault in the foundation were discovered in the initial exploratory work but to date excavation has not exposed the fault. No particular difficulties are anticipated from this source. The red Lukins shale which forms the foundation for the outlet works through the dam is an exceedingly soft rock that slakes in air. It is easily eroded.

Outlet works

The outlet works now under construction have an invert elevation 147.0 ft. below the crest of the dam. The location is roughly normal to the axis and at the mid point of the earth dam centerline. A trashrack structure at the upper end consists of heavy, reinforced concrete beams and struts supporting steel trashrack bars. About 354 ft. downstream is the gate chamber housing two 5 x 5 ft. high pressure, hydraulically operated, vertical slide gates. The concrete conduit connecting the trash-rack structure with the gate chamber is circular in cross section, 8 $\frac{1}{2}$ ft. in diameter, 34-in. wall thickness, and was poured in 27-ft. lengths with a 3-ft. gap left between each section. After all shrinkage had been taken up on the 27-ft. lengths the gaps between them were poured with concrete containing a non-shrinking admixture. Bid price on this concrete work was \$32.00 per cu. yd. with the Bureau furnishing the cement. Five cut-off col-

at Horsetooth Reservoir Contract Deadline in '49

Construction is proceeding rapidly on Horsetooth, Soldier Canyon, Dixon, and Spring Canyon Dams, earthfill structures which form main Colorado-Big Thompson distributing reservoir—Because East slope farmers should enjoy \$11,000,000 annual increase in production with the additional irrigation water, time element is vital

By A. E. NIEDERHOFF

Civil Engineer
Inyokern, Calif.

lars around this pipe are placed at 35-ft. centers upstream from the gate chamber.

High early strengths were obtained from this concrete by holding rigidly to a water-cement ratio of 0.53 by weight. An air entraining agent known as Darex was used to improve durability of the concrete, according to Bureau engineers. It was added in the amount of 0.68 lb. per cu. yd. of concrete. Seven day strengths of 6 x 12-in. cylinders averaged 2,700 lb. per sq. in.

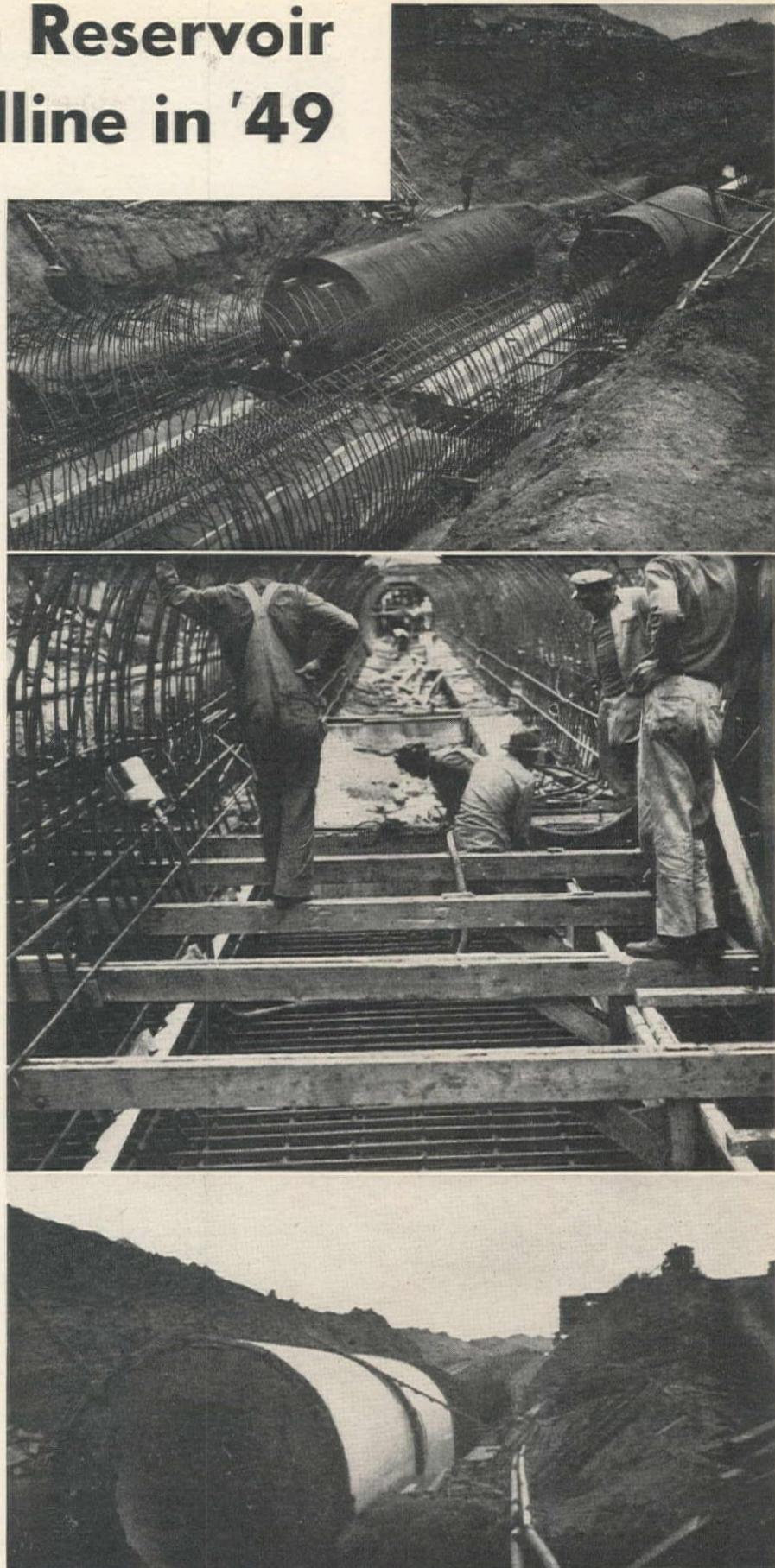
Aggregates were furnished under a subcontract by Millay and McBride from a pit located approximately 3½ mi. north of the site in the Cache la Poudre River bed. Sand consisted of hard, dense, uncoated particles free from shale, coal, clay lumps or other deleterious substances. The gradation conformed to the table given below:

TABLE I

Sieve No. Sand Retained, Cumulative Per Cent by Weight

4 (3/16 in.)	0 to 5
8	10 to 20
16	20 to 40
30	40 to 70
50	70 to 85
100	92 to 98
200	97 to 100

Coarse aggregates having a specific gravity of more than 2.60 were stock piled in two nominal sizes, $\frac{3}{4}$ and $1\frac{1}{2}$ in. Because of exposure of concrete structures to freezing weather it was necessary to prescribe that hard, dense, durable and uncoated fragments of rock be furnished. Tests were made frequently to ascertain that the loss in the Los Angeles rattler test did not exceed ten per cent by weight at one hundred revolutions. Sodium-sulphate or accelerated freezing and thawing tests were made and if the loss after five cycles was more than ten per cent by weight the material was rejected.



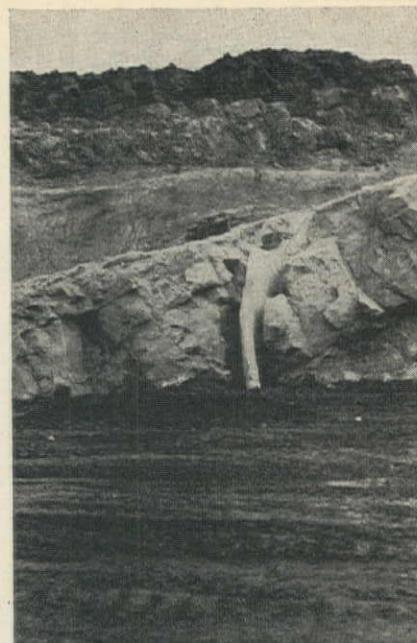
OUTLET WORKS at Horsetooth Dam. The upper 354 ft. consists of a circular conduit 8 ft. 6 in. in diameter with a wall thickness of 24 in., a section of which is illustrated in the lower photo. At a gate chamber near the axis of the dam, the cross-section changes to two 72-in. steel pipes carried in a double barreled horseshoe-shaped conduit, shown under construction in the two upper photos. Invert is poured first, after which steel forms are placed to receive concrete from crane-placed buckets.

Concrete work

Cement as supplied by the Bureau is a special grind of modified type. The contractor provided the batching plant where all material was accurately weighed in the proportions determined by the engineers.

From the batching and mixing plant the concrete was carried in two bottom dump buckets holding $2\frac{1}{2}$ cu. yd. each on a flat bed truck to the point where it was to be placed in a form. In the case of the upstream conduit for the outlet works the inside forms were steel plate and the outside forms were made of wood. Internal vibrators were used to reduce voids in the concrete. The invert was poured first and the remainder of the pipe was cast in place as a second pour. Cleaning of laitance from the top of the first lift of concrete placed in the invert was done by a combined air and water jet. An Ingersoll-Rand Model K-500 compressor furnished all air needed for jackhammers and cleaning operations. Since the cut below the natural ground surface for the trench to take the conduit was about fifty feet deep, a crane was used to lower the buckets from the trucks to the forms. Concrete finishing and curing provided an exceptionally smooth surface inside the conduit for the passage of water.

Below the gate chamber the water is carried in two steel pipes each six feet in diameter that are mounted within a double barreled concrete tube. A walkway alongside the pipes from the valve house to the gate chamber is provided within the concrete conduit. Pipe stiffeners and supports are placed at 20-ft. centers. Here again the contractor elected to use steel inner forms and wood outer forms. Curing of concrete was done with wet burlap bags. Shrinkage was taken care of in the same manner as the upstream conduit by leaving a three



REINFORCED CONCRETE cutoff wall in the left abutment of Soldier Canyon Dam. Mechanical tamping of embankment was allowed around cutoff walls because it was inaccessible to the sheepfoot roller.

foot gap between sections of concrete pipe for later pouring. Because of the extra forming in this section the contract price per cubic yard of concrete was \$33.00 with the Bureau furnishing the cement.

Other features

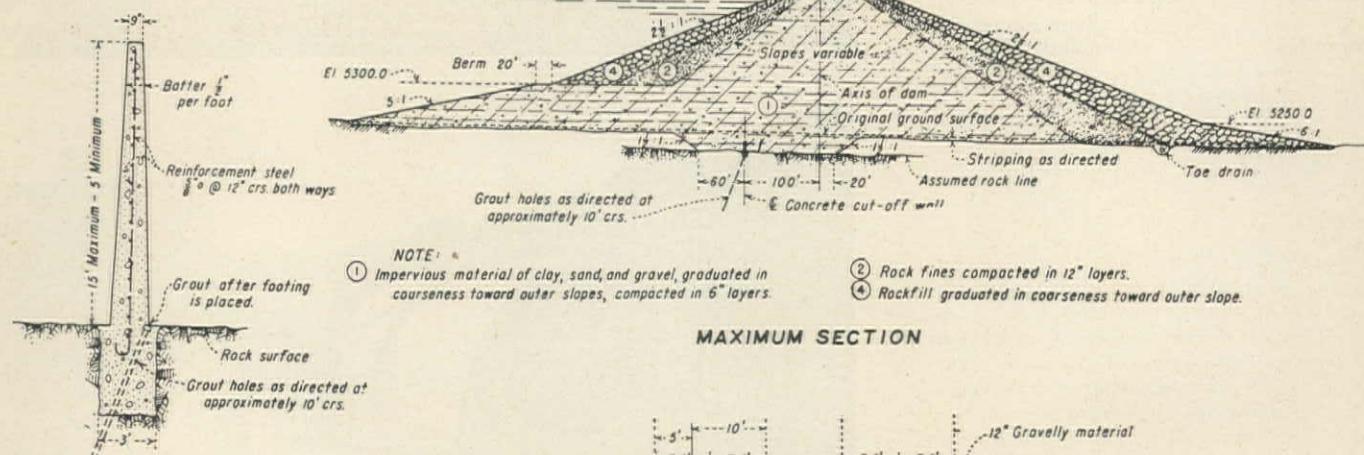
At the discharge end of each steel pipe is mounted a 72-in. hollow jet valve controlled by machinery mounted imme-

CROSS SECTION of Dixon Dam and concrete cutoff wall. Cross section of Spring Canyon Dam is identical except for height.

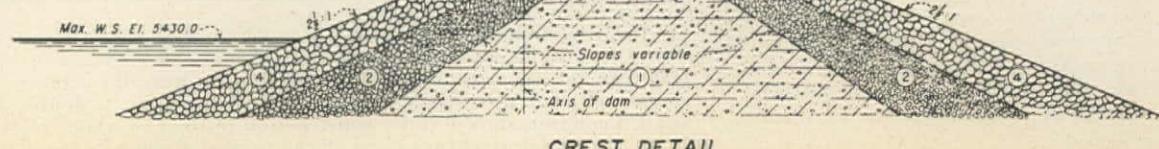
diately above in a valve house. The hydraulic coefficient of discharge for the outlet works, including losses at the trashrack structure, transitions, friction in 354 ft. of concrete conduit, losses through the gate chamber, friction in two steel pipes each 512 ft. long and losses through two 72-in. hollow jet valves, has been computed at 0.475.

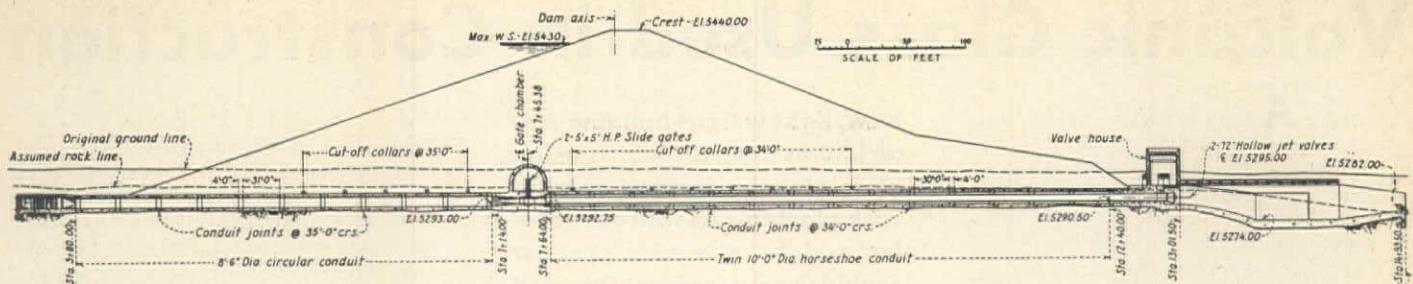
In addition to the Horsetooth Dam the contract price also includes an earth dam and outlet works at Soldier Canyon and a "fuse plug" known as Satanka Dike. This last is an earthfill structure located in a natural saddle in the ground surface slightly to the northwest of the main dam. The crest of Satanka Dike is at elevation 5436, just four feet below the crest of Horsetooth Dam. It is anticipated that if an emergency caused by faulty reservoir operation should occur, the water will flow over this 15-ft. high, rock paved structure and discharge into the Cache la Poudre River a mile or so downstream from the main dam. If the discharge is prolonged over a period, erosion of the 275-ft. long dike will take place, giving ample floodway for the runoff from the contributory drainage area of 10.5 sq. mi. The crest width of the dike is 25 ft., upstream slope one on three, downstream slope one on two, and it is paved with rock riprap three feet thick on the slope. Millay and McBride are the subcontractors furnishing the stone facing on this and other dams constructed under the prime contractor.

The driving of the tunnel for the outlet works for Soldier Canyon Dam was described in the August, 1947, issue of *Western Construction News*. Briefly, this 1,200-ft. bore was driven at a rate of 1,000 ft. in forty days. The tunnel has been lined with reinforced concrete and at the upper end is 5 ft., 8 in. in diameter with wall thickness of 18 in. Finishing of the concrete inside this tunnel is close



CONCRETE CUT-OFF WALL





to perfection which should improve the discharge characteristics of this outlet works.

Soldier Canyon Dam

Soldier Canyon Dam, which is placed as a plug in a notch in the east wall hogback, is 205 ft. high, 1,424 ft. long and contains 3,272,000 cu. yd. of embankment. Borrow material for the impervious section of this dam comes from the floor of the reservoir and consists of a well-graded mixture of sand and clay. In placing this material the contractor makes excellent use of a fleet of bottom-dump Euclid trucks holding thirteen cu. yd.

The trucks are loaded by gasoline engine driven shovels in the borrow pits. The trip from the pit to the dam, a distance of $\frac{1}{4}$ mi., is made at a rate of 30 m.p.h. Diesel-driven tractors are used to pull a Bureau designed sheepfoot roller over the new fill to compact it to specified density. The character of the fill is such that this compaction is achieved by twelve trips of the roller over each six-inch layer when the material has its optimum moisture content. Adjoining the concrete cutoff wall in the dam foundation and at other selected spots compaction was achieved with mechanical tampers.

In addition to the fleet of Euclid trucks the contractor also made use of LeTourneau scrapers. These fast moving machines had to be assisted by tractors pushing and Tournapulls pulling in order to pick up their load in the borrow pit. Equipment of every description is being utilized in this dirt moving job to "high-ball" it through in record time.

Dixon and Spring Canyon Dams

The \$4,319,427 contract for construction of the two other earthfill dams necessary to close natural drainage gaps in the east wall of this reservoir is a joint venture of Hinman Bros. Construction Company, and Rhoades Brothers and Shofner, all of Fort Collins, Colorado.

Rhoades Brothers is taking the Dixon Canyon Dam involving 3,000,000 cu. yd. of embankment. The dam is 220 ft. high, 1,200 ft. long, has a crest width of 40 ft., and side slopes of 1 on $2\frac{1}{2}$. Impervious core of dam is a mixture of red sandy clay scooped up in the basin by power shovels and transported to the embankment by end dump Euclids. The contractor also makes use of several Tournapulls. A ten foot thick layer of rock fines is placed on the side slopes of the impervious core and on the outside of this is another thick shell consisting of

PROFILE of outlet works through Horse-tooth Dam showing trash rack structure at intake end and stilling basin at outlet end. Hollow jet valves at lower end of the 72-in. outlet tubes will control discharge flow.

rock graduated in coarseness toward the outer slope.

The purpose of these pervious zones is to provide stability and prevent erosion which might result from relatively fast fluctuation in the reservoir level or by wind-generated waves. Rock fines are specified as rock fragments of which not more than twenty per cent by weight will pass a screen having $\frac{1}{4}$ -in. square openings, and the largest rock does not exceed 8 inches in maximum dimension. This material was placed in twelve inch horizontal layers and compacted by ten trips of a sheepfoot roller. The outside shell is free draining rock fill, material for which it is intended to quarry outside the reservoir area.

Spring Canyon Dam, 1,150 ft. long, at the extreme south end of the reservoir, is being built by Hinman Brothers. This embankment has the same cross section as the Dixon Dam but involves only 2,210,000 cu. yd. of material and is 205 ft. high. Equipment and method of construction is similar to that employed on the Dixon Dam.

One other contract has recently been let to Tunnel Constructors of Denver, Colorado. This contemplates excavation

and concrete lining for tunnels 2, 3, 4 and 5 in the Horsetooth Feeder Canal. The amount bid was \$1,838,352.75 with completion 600 days after August 6, 1947, the day when notice was given to proceed. Progress at this date has been largely confined to mobilizing men and equipment to do the job.

The Horsetooth reservoir will have a total storage capacity of 147,322 ac. ft., of which 137,000 ac. ft. is live storage. The cost per acre foot of live storage is therefore \$152.00. The decision to develop this relatively expensive reservoir was reached only after several alternatives had been investigated and proved not feasible or more expensive. Time is important on this project because each year that farmers in the Northern Colorado Conservancy District are without additional irrigation water from the West Slope they lose an annual increase of \$11,000,000 in farm production based on average 1939-1944 prices.

"We'll make it in good shape," said Cal Rickel, Assistant Superintendent, "if we can only get enough carpenters and equipment operators. Carpenters earn \$1.75 per hour and work forty-eight hours per week while equipment operators get paid according to the machine they operate. That crane operator gets \$2.00 per hour and works twelve hours per day. Time and a half is paid for all overtime after forty hours per week."

PRA Figures Show Increased Vehicle Registration During Last Six Years

MOTOR VEHICLE registrations throughout the United States for 1947 as estimated by the Public Roads Administration of the Federal Works Agency showed a marked increase of 7.8 per cent over U. S. registration for 1941. Only one of the 11 western states to show a decline was Montana with a total percentage decrease of 3.5. Automobile registration in that state dropped from 147,256 in 1941 to an estimated 131,000 in 1947. Truck and bus registration, however, increased, with a total of 690 buses estimated in 1947 against 350 in 1941 and 60,000 trucks against the 1941 registration of 51,126.

California, with the highest automobile registration of any state, has an estimated 2,955,000 automobiles in 1947, an increase of 13 per cent over the 2,614,106 registration in 1941. Bus registration has jumped over 50 per cent, with 6,700 buses estimated for this year against 4,263 for 1941. Truck registration is esti-

mated to be 498,000 from the 1941 total of 343,853.

Other western states and their overall motor vehicle totals include: Arizona, with an estimated 1947 total of 179,700 vehicles over a 1941 registration of 144,401; Colorado, 417,000 against 365,588 for 1941; Idaho, which has a registration of 187,300, topping the 1941 total of 365,588 by 9.5 per cent; Nevada, with a 20 per cent increase, 58,175 vehicles estimated over 48,160 in 1941; and New Mexico with an estimated 156,025 vehicles topping the 1941 total of 129,201.

Oregon has a percentage increase of 21.3 per cent over 1941, with a total of 520,700 vehicles estimated to be registered in the state as compared with 429,440 for 1941. Utah now has an estimated 185,400 vehicles as compared with 150,493 in 1941, while Washington figures are 704,675 against a 1941 total of 617,030. Wyoming noted a 9.9 per cent increase from 91,459 vehicles in 1941 to 100,500.

Volcanic Glass Used in Construction

ANOTHER NEW building material, trade-named "Dantore," has been developed by Dant & Russell, of St. Helens, Ore. This light weight building material, formed of little glass globules, is "popped" by intense heat from raw perlite ore, and seems well-suited, as one of its uses, to replace the sand in plaster. Dantore weighs only 12 lb. per cu. ft. as compared with sand's weight of 85 lb. per cu. ft. In the construction of an ordinary 7-room house, with 700 sq. yd. of plaster, the material would cut the weight of the plaster from 21,000 lb. to 7,000 lb., according to its promoters.

Besides this reduction in weight, it is claimed that plaster containing Dantore resists the checking and cracking of plaster common in houses which have settled even slightly. The little glass globules and the gypsum are more flexible in adjustment to the stresses of settling. In addition to its light weight and greater flexibility it also offers a considerable degree of insulation against heat, cold and noise.

Mining operation

The ore used in the manufacture of Dantore is extracted from a mountain of volcanic glass, located about 13 mi. south of Maupin in central Oregon. Work on the Lady Frances mine, believed to be the only underground perlite workings in the world, was begun in August, 1945, by Dant & Russell, one of

NEW PLASTER "Dantore" is being used by Fred Shearer & Sons, who are plastering the new million dollar savings and loan building in Portland, Ore. About 1,200 tons of weight have been eliminated in this building construction by use of the plaster.



New, light weight building material has been formed by using glass globules instead of sand with plaster—As well as reducing weight, the new product provides greater flexibility and better insulation

the West's largest lumber exporters and importers, and owners of vast timber holdings.

Into this mountain of obsidian, the makers of Dantore have run almost 2,000 ft. of tunnels. This was done primarily to determine the extent of the deposit, and now that it has been determined that the mountain contains approximately 20 years' supply of the glassy, non-metallic ore, the operation of the deposit will be converted to strip-mining.

The raw ore is crushed, ground and screened at the mine and shipped by rail to Dant & Russell's plant at St. Helens, where it is "popped" by 2,500 deg. F. furnace heat into the little glass globules which compose the finished product.

The material has already been used in a number of buildings in the Northwest, and was chosen for plastering Equitable Savings & Loan Association's new \$1,800,000 office building in Portland, Ore.

When finished, this building will be one of the most advanced examples of modern architecture and design in America. The use of Dantore in its construction enabled the structural engineers to eliminate approximately 1,200 tons of weight.

Ross B. Hammond Co. is the general contractor on the Equitable building, and Fred Shearer & Sons hold the subcontract for plastering.

Western Home Building Cost Still Increasing

CONSTRUCTION of homes in 12 key metropolitan areas of the Western region was 46 per cent higher than for 1939, the annual Investors Syndicate survey of housing construction reveals.

This increase was slightly less than the national average, which showed a 50 per cent rise. The Western region showed an increase of 102 per cent over the number of housing units built in 1945. Total new housing units built in the 12 key Western city areas was 45,681 in 1946, as compared with 22,582 in 1945.

Average cost per unit, meanwhile, has increased by 60 per cent, from about \$4,900 in 1939 to about \$8,000 in 1946.

City areas included in the survey, which was based on both government and private research studies, are: Denver, Colo.; Salt Lake City, Utah; Long Beach, Los Angeles, Sacramento, San Diego, San Francisco, Calif.; Ashland, Portland, Ore.; and Seattle, Spokane and Tacoma, Wash.

Best indication of the actual increases in housing construction costs, said Investors Syndicate, is a comparison of the cost per square foot. While some unit cost can be lowered somewhat by reducing areas and otherwise cutting corners, per square foot costs tell the actual price of living space. Whereas it cost about \$3.50 a square foot to build in 1939, in 1946 it was around \$6 to \$7—an increase of 70 to 100 per cent.

Air Bomb Becomes Effective Weapon to Halt Forest Fires

TRIGGERED by a proximity fuse, the air bomb may now be used as an effective weapon against forest fires. Charged with fire-fighting chemicals, the bombs would be dropped from Air Force bombers and exploded at tree-top level. E. F. Horton of the National Bureau of Standards has disclosed that already test bombings of man-made fires in Montana have been successfully completed. In these experiments, 165-gal. auxiliary fuel tanks of P-47s one-ton general purpose B-29 bombs were filled with water and dropped over the fires set by the U. S. Forest Service. The fuse exploded the tanks and bombs either extinguishing the flames or effectively soaking the surrounding area.

CONSTRUCTION DESIGN CHART

LXXXVIII... Unbalanced Tensile Reinforcing

THE ACCOMPANYING chart, based on a value of $n = 10$, is the last one of a related series based on the problem of unbalanced tensile reinforcing in concrete beams. The first one, based on a value of $n = 15$, appeared in the Nov., 1940, issue. The second, based on a value of $n = 12$, appeared in Oct., 1946. Thus a range is covered of ultimate strength of concrete from 2,000 p.s.i. to 3,000 p.s.i.

Since reinforced concrete slabs and walls are conventionally analyzed in elements of unit width, and that unit width as a beam, these charts are applicable to such cases. I believe the reader will quickly see that the use of such a chart gives more information in less time than the usual table of constants requiring two-way interpolation. As an example in the use of the accompanying

By JAMES R. GRIFFITH
Civil Engineer
Seattle, Washington

chart, let us assume the following conditions: It is desired to determine the necessary reinforcing in the walls of a concrete valve-pit. At the section in question, the effective depth to the reinforcing steel is $d = 4$ in. The total bending moment on a 12-in. width is $M = 35,000$ in. lb.

$$\begin{aligned} f'_c &= 3,000 \text{ p.s.i.} \\ n &= 10 \\ f_s &= 20,000 \text{ p.s.i.} \\ \text{then } K &= \frac{M}{b d^2} = \frac{35,000}{12 \times 4^2} = 182.5 \end{aligned}$$

The chart is solved by a single straight line intersecting all scales. The solution line, for the assumed conditions, must pass through a value of $K = 182.5$. While the allowable maximum unit stress in the concrete is

$f_c = 0.45 f'_c = 0.45 \times 3,000 = 1,500$ p.s.i. a solution line to this value would indicate a steel stress all out of reason. Therefore the steel stress is said to control.

A solution line has been drawn on the chart from the maximum allowable unit steel stress ($f_s = 20,000$ p.s.i.), through the value of $K = 182.5$. The following values will then be noted on the chart:

$$\begin{aligned} p &= 0.0103 \\ f_e &= 1,150 \text{ p.s.i.} \end{aligned}$$

We then have

$$A_s = p b d = 0.0103 \times 12 \times 4 = 0.494 \text{ sq. in.}$$

which is for the 12-in. unit width under consideration.

In order to check the above figures and show their comparative accuracy, I shall resort to the so-called method of transformed section.

$$\begin{aligned} \frac{b (kd)^2}{2} &= A_s n (d - kd) \\ \frac{12 (kd)^2}{2} &= 0.494 \times 10 (4 - kd) \end{aligned}$$

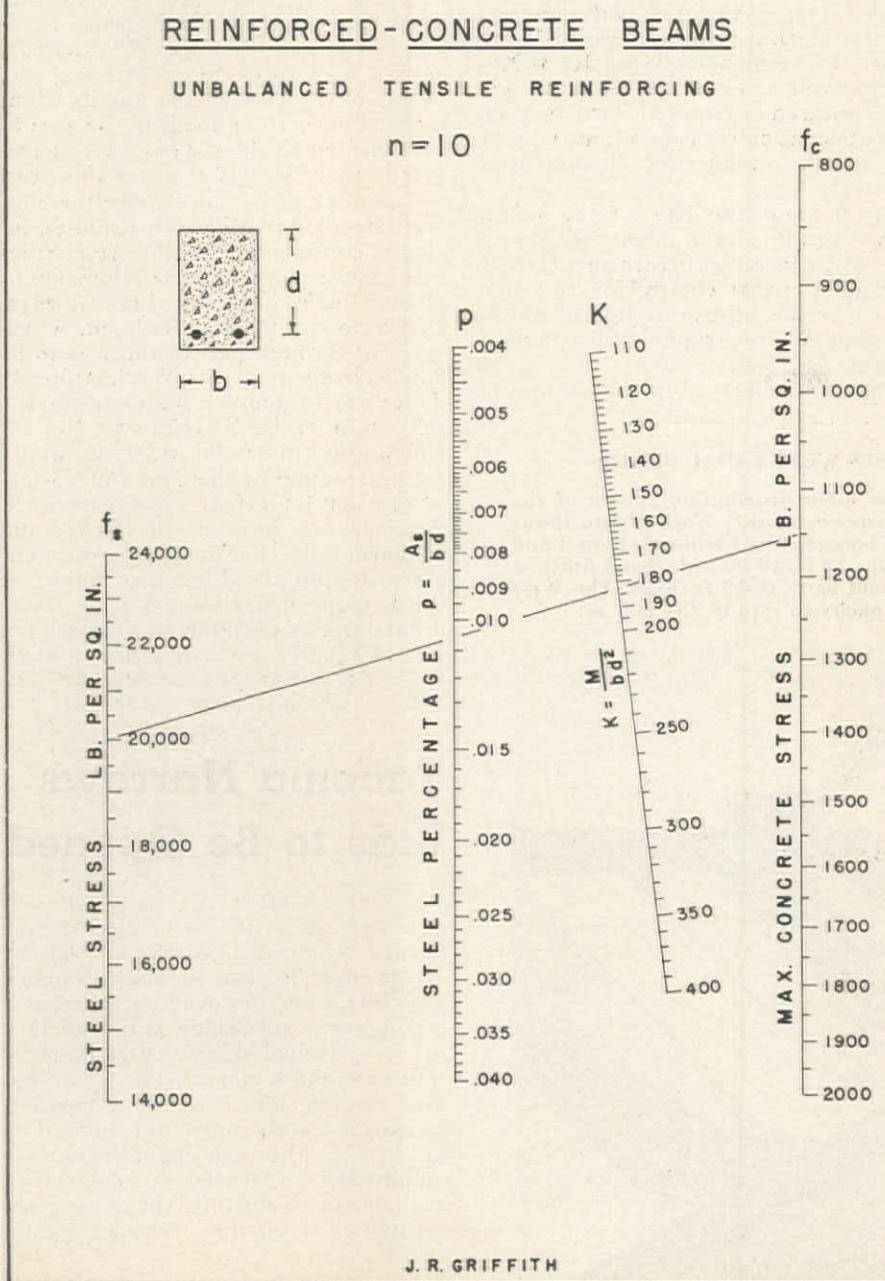
$$\text{or } kd = 1.453 \text{ in.}$$

$$\begin{aligned} \text{Then } f_e &= \frac{f_s/n}{(d - kd)} (kd) \\ f_e &= \frac{20,000/10}{2.547} (1.453) \\ &= 1,140 \text{ p.s.i.} \end{aligned}$$

I have found the use of this chart, and the related ones, very convenient when designing rectangular footings. In such cases the total depth of the footing is usually controlled by shear, and it is needless to include more longitudinal reinforcing than is required for bending. In such cases, I usually work with the total bending moment rather than a unit width.

Bridge Named for McCullough

COOS BAY BRIDGE, one of the well known Oregon Coast highway bridges designed and constructed under the direction of the late Conde B. McCullough, was dedicated to its builder in a ceremony held at Coos Bay, Ore., on Aug. 27. The proposal to rename and dedicate the cantilever span in honor of McCullough was originated by members of the Corvallis Engineers' Club of Corvallis, Ore., and was approved by the Oregon State Highway Commission. Principal feature of the dedication ceremony was the unveiling of a plaque, placed on the south approach, which designates the structure as the C. B. McCullough bridge.



NEWS OF WESTERN CONSTRUCTION

OCTOBER, 1947



Award Boysen Dam Contract To Morrison-Knudsen, Inc.

THE AWARD of a \$13,900,000 contract for construction of Boysen Dam on the Big Horn River in north-central Wyoming, the first reclamation job to go forward under the 1948 fiscal year program to expedite Missouri River Basin flood control, was announced in September.

The contract for building the main dam structure, and hydroelectric power plant and the relocation of a railroad, went to Morrison-Knudsen Co., Inc., of Boise, Idaho. The company's bid was more than \$2,500,000 lower than that of the next competitor for the job.

Terms call for the contractor to get work under way within 30 days after notice to proceed and to complete the job within a little over four years.

The huge, multi-purpose, earth fill structure, to be about 150 ft. high and 1,100 ft. long at the crest, will impound the Big Horn's waters at a point 18 mi. south of Thermopolis, Wyo. Its 31,000-ac. reservoir will hold back flood waters to be released as required for irrigation, hydroelectric power generation and provide a basin to reduce the silt content of the river.

At the toe of the dam is to be built a hydroelectric power plant with two 7,500-kw. generators to turn out urgently needed electrical energy for the area served by the Bureau of Reclamation's Colorado-Wyoming power distribution system.

This dam will be an important unit in

the chain of Reclamation and Corps of Engineers structures which will eventually turn the floods of the Missouri River system from destruction to the creation of economic wealth and stability under the approved Missouri Basin plan.

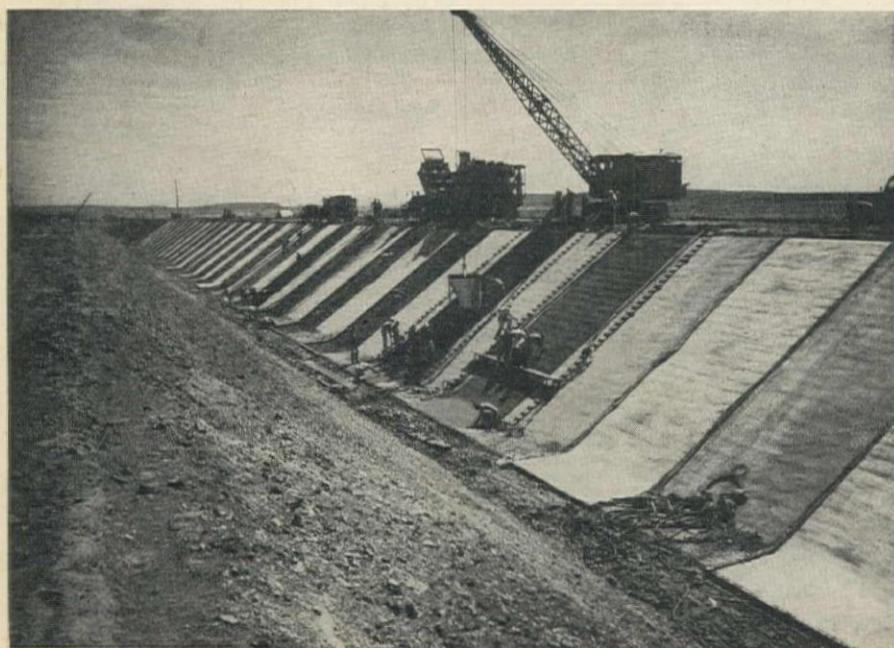
Boysen will serve in immediate coordination with two other reclamation dams, Moorhead on the Powder River and Mission on the Upper Yellowstone, as key structures for restraining the waters of the Yellowstone and its tributaries. Losses from floods in the area to be benefited by these dams have aggregated nearly \$1,000,000 so far this year.

The work to be done under the contract awarded to Morrison-Knudsen includes construction of the dam structure, power plant, and the relocation of about 14 miles of tracks of the Chicago, Burlington & Quincy Railroad, which now cut through part of the area to be flooded by the reservoir. Work is already under way by another contractor on the relocation of U. S. Highway No. 20, which also crosses the reservoir site.

Construction of the dam will go forward under immediate supervision of R. S. Lieurance, formerly of Denver and Colburn, Colo., Reclamation project engineer for Boysen. Lieurance, holder of the Legion of Merit and Purple Heart decorations as a Colonel of Engineers in World War II, was construction engineer at the Warren C. Austin Project, Altus, Oklahoma, prior to the war.

CONCRETE LINING OF COLUMBIA BASIN WEST CANAL BEGINS

CANAL LINING operations are under way on the main distribution system of the million-acre Columbia Basin Irrigation project near Soap Lake, Wash. Photo shows crews at work on a 2,000-ft. section of West Canal between Dry Coulee Siphons 1 and 2. Concrete is poured 4½ in. thick in alternate strips 13 ft. 10 in. wide, hand finished and coated with white curing compound. The canal bank is 40 ft. high. The West Canal will be 88 mi. long with a 5,100-sec. ft. capacity to supply 281,000 ac.



Tacoma Narrows Bids to Be Opened

TACOMA NARROWS BRIDGE construction bids are scheduled to be opened at Olympia, Wash., on Oct. 15, a year after the plans for the redesigned structure were approved by the Washington State Toll Bridge Authority. One of the principal delays in getting the structure under construction again has been the difficulty in securing commitments for the insurance to be placed on the bridge. Although engineers for the underwriters approved the new plans, available funds for this type of coverage are limited in any one insurance organization.

The new design for the Tacoma Nar-

rows bridge (*Western Construction News*, May, 1946) calls for a 4-lane structure with a 2,800-ft. central span and end spans of 1,100 ft. The towers will be 40 ft. higher than those of the original bridge which was destroyed by wind shortly after it was opened to traffic (*Western Construction News*, December, 1940). The bridge connects Tacoma with the Olympic Peninsula, spanning a portion of Puget Sound known as The Narrows.

Cost of the original structure was \$6,400,000 while the redesigned structure is estimated to cost \$8,500,000 not including the two main piers which remain from the first structure and will be used in the rebuilt bridge with some modification required for the wider structure. The design has been completed and construction will be carried out under the supervision of the Washington State Toll Bridge Authority of which Clarence B. Shain is chief engineer and Charles E. Andrew is principal consulting engineer. Dexter R. Smith is design engineer.

Utah's New Labor Law Tested by Contractors

THE NEW labor relations law enacted by the 1947 Utah legislature is being given its first tests by construction companies and the AFL International Union of Operating Engineers.

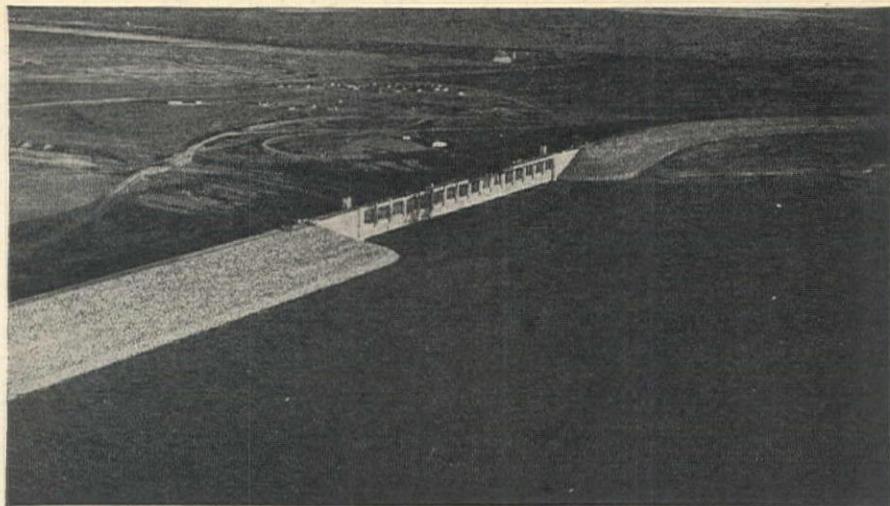
First case brought under the act was by the B. D. Palfreyman Construction Co. and the second was by the Wheelwright Construction Co.

The Palfreyman firm, contractor for the 36-mi. Mormon Trail Memorial highway from Henefer to Salt Lake valley, charged the union with calling a strike and setting up a picket line without first conducting a secret strike ballot as required by the new law. The State Industrial Commission (which is also the state labor relations board) found the union guilty of the alleged unfair labor practices and issued a cease and desist order.

By way of retaliation the union then filed a charge against the construction firm alleging violation of a depression law limiting the work week to 30 hours on all state-financed projects. The 30-hour week law was enacted in 1933 in response to the "share the work" psychology of that period but it has been a dead letter since the late thirties. The fact is that every contractor who has done any construction work for the state for the past seven or eight years has violated the 1933 law. A bill was introduced into the last legislature to repeal it but was lost in the shuffle between the houses.

The Wheelwright Construction Co. case, not yet decided, is based on the same violation—calling of a strike without authorization by secret ballot. In this instance the picket line was established and maintained by the Ogden Building Trades council rather than by the operating engineers alone.

The cases are virtually certain to go to the supreme court.



Expect Completion of John Martin Dam Erection by End of This Year

COMPLETION of John Martin Dam, Colorado's largest, seems certain this year as Morrison-Knudsen Co. workmen press final work on the project designed by the Corps of Engineers to check the often-rampant Arkansas River and combat spring floods. The dam is located 80 mi. below Pueblo, Colo.

Largely built a few years ago by a joint-venture group known as the Caddo Contractors, the structure was halted in 1943 as non-essential to the war effort and work was resumed only last year. M-K's job is completion of the 1,600-ft. long bridge structure and installation of 16 steel Taintor gates, weighing 78 tons each, through which flood waters will be released over the spillway in regulating the flow of the once-destructive stream.

The main structure of the dam is an earth embankment two and two-thirds miles long. Water was stored for the first time at the dam last year as the War Department engineers used federal authority to impound water at the project pending resolution of a Colorado-Kansas dispute which had previously delayed the use of the dam as an irrigation reservoir.

John H. Reed is project manager for the operation and Kenneth Gilbert is supervising project engineer at the dam for the War Department. The dam is under the jurisdiction of Col. Henry F. Hannis, district engineer at Albuquerque, N. Mex.

An airplane view of the nearly completed John Martin Dam is shown in the photo above.

Huge Bureau of Standards Computing Machine to Be Set Up in Los Angeles

PLANS HAVE been completed for the establishment of one of the newest units of the National Bureau of Standards—the Institute of Numerical Analysis—at the University of California at Los Angeles, according to an announcement by Dr. Edward U. Condon, Director of the Bureau.

One of the giant high-speed electronic computing machines, now under development by the Bureau of Standards, will be installed at the Institute when completed. These computers will solve problems in minutes that now take days to work out, and will solve in days problems that are now out of the reach of scientists. Design specifications call for high memory capacity and automatically sequenced mathematical operations from start to finish at speeds attainable only with electronic equipment.

The machines can conceivably revolutionize the field of applied mathematics. Of particular importance both

to the physical sciences and to technical industries will be the fact that the Institute will be able to set up a mathematical counterpart of an actual situation, which permits the situation then to be studied through relatively inexpensive calculating rather than costly experimentation. Great as has been the progress of the past century, the time has come when many problems of great importance, especially in hydrodynamics, aerodynamics, and meteorology, can only be handled by computers working at speeds measured in millionths of a second.

The Institute has two primary functions. The first is research in applied mathematics aimed at developing methods of analysis which will extend the use of the high-speed electronic computers. The second is to act as a service group for Western industries, research institutions, and government agencies. The service function will include not only the use of the machines for problem

solving but also assistance in the formulation of problems in applied mathematics of the more complex and novel types. Service operations are to be initiated immediately, using the latest types of commercially available computing equipment.

The decision to locate the Institute at the University of California at Los Angeles was made after a nation-wide survey by the National Bureau of Standards. Centers in the East and Middle West were considered as well as the Far West, but Los Angeles, it was decided, offered the widest range of possibilities for an Institute of Numerical Analysis. Concentration of aircraft industries and the presence of several major scientific institutions were critical in the choice of Los Angeles.

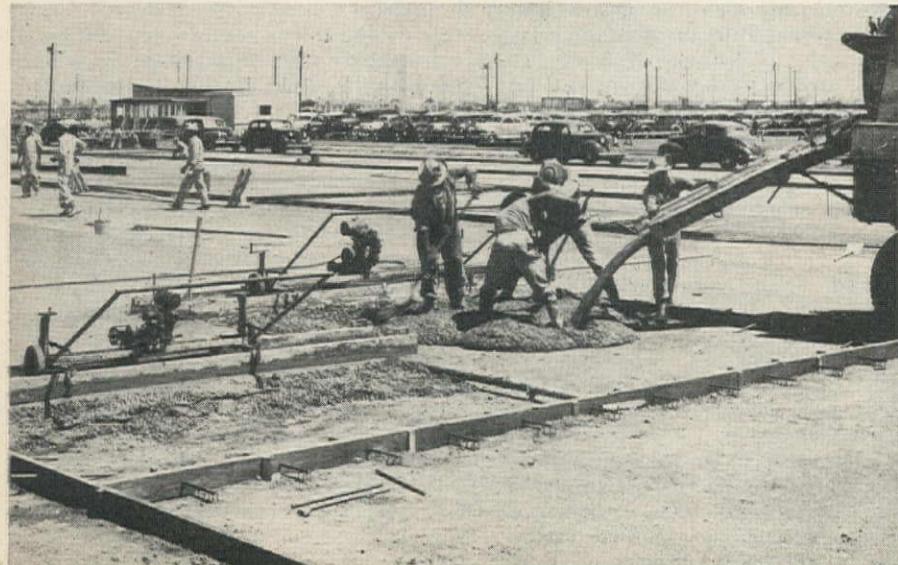
Joint Venturers Win Garrison Dam Contract

THREE TENNESSEE contractors submitted the low bid for construction of the first stage of Garrison dam on the Missouri River in North Dakota. A joint venture consisting of H. N. Rodgers and Sons, Forcum-James, and S. K. Jones Construction Co., all of Memphis, submitted bids of \$6,349,830 on Schedule A, and \$6,258,230 on Schedule B. Engineers' estimates were \$7,919,347 and \$7,727,427, respectively.

Eight bids were submitted, the second and third being slightly under the engineers' estimate. Second bidder was United Construction Co., Winona, Minn., offering \$7,592,087 and \$7,524,174. Mittry Bros., Los Angeles, were fifth in the list of bidders; a joint venture consisting of Morrison-Knudsen Co., Inc., Macco Corp., and Peter Kiewit Sons' Co., was sixth, and another consisting of Guy F. Atkinson Co., Bressi and Bevanda Construction Co., and A. Teichert & Son, Inc., was seventh.

PAVING AT NORTH AMERICAN PLANT SPEEDED BY RODDING MACHINE

AIRCRAFT APRON at Inglewood, Calif. poured by Burgess & Whitehead required 158,000 sq. ft. of concrete. Slabs were poured 25-ft. wide, using Whiteman screed stakes and rodding machine, which uniformly distributed aggregates throughout the slab. About 18,000 sq. ft. were poured per day and given a finish with gunny sacks.



Washington Abandons Cascade Tunnel Plans

CASCADE TUNNEL PLANS have been abandoned by the State of Washington following completion of a traffic survey of the route by the firm of Coverdale & Culpitts which indicated that construction of the 2.03-mi. tunnel could not be justified. The tunnel was first recommended by Ole Singstad, consulting engineer of New York (*Western Construction News*, March, 1947) as a means of alleviating dangerous driving conditions which exist during many months of the year on the Snoqualmie Pass route over the Cascade Mountains east of Seattle and Tacoma.

The recently completed traffic survey pointed out that although vehicles would use the proposed tunnel during winter months because of snow, ice, and slide conditions, much of the traffic through the summer months would use the more scenic ground level route. It was felt that year round traffic averages using a tunnel would not be sufficient to justify the \$22,000,000 estimated cost of constructing the tunnel. Gov. Mon C. Wallgren announced after receipt of the survey report that any further action on the proposed tunnel would be up to the state legislature.

Seek Engineer Papers For Sweden Conference

ENGINEERS throughout the United States have been requested to submit technical papers on a selected list of subjects concerned with dam construction for the Third International Congress on Large Dams, to be held in Stockholm, Sweden, in 1948 as an activity of the Third World Power Conference.

The call for papers was issued by the

International Commission on Large Dams in conjunction with a recent meeting of its Executive Committee, held at The Hague, for consideration of the agenda for the Stockholm conference.

Engineers are requested to submit their papers through the Chairman of the United States Committee of the International Commission, Michael W. Straus, Commissioner of Reclamation, Washington, D. C. They are urged to get them into the chairman's hands at the earliest possible time, but not later than December 1.

The executive committee listed the following subjects on which technical papers are desired:

1. Uplift on dams and uplift stresses.
2. Research instrumentation and results in measuring stresses and strains in concrete and earth dams.
3. Methods of controlling "piping" in earth dams.
4. Experience resulting from the use of special cements in large structures.

Upper Basin Meet Unable to Agree

THE RECENT exploratory meeting of the upper Colorado River Basin Committee, representing the states of Wyoming, Colorado, Utah, and New Mexico, has adjourned without definite action, but with hopes that a compact for division of the waters of the Colorado will be entered into by early spring. The meeting was called to study the division of seven and one-half million acre feet per year of Colorado River water allocated to the upper basin states, in response to the urgency created when the Secretary of the Interior indicated that no future projects will receive the department's approval until a compact is arrived at among the states.

The meeting, called by Governor Lester C. Hunt of Wyoming, was held Sept. 8 at Cheyenne. It was attended by the governor and the state engineer from each upper basin state and H. W. Bashore of Mitchell, Neb., water expert and federal representative, acting as permanent chairman of the commission.

Bashore queried assembled members concerning their readiness to begin consideration of a division of the water. Clifford H. Stone, Colorado water conservation board director, explained that Colorado preferred to wait for an engineer's report before proceeding further. J. R. Ritter of the hydrology division of the Bureau of Reclamation at Denver told commissioners that this report could not be ready until early next year. Thus, it appears that essential engineering data must be procured before a compact can be formulated.

The commission will meet again at Santa Fe, N. M., the first Monday in November. To hasten progress toward completion of a satisfactory compact meanwhile, each state pledged the employment of a full time engineer to work on the compact, except Wyoming whose budget will not support a full time engineer at the present time.

WASHINGTON NEWS

... for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—Exactly on the day that marked mid-September, Don McBride, the driving force of the National Reclamation Association, returned to his office in the Capital, after an absence since early in July. During the interval McBride traveled 18,000 mi., chiefly on the other side of the Mississippi River. He made his journey by rail, by plane, and by automobile. He visited every state west of the river with the single exception of Washington. He made the trip in order to get acquainted at first hand with the key people among those who conduct the business of irrigated agriculture in the reclamation empire. He found that the people most directly at interest were almost to a man entirely satisfied with the sober economy program of Congress, even if it sometimes did not give them all they wanted in the way of funds. Unlike the Bureau of Reclamation, the people who benefit by the policies made by Congress were not inclined to maneuver for more benefits by using trick and device. They want a revival of State's Rights; they want no Authorities, or any other federalized institutions which seize more of the rights and privileges of the localities and the regions.

At the National Water Conservation Conference, which McBride attended, the assembly passed resolutions asking that Congress reject any legislation designed to create regional or valley authorities "to the exclusion of effective participation by states and local interests"; and pledging the Conference to make a drive for legislation "to renounce the powers attributed to the Federal Government by the Supreme Court" in the recent so-called Tidelands case, which voided the claims of California to oil and other resources in submarine coastal lands. The Conference, as well as other sources in the reclamation West, clearly and definitely are heartily satisfied with the Pick-Sloan Plan for the development of the Missouri Valley, rather than the Missouri Valley Authority program which is so dear to the hearts of Mike Straus, Bill Warne, and other "liberal" members of the personnel of the Department of Interior.

Difference in emphasis

At the Denver conference of the ten states affected by the Missouri Basin program, Brig. Gen. Pick gave an outline of the "timetable" for the 1948 disbursement of \$100,000,000 in the Missouri Valley. Army Engineers place the emphasis on flood control, while the Interior people, naturally, bear down heavily on maximum power. In this effort to socialize, by means of the con-

trol of hydroelectric power, the Bureau and Department people have the hearty support of Sen. Murray of Montana. Presumably Sen. Murray has been touring the states of Montana, Colorado, Kansas, Missouri, Nebraska, and North and South Dakota, late in September and early in October, to hold "informal" discussions in the field about the Murray MVA bill. The program was to have the aid of Senators Pepper, Fla.; Taylor, Ida.; and Langer, N. Dak., to take part in this mission at various times and places.

McBride found the people in the reclamation West were not very much excited by the debate over the Taft-Hartley Bill, and other Labor legislation, or programs. But they were very deeply interested in the problem of a proper supply of labor for their own industry, farming and stockraising and all the various activities connected with irrigated lands. McBride found the people of the West had made up their minds that the great area beyond the River would be the bread-basket, the granary, and the over-all food provider for Europe and other parts of the world so desperately in need of relief from starvation. They are apparently gearing their thought and their potential activities to the accomplishment of this purpose.

West wants tax-revision

He found also that they want tax-revision. Apparently the urge that something be done about taxes is the strongest want in the Western mind. McBride found they are far less interested in revision in the upper levels than in the lower brackets. Apparently they think that if and when the taxpayers in the lower levels are relieved from some of their tax obligations far more funds will be freed for circulation than by any other suggested tax reform. They seem to be very much in favor of Congressman "Bud" Gearhart's proposed tax revision, the bill which would eliminate excise taxes and place the tax at the manufacturer's level. Gearhart's bill also would exempt millions of people at the lower level, and bring many elements now exempt from taxation into the tax-paying category. Gearhart, it may be remembered, points out that 60 per cent of the wealth of the country pays no taxes, while the burden is borne by the other 40 per cent.

McBride wishes this reporter to emphasize that the 16th annual convention of the National Reclamation Association at Phoenix on October 29, 30, and 31, will be even more than usually interesting. Both Interior Secretary Krug, and Agricultural Secretary An-

derson, will speak. So, also, probably, will Congressman Gearhart.

Congress' special session

The special session is denied at the White House, and is affirmed on the Hill. They tell you here, where they usually know, that we will go through a special session, to be called to meet in November when all the wandering Congressmen and Senators in Europe and Asia, traveling as committees or as solitary investigators, have returned to Washington, which is expected to have happened by the end of October. No one expects the Committee, which will shape the legislation to make the Marshall plan effective, will be able to get the job done until early next year. But in order that it be done it is good business to have Congress here.

During the interval there will be time for other things. It is generally assumed that in this period the House Public Works Committee will try to get the Dondero Bill, HR 3036, in shape to report to the House. This is the bill which is intended to amend the Flood Control Act so as to hand the control over Federal power at dams built by Army Engineers to the Secretary of War. At present the control is vested in the Secretary of Interior and his merry men of socialistic ideals. The House Public Works Committee also is expected to find that it favors the St. Lawrence seaway plan.

In the House Interstate and Foreign Commerce Committee they intend to re-open hearings on the Miller bills, HR 2972, and HR 2973. These would amend the Federal Power Act in such a way as to materially diminish the present authorities assumed by the Secretary of Interior and his self-constituted rulers of the realm. These are the bills, you will recall, which are designed to correct the present practice in the Department and its Bureau of Reclamation whereby the burden of financial exactions is placed upon the farmer of irrigated lands while the power created as a by-product of the thing he supports is regarded by the Bureau as his social contribution to the welfare of the nation. The same issue will come up in the Senate Public Lands Committee in hearings on the Rockwell-Butler bill, HR 2873, which amends the Reclamation Act of 1939, and alters the pay-back provisions of Federal power investments.

FPC on the spot

However, there is every likelihood that the most exciting and dramatic show in connection with any Committee hearing or report will be the happenings resulting from the explorations of the subcommittee of the House Ways and Means Committee, known as the subcommittee on Expenditures in Executive Departments. This subcommittee will summon the members of the Federal Power Commission, members of the FPC staff and personnel, some Members of Congress, and several newspaper columnists and syndicate editors.

The guns focused at the FPC really

are symptomatic of much exasperation which later may also be turned on other Bureaus and Departments. It is not news to the readers of this monthly Letter that Congress feels the Bureau of Reclamation has deliberately and openly violated the intent of Congress, as expressed in laws it has made. There are a number of other parts of the Administrative section of the Government which are similarly regarded by other parts of Congress. Taking their hint from FDR's action in trying D. Arthur E. Morgan for contumacy, which is another way of saying the official is insubordinate, Congress has given some thought to trying offending bureaucrats for contumacy, but the present plan is to haul the FPC on the carpet to explain why it conducted an organized propaganda campaign to influence legislation affecting the jurisdiction of the FPC. The charges are that the misinformation spread by certain columnists about bills before Congress was inspired by sources within the Commission. Congressman Miller of Connecticut, and Rizley of Oklahoma, have definitely charged that the FPC people tried to smear them. Miller, it will be recalled, is responsible for bills which would limit the FPC jurisdiction over private power dams on non-navigable streams, and over state line "slop-over" power sales. Rizley is co-sponsor of a bill which would curb FPC control of natural gas production-gathering. Both were unquestionably the targets for violent attacks. Rizley felt he had such definite proof that he succeeded in passing a bill in the House which would impeach all the members of the Federal Power Commission if the bill could be passed by the Senate.

But it is very doubtful whether Congress will go to the extreme measure of impeachment. Even if the Act were passed by both Houses, it is almost certain it would be vetoed by the President. The hearings, on the other hand, can be held without White House interference. If any employee of the Government should be so foolish as to decline to present himself for interrogation he would not only lose his job but would place himself in the position of being punished regardless of White House sentiment.

Money for public opinion

The hearings will rivet attention upon the questionable lobby practices of the Government Bureaus and Departments, and will undoubtedly reveal to the country at large a situation about which the people are almost ignorant. It is extremely doubtful whether the average taxpayer has any clear idea how his money is spent in huge sums by some Bureaus to influence public opinion. The subcommittee, headed by Rep. Harness of Indiana, has an investigating docket, on which there is listed conspicuously a series of charges against the Bureau of Reclamation, asserting that it put pressure on the grass roots in the West to force Congress to supply the increased appropriations which were not consonant with the economy program. At this time, as you know out there, the

Reclamation Bureau is engaged in lining up its case for large supplemental appropriations—not less than \$36,000,000—the plea for which the Bureau expects to present formally to Congress in January. Rep. Harness and his committee are watching present proceedings with lively interest.

The Interior subcommittee of the House Appropriations Committee, under the leadership of Chairman Jensen, of Iowa, has been touring the West by automobile since Sept. 15. Visits have been made to most of the Reclamation projects and to power installations, actual or potential, as well as to some other Interior projects. The word has filtered back to Washington that the committee has constantly been under the personal care of either Assistant Secretary of Interior Warne, or Commissioner of Reclamation Straus; and that wherever the committee has gone it has encountered suave and pleasant employees of the Department, together with their local friends from the grass roots, who have naturally poured out their convictions that the supplemental appropriations are urgently necessary. It also is reported that many public power groups have organized meetings during the period of the committee's junket, and that these meetings conveniently coincide with the visits of the committee, in relation to time and place. Major power project sites were found on the committee schedule as follows: Garrison, N. D., Sept. 20; Columbia Basin, Sept. 24-29; Grand Coulee, Sept. 30; Shasta Dam, Oct. 6; Central Valley, Oct. 10-14; Hoover Dam, Oct. 16-17; Lower Colorado Basin, Oct. 20.

Construction under way

We are told that the Army Engineers' report recommending a \$133,132,000 earth dam at Fort Randall, S. Dak., has been approved by Chief of Engineers Lieut. Gen. Wheeler, and construction will begin immediately. Army also is beginning 9,000 ft. of dikes on the Missouri for flood protection above Yankton, S. Dak. The Bureau of Reclamation is reported to be ready to start under contract on the new dam at Boysen, on the Big Horn River, in Wyoming; and it is also reported the Bureau is planning to break ground on six flood-control projects before winter. Acting Commissioner of Reclamation Kenneth Markwell recently announced that all regional offices have been instructed to proceed "full-speed ahead" on the work schedules laid down at the Reclamation Programming Conference in Salt Lake City, July 28 to Aug. 1. As previously reported this involves the \$195,000,000 job of construction work set as a goal for 1947-48, intended to initiate the long-range goal of \$1,500,000,000, to be fulfilled by 1954. Included are full and supplemental water supplies for 3,875,000 ac. of land, constituting 40,000 farms. Also, the installation of 2,250,000 kw. of hydroelectric power.

The U. S. Geological Survey Water Resources section reports that stream flow in the West increased generally,

relative to seasonal normal. Runoff in Arizona and New Mexico showed considerable improvement over preceding months, but the situation remains critical. Storage reserves for irrigation and power are reported generally much below a year ago.

Housing shortage

Congress will hold full-dress hearings on the housing shortage, beginning in October. The hearings are scheduled in Washington as well as in all areas from which complaints have been received. The investigation is being conducted by the Banking and Currency Committees of the House and the Senate, through subcommittees. The enquiry is to develop the effect of existing legislation of states and localities on the shortage and the high cost; how costs may be decreased; what may be done to bring building up to more modern levels to aid the program; what may be done to help financing of housing construction; what to do about slum clearance, and what the Federal Government may do; and what bearing the variation of real estate taxation has on the housing shortage.

It is reliably reported that 750,000 housing units will be completed this year. Veterans complain bitterly about poor structures, deficient heating, damp cellars, and a long list of troubles too numerous to repeat. Veterans Administration blames inspection lacks for most of the trouble. The VA has made 970,000 veterans' loans for housing, new and old, totaling over \$5,000,000,000.

It is reported that 600,000 workers have been employed on residential buildings. There is still shortage in cast iron soil pipe, as well as gypsum products, plumbing fixtures, plywood, millwork, nails, iron and steel pipe fittings, hardwood flooring, and sheet metal products. There is no decrease in the price of building materials in sight, according to the Department of Labor Building Materials Index. Prices are not expected to come down materially for several years.

Bases for Alaska

The Army has begun a program of military construction in Alaska upon which it will spend \$64,000,000, and the Navy has a similar Alaska program which will cost \$18,000,000. Most of the work is aimed at making some of the northern bases permanent and habitable for the military as well as for civilians. The Army handles mainland construction while the Navy is supervising the work on the Aleutians. Construction includes port facilities, storage facilities, air facilities, and housing. Major Army construction is programmed at Whittier, Fort Richardson, Ladd Field, and Mile 26.

The Navy has another program, involving \$40,000,000, for the building of 310 Naval armories, scattered around the United States. Forty per cent of the work has been allocated. Supervision is under direction of the Bureau of Yards and Docks.

Hungry Horse Dam Bids To Be Called in January

HUNGRY HORSE DAM construction bids will probably be called in January of next year, and a preliminary invitation to interested contractors for inspection of the site is expected to be issued during October by the Bureau of Reclamation. Bids will be opened on Oct. 15 for construction of a 1,100-ft. diversion tunnel at the site.

Construction of Hungry Horse dam, on the South Fork of the Flathead River about 30 mi. northwest of Kalispell, Mont., will create a 3,500,000-ac. ft. reservoir to increase the water supply for irrigation near Kalispell, to produce electric power, and to control floods. The dam is to be an arch-gravity structure, 520 ft. or more high, and about 2,130 ft. long at the crest. It will require placement of about 2,750,000 cu. yd. of concrete, and when completed will be the fifth highest dam in the world.

The construction schedule will call for completion of the dam and appurtenant works, including a 300,000-kw. power plant in 5 yr. Construction is expected to get under way some time in March, 1948. The diversion tunnel, for which bids will be opened Oct. 15, is to be a 36-ft. diameter tunnel of horseshoe section requiring the excavation of 77,000 cu. yd. of material.

Arc Welding Foundation Resumes Award Program

RESUMPTION of the James F. Lincoln Arc Welding Foundation-sponsored program featuring the Award and Scholarship plans has been announced. The current program, which distributes awards totaling \$6,750 to engineering students and their schools, is the first since the war.

The program contains two interdependent plans: the Award plan and the Scholarship plan. Under the first, engineering students of various engineering schools and colleges will submit papers on arc welded design and the use of welding in maintenance of machines and structures. Under the Scholarship plan, scholarships are to be allocated to the schools in which the three highest award recipients under the Award program are registered. A total of 77 awards amounting to \$5,000 are to be distributed. Seven scholarships of \$250 each are to be awarded to the various institutions.

Resident engineering undergraduate students registered in any school, college or university in the United States, offering a curriculum in any branch of engineering (including agricultural engineering) or architecture leading to a degree and cadets registered in the United States Military Academy, United States Naval Academy and Coast Guard Academy are eligible to submit papers.

A copy of the rules and conditions may be obtained by writing The James F. Lincoln Arc Welding Foundation, Cleveland 1, O.



LAST SECTION OF SHASTA PENSTOCKS LOWERED INTO PLACE

THE FINAL 42-ton section of the 15-ft. steel penstocks at Shasta Dam powerhouse was put in place in September by Eichleay Corp., of Pittsburgh, Penna., contractor, using a 70-ton stiffleg derrick. Only two penstocks were completed during the war, because construction of turbines and generator units was held up by the War Production Board. However, with return of two generators borrowed for Grand Coulee powerhouse, and start of manufacture of three others, Bureau is installing penstocks.

Jobs to Be Advertised by the USBR Include a Number of Large Projects

AMONG THE BID calls anticipated for the coming month, to be advertised by the Bureau of Reclamation, are a number of large projects which will be of wide interest to contractors all over the West. In the following tabulation, the dates given represent the date on which the Bureau will advertise the jobs, and not the date on which the bids must be returned.

On Oct. 13, invitations will be issued to bid on Heart Butte Dam, 18 mi. south of Glen Ullin, N. Dak., an earthfill 125 ft. high and 1,850 ft. long, also relocation of 7½ mi. of highway. On Oct. 15, invitations will be released on Heart Butte Government Camp, at the above damsite; relocation of 7½ mi. of road at Medicine Creek Dam, near Cam-

bridge, Nebr.; 30 mi. of 115-kv. transmission line from Coolidge Dam to Eloy, Ariz.; and earthwork and structures on a ditch crossing near Nyssa, Ore.

Anticipated on Oct. 17 are invitations to bid on earthwork and structures for the Saxon lateral of the Tucumcari, N. Mex., project; and erection of buildings at the Heart Butte Government Camp. On Oct. 24, bids to be advertised are: earthwork and structures for the Ozark laterals of the W. C. Austin project, near Altus, Okla.; a concrete pump-house near Boulder City, Nev.; and earthwork and structures on the Mud Springs Creek lateral system of the Deschutes project, near Madras, Ore.

Construction projects soon to be ad-

vertised, but on which definite dates have not yet been established include: laterals and structures on the Riverton project, near Pavillion, Wyo.; similar work on the Shoshone project, near Ralston, Wyo.; 14 mi. of transmission line in the vicinity of Yuma, Ariz., and 83 mi. of transmission line from Davis Dam to Parker Dam on the Colorado River; Medicine Creek Dam, an earthfill structure near Cambridge, Nebr., to be 107 ft. high and 3,600 ft. long; another 14.5-mi. section of the Friant-Kern Canal of the Central Valley Project, near Visalia, Calif.; and a pumping plant on the Klamath project, near Merrill, Ore.

Other coming jobs are: 6 mi. of high pressure steel pipe and two storage tanks near Boulder City, Nev.; two wastewater on the Boise project in Idaho, one near Caldwell, the other near Middleton; 13.6 mi. of the Delta-Mendota Canal, near Fresno, Calif.; 10 mi. of the Horse-tooth Feeder Canal of the Colorado-Big Thompson project, near Loveland, Colo., including a 1-mi. tunnel, a diversion dam, 13 siphons, and other structures; 12.5 mi. of canal near Cambridge, Nebr.; Muddy Ridge Tunnel and some portions of canal on the Riverton project in Wyoming; and 20 mi. of 115-kv. transmission line from Greeley to Loveland, Colo.

Wasteways on the Coachella Canal project in southern California, distribution system structures in Indio and Thermal on the same project, and a pumping plant near Middleton, Ida., are also scheduled by the Bureau for early bid.

Hagerman Project Power Plant Begins Operation

AFTER HEARING Idaho Power Company's president C. J. Strike outline a five-year \$50,000,000 expansion program predicated on making "a maximum contribution to the . . . development of the area," a crowd of more than 300 looked on Sept. 27 as Idaho's Lt. Gov. Donald S. Whitehead pulled the switch that set the new Upper Salmon Falls 16,500-kw. power plant in operation.

Located on the Snake river five miles south of Hagerman, the project is the first to be completed of five along the Snake river from Upper Salmon to Bliss, with a combined generating capacity of 185,000 kw. The Hagerman project was discussed in WCN for May, 1946. Guests, who were described by Strike as "representative of every segment of the population in our territory, inspected the 37-year-old Malad river 5000-kw. generator that is to be abandoned on completion of two new plants with a power output of 13,500 kw., and the present 7200-kw. Lower Salmon power source, to be supplanted by a new installation with a 60,000-kw. capacity.

Declaring that "any institution in business solely to make money is doomed to extinction," Strike stressed in an address at a later dinner meeting in Hagerman the achievements of his company in improving service and reducing its cost to consumers, and called attention to the

fact that the 31-year-old company's decision to embark upon its present far-reaching development program was reached in spite of public power proponents.

GE Announces First Of Four Bid Awards

GENERAL ELECTRIC Company has announced the first of four bid awards for the construction of a new \$2,000,000 motor manufacturing plant to be constructed in San Jose for the Apparatus Department of the company. The plant site is on 57 ac. just south of San Jose. Leland S. Rosener, San Francisco structural engineer, has been employed to make the design.

The Judson Pacific Murphy Corp. of Emeryville, Calif., will supply and erect approximately 650 tons of structural steel shapes. Fabrication has already begun at the Emeryville plant. Erection will begin shortly after the first of January, 1948, with completion scheduled later on in the spring.

The invitation to bid on the construction of a railroad spur to include tracks, ties and ballast, has been mailed. Awards will be announced soon.

The contract calling for general grading and excavating will be awarded at an early date. Grading and excavating will be the first project to get under way and will be started within a very few days after the award is announced. Estimated time for completion will be from three weeks to a month.

Specifications for the overall general construction will be mailed to a list of general contractors some time in November. The invitation will call for the erection of the building. Actual construction will begin some time in December.

The total manufacturing floor space in the new plant will approximate 120,000 sq. ft., with 23,000 sq. ft. added for offices and miscellaneous services.

Induction motors up to 500 h.p. will be made at the new San Jose manufacturing plant.

DISCUSSING PLANS for GE's new \$2,000,000 plant are: JOHN HOOD, Mgr. of the Oakland Works Apparatus Dept., CLAUDE A. SCHUTTER, GE Realty Corp., and CHARLES E. WILSON, President, General Electric Co.



OBITUARIES . . .

Don E. Meldrum, 63, real estate director for the North Pacific division, Corps of Engineers, died at his home in Portland on Sept. 2. A graduate of the University of Oregon, Meldrum had been for 25 yr. land and timber supervisor for the Crown Willamette Paper Co. in San Francisco and Oregon City. In 1933 he was appointed head of the land section in the Portland office of the Corps of Engineers, and was active in the acquisition of lands for Bonneville dam and other flood control and navigation projects. He was a registered civil engineer in Washington, Oregon, and California, and was a member of the California state bar.

Frank P. Peake, San Francisco contractor who built many of the city's schools died Aug. 29 at the age of 69. Peake came to San Francisco to help rebuild the city after the 1906 fire, and became well known as a partner in the firm of Mahoney Bros. At the time of his death, he was construction superintendent for Cahill Brothers.

Henry Manney, 83, early day Seattle contractor, died in Seattle on Sept. 2. A native of Canada, Manney came to Seattle in 1889. Among the early projects of the city with which he was connected were the grading of streets in Ballard and construction of the first sea wall at Alki Beach. He had been retired for the past ten years.

W. P. Brown, 58, district maintenance engineer for the Washington state highway department, died in Lewiston, Idaho, on Aug. 21. He had been maintenance engineer in the Yakima district for more than 20 yr.

Frank E. Weeks, 63, retired civil engineer for the Milwaukee railroad, died in Tacoma on Sept. 11. He had been in the Seattle engineering office of the road from 1912 until he was transferred to the Chicago office in 1933. He retired about a year ago, and had made his home in Seattle.

W. R. Barclay, formerly city engineer for both the city of Redondo Beach, Calif., and Hawthorne, Calif., died July 4.

Daniel P. Mumbrue, 79, retired cadastral engineer, died at his home in Helena, Mont., on Sept. 6. Mumbrue joined the U. S. Survey department in 1893 and served as deputy surveyor until 1911 when he joined the General Land Office and was assigned to headquarters at Helena. Following army service during World War I, he served as cadastral engineer in Alaska.

Guy B. Bebout, who was head engineer with the Corps of Engineers, Los Angeles district, and assistant to Colonel Moore, died Sept 20 in Los Angeles.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD

Extra Heavy Equipment Effectively Transferred By Conveyor-like System

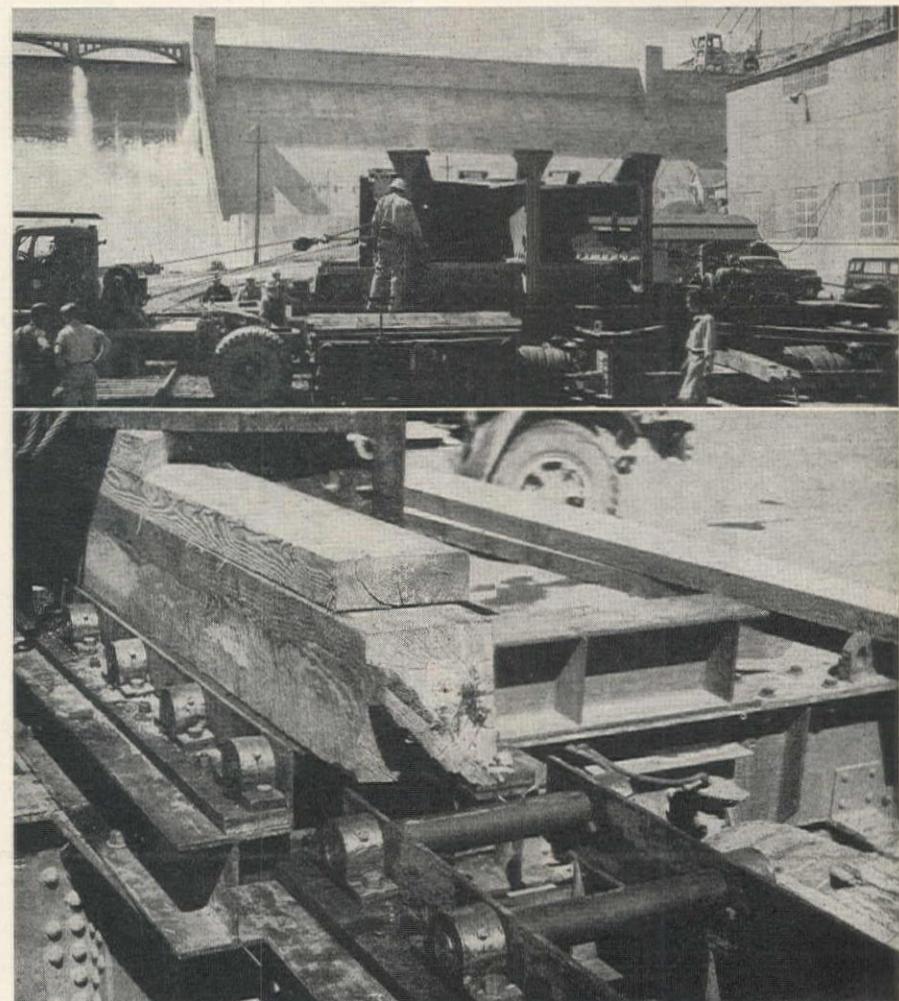
UTILIZATION of a conveyor-like system of steel rollers is proving effective at the Bureau of Reclamation's Grand Coulee Dam in Washington in transferring extra heavy equipment from trailer to railroad flatcar, or vice versa.

Shown in the accompanying pictures, a 60-ton "spider" for one of the new 108,000-kva. generating units in the west powerhouse is being transferred from a 200-ton, 32-wheel trailer to a flatcar. The heavy timbers supporting the spider slide easily from the set of rollers on the trailer to another set on the flatcar. Power for the operation is furnished by two truck winches.

Trailers have been used to haul equipment to the damsite since highway improvements forced abandonment of a section of the government railroad which led to the Bureau's dam on the Columbia river.

The lower picture shows a closeup of the spider moving operation and affords a clearer view of the roller mounting. Eighteen inches long and 3 in. in diameter, the rollers are set 17 in. apart. Total number of rollers is 38, with 12 on either side of the trailer conveyor and 7 on each side of the flatcar conveyor. Each roller moves in a bronze bearing, each of which has a lubricating fitting. A $\frac{7}{8}$ -in. steel plate under the timber supporting the spider prevents the rollers from cutting into the wood.

The Grand Coulee Dam will eventually supply the water for the entire Columbia Basin Irrigation project. Two



generating plants, located one on each side of the Columbia river, will be equipped with 8 generators each. The two temporary generators borrowed

from Shasta Dam for use during the wartime emergency are now being replaced by the larger, more modern generating units.

New Material Loading Tool Cuts Cost for Clearing Job

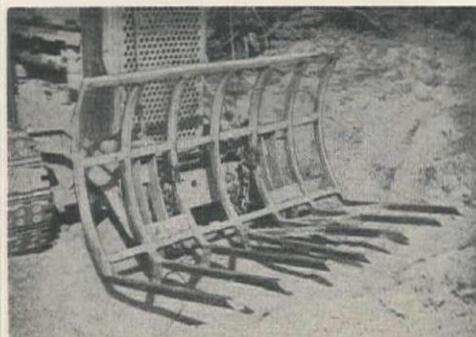
CONSTRUCTION on a job of grading and surfacing between Mira Loma and Ontario, Calif., was made easier by the ingenious equipment devised recently by four of the men working on the project

for Peter Kiewit Sons' Co., of Omaha, Neb.

In discussing a mutual problem concerning handling of trees, brush and rubble in clearing operations on the

highway job, Herb Studer, Al Galbreath, Maurice Kennedy and Tom Kelly, superintendents of the Mira Loma project, hit upon the idea of a new material loading tool. Similar to a buck rake, the equipment was adapted to the Traxcavator connections for a D-4 Traxcavator.

The rake, made of 2-in. square tool steel bars, may be lowered, raised, and dumped, the same as the bucket on the Traxcavator. With this attachment, trees, brush, and other combustible refuse can be raked up and piled without including the dirt. Since it makes the burning of the material much easier as well as the hauling, it results in a saving of cost also. Accompanying photos show details of construction and application of the seven-pronged rake.



PERSONALLY SPEAKING

Successful candidates for registration as a civil engineer and for authority to use the title "Structural Engineer" included the following northern Californians: Robert G. Beer, San Francisco; John W. Bell, San Leandro; Denzil M. Carr, Yuba City; Chas. D. Crawford, Modesto; Douglas S. Cruckshank, San Lorenzo; C. Edward Field, San Mateo; Ben C. Gerwick, Jr., San Francisco; Ernest Wm. Gommel, Jr., El Cerrito; Bernard B. Gordon, Alameda; R. C. Hammersmith, Oakland; James B. Hommon, Berkeley; Clifford C. Hull, Fresno; Loren W. Hunt, Berkeley; Herman R. Jantzen, San Francisco; Fred M. Johnson, San Mateo; Samuel G. Kobakov, San Francisco; Arthur W. Kaufman, San Francisco; John L. Kergel, Oakland; Stanley J. Kocal, San Jose; Dana D. Leslie, San Mateo; John A. Maga, San Mateo; George R. Maurer, Alameda; William E. McLennan, San Luis Obispo; Lawrence G. Mohr, San Bruno; R. P. Murphy, Oakland; Kaarlo W. Nasi, San Francisco; David Pirtz, Berkeley; Bennett L. Raffin, San Francisco; Raymond M. Rogers, San Francisco; Theodore W. Rodgers, San Jose; Donald P. Schultz, Oakland; Niels Schultz, Jr., Millbrae; Arthur B. Smith, Jr., San Francisco; Donald B. Smith, San Francisco; J. N. Soderstrand, Albany; Andrew P. Stevens, San Francisco; Harvey C. Stoddard, Oakland; William J. Talbot, Jr., San Francisco; August E. Waegemann, San Francisco; Harry Nels Wallin, San Francisco, and Arthur Reid Waltson, Oakland. Wesley Hayes, San Francisco, and Leonard F. Robinson, Oakland, were granted the right to use the title "Structural Engineer." Certificates of registration were authorized by the State Board of Registration for Civil Engineers at a meeting in San Francisco during the week of August 18, 1947.

Allen L. Darr, head of the river and harbor projects section of the Portland district, Corps of Engineers, retired at the end of August after 38 years in government engineering service. He had been on the staff of the Portland district since 1929. A native of Douglas County, Oregon, and a graduate of the University of Michigan, Darr began his engineering career in Tacoma in 1906, but joined the Reclamation Service the same year. In 1908 he transferred to the Indian Service as project engineer on the Yakima reservation. After short duties with the War Department Bureau of Insular Affairs and the Puerto Rican Service during 1918-19 he returned to the Bureau of Reclamation serving on the Rio Grande project in Texas and the Klamath project in Oregon. In 1925 he established a private practice at Medford, Ore., and in 1933 he initiated a safety program for the district and became the first district safety engineer. He was appointed head of the river and harbor projects section in 1934.

Earl S. Anderson, formerly a construction industry executive of the Los Angeles Chamber of Commerce, is new general manager of the Construction Industries Exposition and Home Show of Southern California, according to Milton J. Brock, president of the Home Show. The event is the biggest construction show in the United States in point of both attendance and exhibit space.



J. W. TAYLOR

J. W. Taylor has been appointed construction engineer in charge of the Deschutes project in central Oregon for the Bureau of Reclamation. Taylor was formerly chief of the engineering and estimates section of the branch of project planning in the Region 6 office at Boise. He succeeds Clyde C. Spencer, who has been appointed construction engineer for Hungry Horse dam in Montana.

Col. William Whipple, a member of the North Pacific division, Corps of Engineers staff at Portland since last May, has succeeded Col. G. J. Zimmerman as executive officer of the division. Col. Zimmerman has been transferred to the War College at Washington, D. C. Col. Whipple for the past two years has served in Europe as control officer and later secretary general for the office of military government in Germany.

WILFRED L. KARRER



Charles E. Shevling, formerly assistant resident engineer for the Seattle lighting department at Ross dam, has been appointed resident engineer succeeding Herbert F. Faulkner, who was retired on Aug. 1. Shevling's assistants on the job include Robert P. Sonntag, who was formerly office engineer and now assistant resident engineer, and H. P. Lees, concrete technician. Faulkner, who came out of retirement in 1943 to become resident engineer at Ross dam, has been with the Seattle engineering department since 1909, and is noted as an expert on concrete mixes. He first retired in 1940 following completion of the first step of construction at Ross.

A. C. Leonard, Rochester, Minn., is the new chief of the secondary-roads division of the Public Roads Administration, according to Thomas H. MacDonald, commissioner of the Public Roads Administration, Federal Works Agency. Leonard, who has served for the past 19 years as highway engineer for Olmsted County, Minn., will have staff responsibility for activities connected with the Federal-aid secondary road program.

Officers of the newly-organized Southern Idaho section of the American Society of Civil Engineers are two Boiseans, Myron Swendson of the Intermountain Equipment Co., and L. F. Erickson of the materials laboratory, Idaho State Bureau of Highways. Made up of former members of the Intermountain group, the new 67th section extends north to Idaho County.

George H. Shearer, state highway district engineer at Seattle, and Walter F. Winters, state highway district engineer at Vancouver, Wash., have exchanged positions with Shearer now in charge of District 4 at Vancouver after 12 yr. as Seattle district engineer and 2 yr. as Spokane district engineer. Winters served as county engineer in several western Washington counties prior to the war, served on Gen. MacArthur's staff during the war, and was appointed district engineer at Vancouver in June, 1946.

Donald C. Ketcham is the newly appointed acting manager of the Yellowstone District of Region 6, Bureau of Reclamation, with headquarters in Billings, Mont., it was announced recently by Kenneth F. Vernon, regional director. Ketcham was formerly assistant manager of the regional branch of power utilization. R. H. Workinger, who was an executive officer of the Bureau's Missouri Basin project activities staff, is now serving in a similar capacity for the Big Horn District, with headquarters at Cody, Wyo.

Wilfred L. Karrer, previously employed by the Bureau of Reclamation as chief of the branch of design and construction in the regional office in Boise, Ida., recently assumed the position of construction engineer for the Bureau in charge of the rehabilitation of the Lewiston Orchards project in Idaho. When finished, the \$1,700,000 project will provide a dependable irrigation water supply for 3,430 ac. of existing land and 348 ac. of new land, as well as a domestic water supply for 4,000 persons.

Stephen A. Wallace, Sr. has retired as highway engineer with the U. S. Public Roads Administration after thirty-five years of government service. Wallace, who lives in Denver, was instrumental in location of many national forest and park highways through the Rocky Mountain region, including the Trail Ridge road through Rocky Mountain National Park, and the north and south highway in Mesa Verde National Park.

R. L. Davidson, office engineer for the U. S. Bureau of Reclamation, is now engaged in preconstruction and construction work for the canal and lateral system extension of the Riverton Irrigation Project, Riverton, Wyo. He was recently engaged in similar work on the Central Valley project.

Arthur E. W. Dodds has opened a consulting office in the Smith Tower, Seattle, for the practice of engineering and architecture, specializing in building design. He was formerly chief engineer for the engineering sales division of Weyerhaeuser Sales Co., Tacoma.

Andrew J. Hull, Rock Springs, Wyo., civil engineer, has been appointed Laramie, Wyo., city engineer, succeeding C. O. Anderson. Anderson asked to be relieved some time ago to resume work toward a professional engineering degree at the University of Wyoming.

After 33 years of service, Dan Cate, assistant city engineer for Sacramento, is retiring. Cate, who was president of the Sacramento section of the American Society of Civil Engineers in 1940, is a well-known figure in engineering circles.

Hamilton K. Johnson, formerly chief engineer for the State Pollution Control Commission, Olympia, Wash., is now associated with the Pacific Water Works Supply Co. The water and sewage equipment company has offices in Seattle, Wash.

L. F. Erickson, formerly assistant to C. C. Hallvik, materials engineer for the Idaho Bureau of Highways, has been appointed materials engineer following Hallvik's resignation.

Recently selected executive officer of the California Lands Commission is Robert C. Hunter, former district engineer for the U. S. Engineers in the Sacramento, and more recently, Los Angeles, area.

L. W. Mabbott, formerly at Yuma, Ariz., is now working with the Bureau of Reclamation on the Riverton Project in central Wyoming on construction of canal extension and lateral system.

L. R. Durkee, division engineer at Seattle for the Community Facilities Bureau of the Federal Works Agency, was elected president of the Seattle Federal Business Association.

Glenn P. Snider, formerly with Geo. Herz Co., as key engineer for two years and prior to that in the engineering department of the Santa Fe Railway Co., is now in business for himself as engineer and contractor at Salome, Ariz.

Newly appointed assistant engineer of design and construction in the Los Angeles Department of Water and Power is James D. Laughlin, who reports directly to Grant E. Benkesser, engineer of design and construction. Laughlin, who has been with the department for 27 years, will coordinate design and construction of the Owens River Gorge power development project.

Col. Frank L. Beadle, executive officer of the Portland District, Corps of Engineers, has been transferred to the Duluth,

Minn., district as district engineer. Col. Beadle served in the Portland district during 1934 and 1935, and was assigned to the district again early in 1946.

Major Joseph S. Grygiel has been assigned to the Seattle district, Corps of Engineers, and will take over duties in the engineering division of the district office.

Lewis Ambrose, superintendent of the Ellensburg, Wash., city light department, has resigned that position.

SUPERVISING THE JOBS

Jack Ogden is general superintendent and Carl Marquard is field superintendent for the Wm. Simpson Construction Co. on their large job of constructing broadcasting studios and offices in Hollywood, Calif. Claud Beelman is architect for the building, with Herman Spackler as his associate. Foremen on the job include Chet Umbarger, general carpenter foreman; Frank Martinez, general labor foreman; Paul Andrews, Gil Reed, and Warren W. Ertel, carpenter foremen; Geo. Bertram, steel foreman for Coco Steel Co., who have the subcontract; Joe Mora, concrete foreman, Bud Blom is field engineer on the erection of the 4-story structural steel and reinforced concrete building, to be completed by April, 1948. Other men on the job include Bill Alpenfels, detailer; Wm. Simpson, Jr., expeditor; Marvin Peare, paymaster; Kenneth Carty, accountant; John Schilz, architect superintendent; and Jim Reynolds, timekeeper.

ler Howell, carpenter and concrete; James Barta, day shop foreman; Frank Barta, swing shift shop foreman, and Chas. W. Powers, auto shop foreman.

W. V. Greeley is project manager on the Morrison-Knudsen Co.'s Electra Powerhouse contract 1188. J. E. Cooney is superintendent for the P. G. & E., while George Bralye is M-K engineer. M. C. Silva is general foreman on the job, with J. A. Moren as master mechanic, G. V. Hollenshead as carpenter foreman, Gerald Aldridge as labor foreman, and G. J. Warner as carpenter shop foreman. W. F. Meyer has the position of office manager, while S. S. Johnston is chief timekeeper and Ralph E. Peck is camp manager. P. G. & E. personnel includes George Thatcher, chief engineer, and George Poore, inspector.

George V. Storm is general superintendent for the H. H. Larsen Co. at Redding, Calif. The company has three projects in this area: the P. G. & E. sub-station at Cottonwood, the sales and service building for the Sierra Tractor and Equipment Co., and additions to the Pacific Telephone and Telegraph installation. The projects comprise a total of over \$2,000,000. Thomas H. Townsend is field engineer for the company with Al Murdock and Bill King as general foremen, George Dow as steel foreman and Dewey Pence as concrete foreman. Philip Sittner is superintendent for the Redding Industrial Electric Co.

N. A. Ayers is supervising extensive changes to the Hollywood Turf Club in Inglewood, Calif., for L. E. Dixon Co. The job necessitates pulling the frame from under the old building and replacing it with heavier framing to support two additional floors and the grand stand. Other key men who have moved from their recently completed work on the Sears Roebuck building at Lynwood, Calif., to this job are Marcus Mikkerson, general carpenter foreman, F. C. Jackson, labor foreman, and Gerald Kemper, engineer.

V. A. Roberts is project manager, with Charles S. Bradley as his assistant on the Morrison-Knudsen Co. job of constructing Anderson Dam in Idaho. Construction engineer for the U. S. Bureau of Reclamation on the earth fill dam, begun in 1941, is Donald Walter, with John Erdle as job engineer. Superintendents on the project include: Wm. Denten, excavation and embankment; Robert Glenn, maintenance and repair; Claude Shaffer, carpenter and concrete. F. B. Morrison is office manager, Ralph Smith, purchasing agent, and Rex Swearingen, paymaster. Included in the list of foremen are: Frank Uriona, Geo. Osterdock, and Glenn Davis, excavation and embankment; Claude Bledsoe and But-

Jack McGuire is supervising a Morrison-Knudsen contract for a road job between Red Bluff and Mill Race Creek, Calif. Other personnel assigned to the project include: Howard "Red" Mercer, general foreman; Guy Lindsay, grade foreman; Dave Harrison, master mechanic; Willard Walker, plant foreman; Bob Lewis, dragline operator; and Ray Slavin, office manager. Fred F. Sanders is resident engineer for the state with A. E. Adams as his assistant.

Harry W. Erickson is superintendent for James I. Barnes Construction Co., Santa Monica, Calif., on their \$317,000 contract for a bridge sub-structure at Redding, Calif. Engineer for the company is J. L. Pierson, who designed all forms and cofferdams for the job. Position of general

foreman on the project is held by Leo Davis, in direct charge of piledriving operations, while R. K. Harris is project manager. B. W. Kuhn, Jr., is office manager with Bill Parrott as chief operator on the job, Everett Hale as carpenter foreman, and Butch Fernandez as master mechanic. Ralph Twaddle is resident engineer for the state.

L. B. Swan is general superintendent for S. & E. Homebuilders of Glendale, Calif., on their project of 309 single and 25 four-unit apartments of frame and stucco at Rosecrans and S. Vermont in Los Angeles. R. K. Carpenter is layout man, while framing foremen are L. R. Smith, Art Bickerstaff, Pete Hakala; roof foreman is Henry Twain, finish foreman is Chuck Ormiston, and labor foreman is Fred Davis.

C. H. Keefer is construction superintendent for the Aluminum Company of America, who are constructing a five-story reinforced concrete office and warehouse building in Oakland, Calif., at an estimated cost of \$300,000. Adolph Hockanson is superintendent for Swanstrom and Stahl, general contractors. Steel is being furnished by McGrath Steel Company and concrete by Nat Lena.

Joe B. Houston is the general superintendent on a store building, under construction by the Baruch Corp., Los Angeles, Calif. Other key men on the Los Angeles construction job consisting of one story and a basement of steel and concrete, include: J. L. Martin, carpenter foreman; Robert E. Alexander, architect; Parker-Zehnder & Associates, engineers; Benard Diamond, office manager; and Joe Swartz, foreman.

General superintendent for the Morrison-Knudsen siphon construction at Madras, Ore., is James S. Wright, with Rhodes Moller as manager of the project. Resident engineer for the \$195,161 contract, to be completed in December, is Stanley E. Kebbe. William A. Collins is general foreman, Leonard J. Burke, carpenter foreman, and Lloyd G. Miller office manager on the construction. Chas. McCurdy, Ft. Peck, Mont., has the reinforcing steel subcontract.

Knute Oberg is job superintendent for Oberg Bros., subcontractors on storm drain construction, channel work and bridges for Los Angeles. Office manager for the job, to be completed by the end of the year, is Leonard Swanson, with Earl "Breezy" Huddleston as carpenter foreman and George Olsen as labor foreman.

Frank Quilici is job superintendent for the Isbell Construction Co., Reno, Nev., on their \$207,000 contract to reconstruct the highway between Pioche and Ursine, Nev. Arnold Blair is grade foreman on the job, with W. G. Russom as carpenter foreman and Ray Gutowsky as timekeeper.

J. A. Calisher is job superintendent, with Jules Yates as general superintendent on erection of a 13-story office building in Los Angeles. Consolidated Steel Corp. has the steel contract on the construction, with Lefty Farwell, John Stallings, and Tex Joy as foremen and Wayne Johnston as office manager. Project is due to be completed by the first of the year.



OLAF LINDGREN was recently appointed superintendent of the Yakima Federal Reclamation Project in Washington. He replaces DAVID E. BALL, who died last March. Lindgren served for five years as assistant superintendent of the 450,000-ac. development.

George T. Hanford is now associated with the Northwestern Engineering Co. as construction superintendent on a 22 mi. grading and graveling project between Glasgow and Opheim, Mont. Grade foremen on the job are Arthur "Stub" Hansen and Wade W. Johnston, with C. R. "Spot" Denton as gravel foreman and Pat Sheffer as mechanic.

M. F. Kemper, head of the M. F. Kemper Co., with headquarters in Los Angeles, is personally supervising the tunnel lining contract in the subcontract on the Grossmont Tunnel at El Cajon, Calif. L. E. Dixon has the main contract for the job, part of the San Diego aqueduct. R. C. McLain is superintendent for L. E. Dixon Co., who are completing the tunnel driving. Bill Copenhaver is Dixon's office manager.

The Baruch Corporation, with S. A. Johnson as their general superintendent, are erecting five high school buildings of class A construction for the City of Los Angeles. Job engineer on the \$1,500,000 project is F. C. Butcher, with P. D. Benson as office manager. Alec Noble and Bill Allen are carpenter foremen, with Frank Garcia as concrete foreman and Tom Galidian as labor foreman. F. R. Schwarzkopf is also a foreman. Ceco Steel, holders of the steel subcontract, have D. B. "Dale" Grace as their foreman on the job.

Richard C. Egglestone, formerly of Egglestone & Root of San Bernardino, Calif., is general superintendent for Geo. Herz Co. on their Valley Boulevard overpass and underpass south of Fontana, Calif. Mel Kruse is structural superintendent, with Ray Hart as labor foreman and M. W. Senter as office manager. Carpenter foremen are Otis Burrows and W. R. Awalt, while John Dennison is steel foreman. For the state, Joe Hollister is resident engineer and Francis M. Morrill is bridge representative on the \$375,000 project.

Bill Orr is supervisor for Orr & Orr Construction Co., Phoenix, Ariz., on two jobs along the Clifton and Morenci State Highway in Arizona. Joe Place is grade foreman on the project, with Gust Swanson as powder foreman and R. Denison as master mechanic. Raymond Duff is a compressor operator, and James Bentley and Bill Glisson run shovels.

John "Stub" Vejtasa is superintendent for Stanley H. Arkwright, Inc., Billings, Mont., who is surfacing 12.6 mi. of the Lavina South Road, Golden Valley Co., Mont. John C. Brown is foreman on the \$118,484 project, with J. H. Bennetts as office manager.

Bob Scott has the position of superintendent for the Superior Construction Co., Las Vegas, Nev., on their \$250,000 job calling for construction of a school building in Las Vegas. L. C. Wolfram is office manager on the project, with S. F. Wanamaker as purchasing agent and Don Metzger as coordinator.

T. T. Cortelyou is Robert E. McKee's job superintendent on the El Paso, Tex., contractor's job of erecting 30 permanent type dwellings at the air field at Alamogordo, New Mex. Other key men on the \$482,200 project include W. O. Opdyke, general carpenter foreman, and J. R. Francis, construction engineer of the El Paso office.

M. Zimmerman is supervising the job for the Dey Contracting Co. on their bridge erection at Bidwell Bar, Oroville, Calif. Ed Reiners is carpenter foreman on the project, with Richard Green as bookkeeper. Resident engineer is F. P. Cordero and Donald F. Bolton is his assistant.

Paul Statler is now working for the A. S. Horner Construction Co. on their project of constructing two new siphons connecting the Adams tunnel with smaller tunnels to carry water to the Big Thompson River. The job is part of the Colorado-Big Thompson project.

Cliff McCurdy is job superintendent for Cahill Bros. on a large expansion of the Wieland Brewery at San Jose, Calif. Carpenter foremen for the project are Clyde McCurdy and Bob Loudon. Expansion planned will cost about \$500,000.

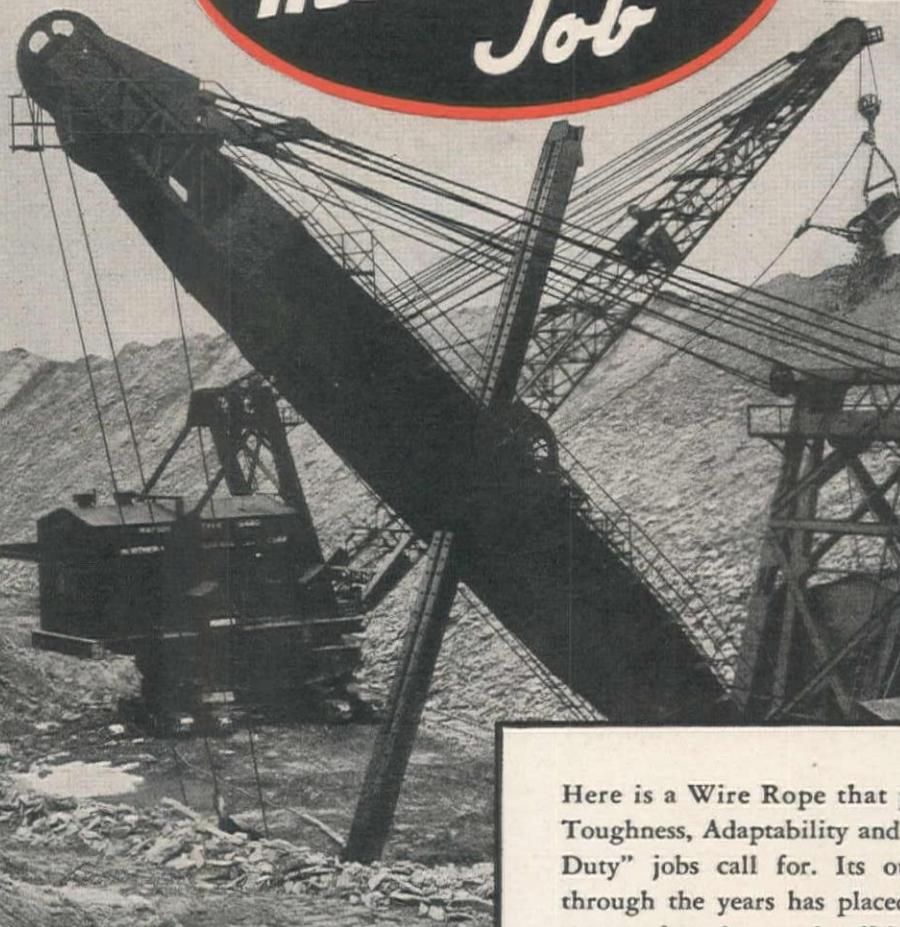
Ed Lindsay is job superintendent for the C. L. Hubner Co., Denver, Colo., on their job of surfacing 3.6 mi. of highway between Dowd and Wolcott, Colo. Dick Simmons is grade foreman on the \$250,000 contract, with Clyde Weatherly as structure foreman.

Job superintendent for the Del E. Webb Construction Co., Phoenix, Ariz., is Ervie Leedham, who is supervising their \$219,900 construction of a 2-story concrete and brick school building in Phoenix. F. W. Danielson is job engineer, with M. T. Rigg as timekeeper.

Oscar Erickson is supervising erection of an office building in Los Angeles for Wm. Simpson Co. Job engineers are Jack Rogers and Geo. Lenham, with Earl

For that
HEAVY DUTY
Job

The Durability of "HERCULES" (Red-Strand) Wire Rope is a big factor in speeding up production, and consequently reduces operating costs.



2

Here is a Wire Rope that provides the Strength, Toughness, Adaptability and Endurance that "Heavy Duty" jobs call for. Its outstanding performance through the years has placed it high on the list of approved equipment in *all* industrial fields.

Made in Round Strand and Flattened Strand Constructions—Preformed and Non-Preformed—there's a type exactly fitted to meet *your* particular requirements.

Your inquiries are invited!

"HERCULES"

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RED-STRAND

WIRE  **ROPE**

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

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NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE

Payne as office manager, **D. L. Bennett** as field engineer, and **Walter Simpson** as chief timekeeper. Foremen on the 10-story construction include: **Carl Erickson**, general carpenter foreman; **Geo. Mahan**, general labor foreman; **Tobe Wight**, concrete foreman; and **Herb Wright**, labor foreman. **Wurdeman** and **Bucket** of Los Angeles are architects.

W. J. Isbell is the Isbell Construction Co. supervisor on their job of paving curbs and gutters in portions of Reno, Nev. Other key men on the \$117,000 contract include H. B. "Hank" Isbell, general foreman, and Buck Piecetto, paving foreman.

H. L. Chandler is Howard Hastings' superintendent on construction of a restaurant building in Hollywood, Calif. Al Campbell is carpenter foreman, Ernie Williams steel foreman, and R. L. Hinkley labor foreman on the job.

Duffy Reed Construction Co. has Clarence Webb as general superintendent on a grading and oiling job in Twin Falls County, Idaho. Bob Schoppenies is resident engineer on the project, with George Earley in another key capacity.

Chas. McInroe is supervisor for Rogers Construction Co., Portland, Ore., on improvement of East Diamond Lake Junction of The Dalles-California Highway in Klamath Co., Ore. It is a \$769,200 contract.

Elmo E. Skuce is supervising installation of the remaining penstocks at Shasta Dam Power House for the Eichleay Corporation. Fred Ciatti is welding superintendent on the project, with Larry P. Bigleman as rigging foreman.

Earl Steiner is supervising a job of constructing 20 prefabricated dwellings at Davis Government Camp, Kingman, Ariz., for John Bohannan, Pacific Palisades, Calif. Joe Kitchen is foreman on the \$104,400 job.

N. S. Butt is supervisor for A. A. & E. B. Jones, Denver, Colo., on their \$638,416 contract calling for construction of produce, bakery, grocery and meat building additions to a building in Denver.

Robert J. Stoddard, formerly in a key capacity on various construction jobs for the Morrison-Knudsen Co., is now a superintendent in Long Beach, Calif., for the Sully Miller Construction Co.

Harvey Pruitt is supervising construction of a school building at McMinnville, Ore., for Viesko & Post, Salem. Assistant superintendent on the \$328,900 job is Earl Viesko.

J. C. Johnson is supervising a \$1,300,000 hospital building construction contract for the Mead & Mount Construction Co., of Denver, Colo.

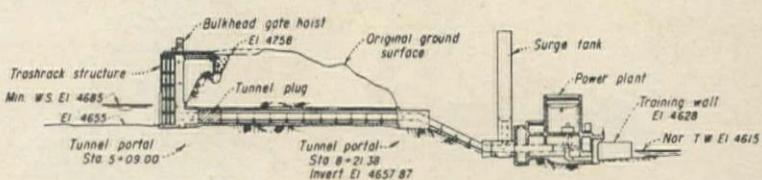
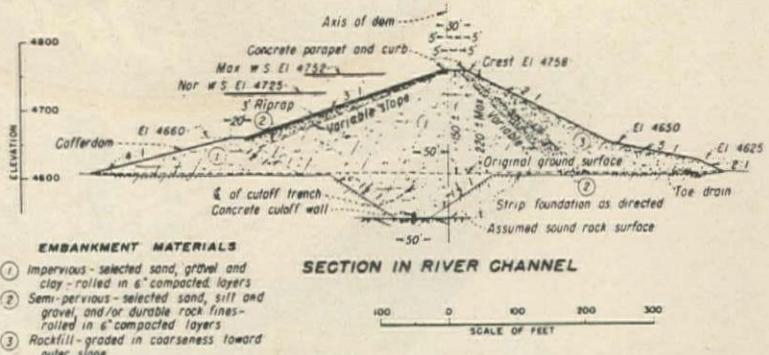
Roy House is superintendent and George Carver carpenter foreman on a new warehouse construction being built in Los Angeles by the Wm. P. Neil Co.

UNIT BID SUMMARY

Dam . . .

Wyoming—Hot Springs County—Bur. of Recl.—Dam

Morrison-Knudsen Co., Inc., Boise, Idaho, and associated contractors including J. F. Shea Co., Inc., Los Angeles, Calif.; Peter Kiewit Sons' Co., Omaha, Nebr.; General Construction Co., Seattle, Wash.; Pacific Bridge Co., San Francisco, Calif.; Utah Construction Co., Ogden, Utah; Raymond Concrete Pipe Co., San Francisco, Calif.; S. Birch & Sons Construction Co., Great Falls, Mont.; and F. & S. Construction Co.,



PROFILE ON E OF OUTLET TUNNEL

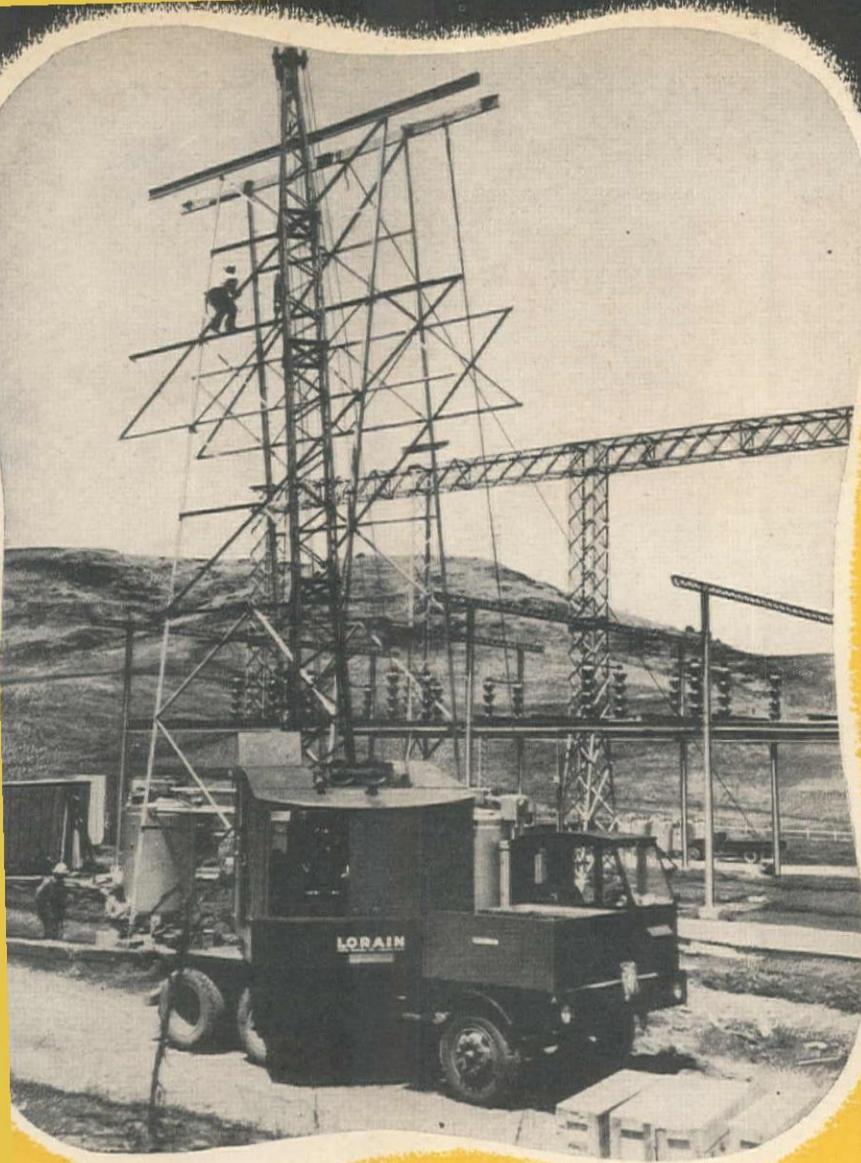
were awarded the \$13,899,999 contract by the Bureau of Reclamation, Thermopolis, for the construction of the Boysen dam, power plant and relocation of the Chicago, Burlington & Quincy Railroad. It is a part of the Missouri Basin project, Boysen Unit, on the Big Horn River, approximately 18 mi. south of Thermopolis; 1,475 days are allowed for completion. Unit bids follow:

(1) Morrison-Knudsen Co., Inc.....\$13,899,999 (2) Boysen Constructors\$16,468,423

SCHEDULE—PART 1
Boysen Dam and Power Plant

	(1)	(2)
Lump sum, diversion and care of river during constr. and unwatering foundations.....	\$302,000	\$100,000
80,000 cu. yd. excav., stripping borrow pits.....	.35	.37
450,000 cu. yd. excav., open cut	2.00	2.00
11,800 cu. yd. excav., diversion tunnel.....	12.50	20.00
2,800 cu. yd. excav., outlet tunnel.....	13.00	30.00
150,000 lb. furn. and install perm. struct. steel tunnel supports, liner plates and lagging.....	.20	.20
200,000 cu. yd. excav., found. of dam embank.....	1.90	1.50
1,000 cu. yd. excav., rock	20.00	45.00
900 cu. yd. excav., embank. toe drains	8.00	4.00
440 cu. yd. excav., water supply lines.....	8.00	15.00
900,000 cu. yd. excav. in borrow pit "B" and transport.....	.46	.60
600,000 cu. yd. excav., in borrow pit "B-1" and transport.....	.55	.65
30,000 cu. yd. excav., rock, and transport.....	3.00	2.50
15,000 cu. yd. excav., sand and gravel .....	.30	.30
500,000 yd. mi. transport. sand and gravel, to dam embankment.....	.15	.15
1,400,000 cu. yd. earth fill embank.....	.17	.17
150,000 cu. yd. load and haul stock-piled matl. ....	.50	.30
190,000 cu. yd. rock fill embank. ....	.50	.30
20,000 cu. yd. tamping of earth fill.....	2.00	3.00
27,000 cu. yd. backfill .....	.60	.75
2,400 cu. yd. rock fill	1.35	1.50
37,000 cu. yd. riprap upstream slope.....	1.20	1.10
6,500 cu. yd. dumped riprap	1.00	1.10
200 lin. ft. core drill, betw. depths of 0 and 35 ft.	8.25	6.50
150 lin. ft. core drill., depths of 35 and 60 ft.	7.90	7.50
250 lin. ft. core drill., depths of 60 and 110 ft.	7.90	9.00
4,700 lin. ft. drill. grout holes, 0 and 35 ft.	3.90	4.50
2,200 lin. ft. drill. grout holes, 35 and 60 ft.	3.90	6.00
1,800 lin. ft. drill. grout holes, 60 and 110 ft.	3.90	7.50
5,700 lin. ft., drilling with percussion drills.....	2.50	1.50
6,000 lb. furn. and place metal pipe and fittgs., found. grouting.....	.70	1.50
2,900 lb. install metal tubing and fittgs. for contraction joints.....	.70	1.50
14,000 cu. ft. pressure grouting	2.00	2.20
6,000 cu. ft. pressure grouting, packers.....	2.40	3.00
1,200 lin. ft. constr. 4-in. diam. sewer pipe drains.....	2.30	2.20
1,000 lin. ft. 6-in. diam. sewer pipe drains.....	3.00	3.00
1,300 lin. ft. 8-in. diam. sewer pipe drains.....	4.00	4.00
600 lin. ft. 10-in. diam. sewer pipe drains.....	5.00	4.50
300 lin. ft. laying 8-in. diam. sewer pipe drains.....	2.00	4.00
160 lin. ft. 10-in. sewer pipe.....	3.00	4.50
400 lin. ft. drill weep holes	3.00	4.50
4,250 lin. ft. drill holes, anchor bar, grouting bars.....	2.00	4.50
6,400 cu. yd. conc. in tunnel linings, portals.....	31.60	30.00
3,400 cu. yd. conc. in tunnel plugs and penstock supp.....	20.70	25.00
1,700 lb. furn. and install metal pipe for conc. cooling sys.....	.80	2.00
1,910 cu. yd. cooling conc. in tunnel plug.....	3.60	2.00
3,000 cu. yd. conc. in pipe anchor, surge-tank sup., outlet-pipe encasement.....	25.70	36.00

(Continued on next page)



New TL-20 MOTO-CRANE

"Turns on the Juice"

For
**PACIFIC GAS &
ELECTRIC CO.**
San Francisco, Calif.

Pacific Gas & Electric Co., San Francisco, Calif., erected their new Moraga, Calif. sub-station in a hurry with their new highly-mobile Thew-Lorain TL-20 Moto-Crane. With miles of hi-tension towers and many widely-separated stations to erect and maintain, P. G. & E. know what Moto-Crane mobility means in scampering from job to job in a hurry—and also what Lorain performance means on-the-job.

One of the many features offered by the TL-20 is "unit assembly" which means each major component can be removed and replaced as a complete unit. The clutch shaft, heart of the whole machine, is one compact, complete, replaceable unit. It features 5 identical and interchangeable clutches . . .



TL-20's offer a "unit engine assembly," with mounting frame and all accessories installed, which can be moved in or out through the rear doors of the cab as a complete unit . . . Even the cab is removable in one piece . . . The crawler propelling mechanism permits the central propelling mechanism and steering clutches to be replaced as one unit . . . The hoist shaft is another example of "unit assembly" offering unit interchangeability . . . Results? A machine (1) easy to service, (2) simple to maintain and (3) a winner with every operator.

Your nearby Thew-Lorain distributor has the TL-20 story ready and waiting for you. It will also pay you to learn about his parts and service facilities for backing up your jobs.

THE THEW SHOVEL COMPANY • LORAIN, OHIO

See Your
THEW
Lorain
REG. U. S. TRADE MARK
Dealer

BUNTING TRACTOR CO., Inc.	Boise, Twin Falls, Gooding, Fairfield, Burley, Carey, Idaho La Grande, Oregon	LIBERTY TRUCKS & PARTS CO.	Denver 1
CATE EQUIPMENT CO.	Salt Lake City 4	MOUNTAIN TRACTOR CO.	Missoula and Kalispell, Mont.
CENTRAL MACHINERY CO.	Great Falls and Havre, Mont.	LEE REDMAN EQUIPMENT CO.	Phoenix, Arizona
COAST EQUIPMENT CO.	San Francisco 3	SANFORD TRACTOR & EQUIPMENT CO.	Reno, Nev.
A. H. COX & COMPANY	Seattle 4, Wash.	TRACTOR & EQUIPMENT CO.	Sidney, Mont.
P. L. CROOKS & CO., INC.	Portland 10, Ore.	Branch: Miles City Equip. Co., Miles City, Mont.	
LE ROI-RIX MACHINERY CO.	Los Angeles 11	WORTHAM MACHINERY CO.	Cheyenne, Wyo., Billings, Mont. Branches: Sheridan, Greybull, Casper and Rock Springs, Wyo.



LUBRIPLATE maintains a durable, load carrying film at the "Friction Point," which reduces friction, retards progressive wear and prevents rust and corrosion. That is why gears lubricated with LUBRIPLATE last longer and run better. Don't take our word for it. Prove it to yourself. Thousands have in every industry.

LUBRIPLATE

Lubricants definitely reduce friction and wear to a minimum. They lower power costs and prolong the life of equipment to an infinitely greater degree. LUBRIPLATE arrests progressive wear.

LUBRIPLATE

Lubricants protect machine parts against the destructive action of rust and corrosion. This feature alone puts LUBRIPLATE far out in front of conventional lubricants.

LUBRIPLATE

Lubricants are extremely economical for reason that they possess very long life and "stay-put" properties. A little LUBRIPLATE goes a long way.



LUBRIPLATE

FISKE BROTHERS
REFINING CO.

NEWARK 5, N. J.

TOLEDO 3, OHIO

DEALERS FROM COAST TO COAST
CONSULT YOUR CLASSIFIED TELEPHONE BOOK

220 cu. yd. conc. floor trashrack struct.	28.00	18.00	
1,520 cu. yd. conc. trashrack struct. above floor.	57.60	96.00	
500 cu. yd. conc. in footing embank. cut-off wall.	28.00	40.00	
425 cu. yd. conc. in embank. cut-off wall	48.00	75.00	
5,200 cu. yd. conc. in spillway gate	33.50	48.00	
3,100 cu. yd. conc. in spillway door	25.30	18.00	
8,300 cu. yd. conc. in spillway walls	24.50	30.00	
1,500 cu. yd. conc. in spillway counterforted and cantilevered walls.	84.40	72.00	
7,800 cu. yd. conc. in power plant sub-struct.	28.10	25.00	
2,800 cu. yd. conc. in power plant intermediate struct.	68.30	60.00	
1,700 cu. yd. conc. in power plant superstruct.	73.60	100.00	
2,900 cu. yd. conc. in power plant, second stage.	33.50	30.00	
5,000 cu. yd. conc. in tailrace retaining wall	25.50	25.00	
800 cu. yd. conc. in tailrace training wall	33.50	30.00	
30 cu. yd. conc. in blockouts	45.00	60.00	
420 cu. yd. conc. in parapet and curb.	112.00	30.00	
160 sq. yd. chipping and roughening conc. surf.	5.00	2.00	
1,750 sq. yd. placing bonded conc. floor finish.	2.00	5.00	
500 lin. ft. placing cem. cove wall base	.80	1.00	
97,000 lb. furn. reinf. bars, 1-in. diam.	.081	.07	
134,000 lb. furn. reinf. bars, $\frac{5}{8}$ -in. diam. to $\frac{3}{4}$ -in. diam.	.083	.07	
6,000 lb. $\frac{1}{2}$ -in. diam.	.086	.07	
2,239,000 lb. placing reinf. bars, 1-in. diam.	.05	.04	
1,027,000 lb. place reinf. bars, $\frac{5}{8}$ -in. diam. to $\frac{3}{4}$ -in. diam.	.055	.05	
94,000 lb. place reinf. bars, $\frac{1}{2}$ -in. diam.	1.00	2.40	
300 insulating intersections	.80	1.20	
4,700 sq. ft. furn. and place joint filler.	9.00	1.20	
150 sq. ft. placing rubber water stops.	1.20	1.80	
2,450 lb. furn. and place metal sealing strips.	2.00	1.80	
400 lin. ft. const. control joints	5 lighting recesses	16.50	20.00
4,500 sq. ft. furn. and pl. memb. waterproofing	.75	.20	
4,200 sq. ft. furn. and apply bitum. dampproofing	1.10	.50	
5,200 sq. yd. furn. and apply clear dampproofing	.45	.50	
9,800 sq. ft. furn. and place roofing	.30	.50	
1,200 sq. ft. furn. and install glass block panels	4.20	4.00	
1,700 ft. b.m. wood framing partitions	.40	.50	
300 sq. yd. furn. and install metal lath and plaster for partitions	4.50	4.00	
85 sq. yd. suspended metal lath and plaster ceilings	6.00	5.00	
1,100 sq. ft. suspended acoustical unit ceiling	4.00	1.00	
3,000 lb. install metal inserts	.40	.50	
1,100 lb. install metal louvers	.40	.50	
900 sq. ft. install metal accordion doors	1.00	1.00	
720 sq. ft. install metal swing doors	1.00	1.00	
80 sq. ft. install metal fire doors	1.00	1.00	
100 sq. ft. furn. and install metal sash windows	4.50	1.50	
92,400 lbs. install bulkhead gate frames and guides	.10	.15	
30,000 lb. install bulkhead gates	.09	.04	
140,000 lb. install cranes and hoists	.07	.04	
1,171,000 lbs. install radial gates	.09	.08	
32,000 lb. install radial gate hoists	.07	.04	
260,000 lb. install trash rack metalwork	.07	.04	
514,000 lb. install ring seal and ring follower gates	.07	.04	
4,000 lb. install control app. and piping for ring seal and ring follower gates.	.30	.20	
56,000 lb. install hollow jet valves	.10	.05	
467,300 lb. install penstocks and outlet pipes	.12	.07	
440,000 lb. install surge tanks	.10	.07	
227,000 erect struct. steel power plant and outlet works bridge.	.08	.05	
26,000 lb. install pipe handrails	.31	.20	
82,000 lb. install metal pipes, fittings and valves, less than 6 in. diam.	.24	.20	
87,000 lb. install metal pipes, fittings and valves, 6 in. diam. and larger	.18	.15	
5,600 lb. install metal stairs	.25	.10	
15,000 lb. install oil tanks	.10	.05	
15,000 lb. install water storage tanks	.10	.06	
25,000 lb. install crane and rails on conc.	.09	.05	
8,000 lb. install pumps and eductors	.10	.10	
4,400 lb. install embedded metal frames	.20	.10	
15,000 lb. install misc. metalwork	.25	.24	
5,200 lb. install ice prevention air system	.30	.24	
3,000 lb. install ventilating system	.30	.30	
2,200 lb. plumbing fixtures	.30	.25	
400 lin. ft. install electrical nonmetallic conduit	1.20	.50	
17,650 lin. ft. install electrical conduit, $1\frac{1}{4}$ -in. or less in diam.	.82	.50	
7,300 lin. ft. install conduit, $1\frac{1}{2}$ -in. or more in diam.	1.08	.50	
2,700 lb. install ground wire and rods.	.75	.50	
500 tons transporting freight	20.00	15.00	

SCHEDULE—PART 2

Relocation of Chicago, Burlington, and Quincy Railroad

2,305,100 cu. yd. excav., roadway	.435	.65
35,802,000 sta. cu. yd. overhaul	.01	.005
5,550 M. gal. watering	2.75	3.70
1,350 roller hrs. of embankment	8.50	12.00
44,010 cu. yd. excav., structs.	3.50	2.50
106,265 cu. yd. backfill	.67	.75
100,295 cu. yd. compacting backfill	2.38	.75
48,600 cu. yd. riprap	3.00	4.00
320 sq. yd. dry-rock paving	7.00	10.00
285 sq. yd. grouted paving	9.00	12.00
140,000 cu. yd. excav., tunnel and shaft	16.05	26.00
724,300 lb. furn. and install perm. steel tunnel sup.	.22	.25
21 M. b.m. furn. and erect perm. timber tunnel.	300.00	350.00
3,230 lin. ft. drill holes for bars.	2.00	4.50
159,500 lin. ft. furn. and place grout pipe and fittings.	.43	.61
100,500 lin. ft. drill grout holes 12 ft. deep.	.90	1.2
150,700 cu. ft. pressure grouting	1.90	1.5
60 lin. ft. lay 12-in. diam. conc. pipe	2.70	4.0
462 lin. ft. lay 24-in. diam. conc. pipe	3.50	5.0
470 lin. ft. lay 36-in. diam. conc. pipe	4.70	7.0
238 lin. ft. lay 48-in. diam. conc. pipe	6.00	8.0
353 lin. ft. lay 60-in. diam. conc. pipe	8.00	10.0
16 lin. ft. lay 72-in. diam. conc. pipe	27.00	20.0
702 lin. ft. 30-in. diam. corr. metal pipe	2.50	4.0
1,168 lin. ft. lay 36-in. diam. C.I. pipe	4.70	5.0
70 lin. ft. lay 30-in. diam. C.I. pipe	6.00	7.0
96 lin. ft. lay 42-in. diam. C.I. pipe	7.50	8.0
1,062 lin. ft. lay 48-in. diam. C.I. pipe	8.00	10.0
324 lin. ft. lay 60-in. diam. C.I. pipe	13.50	20.0
31,510 cu. yd. conc. in tunnel and shaft	25.00	29.0
15,140 cu. yd. conc. in tunnel invert	22.30	22.0
1,740 cu. yd. conc. in tunnel portals	30.80	37.0
5,100 cu. yd. conc. in tunnel cut-and-cover sect.	30.80	45.0
660 cu. yd. conc. in tunnel substructs	22.10	22.0
520 cu. yd. conc. in tunnel vent. fanhouses	84.00	120.0
5,830 cu. yd. conc. in bridge	31.60	75.0
1,550 cu. yd. conc. in culverts	61.00	75.0

(Continued on next page)



"WE NEEDED MORE EQUIPMENT
TO FINISH THE JOB—AND A C.I.T.
CHECK HELPED US BUY IT" . . .

"After we tackled this road building job we ran into some tough construction work. The going was pretty rugged and, if we were going to keep on schedule, some additional earth-moving equipment was needed—and fast! We knew what was wanted but the cost would put a dent in our working funds so we decided to ask C.I.T. to finance the purchase for us.

"Their representative listened to our story, took down costs, a list of the equipment and how we wanted to pay for it. He worked out the details of a plan by which C.I.T. agreed to furnish 75% of the total and we could repay the loan over 24 months. In less than two weeks the new equipment was at work; we made up lost time and now see no reason why the job will not be completed on time . . . and at a profit."

Situations like this occur every day, and when they do, C.I.T. is ready to go into action, swiftly and

efficiently. If you need construction equipment—and would like to conserve your working funds—do as this contractor did; LET C.I.T. FURNISH THE FUNDS TO COMPLETE YOUR PURCHASE. We'll supply any amount needed at reasonable cost and repayment can be arranged to suit your needs.

Any standard make or type of equipment can be financed under this plan and several purchases, made from one or more distributors, can be combined in one easy-to-handle obligation. You amortize the loan through a series of monthly instalments while the new equipment helps pay for itself out of increased earning capacity. Any of these offices will furnish full details upon request.

*Send for NEW booklet describing the
C. I. T. Construction Equipment Plan*

 *The mark of leadership*

C. I. T. CORPORATION

Industrial and Equipment Financing

One Park Avenue
NEW YORK

One N. La Salle St.
CHICAGO

66 Luckie Street, N. W.
ATLANTA

660 Market St.
SAN FRANCISCO

416 W. 8th Street
LOS ANGELES

AFFILIATED WITH COMMERCIAL INVESTMENT TRUST INCORPORATED

Add up

These hard-facing
advantages...

- ✓ Excellent Arc Characteristics
- ✓ AC-DC Application
- ✓ No Slag Interference
- ✓ Self-Lifting Slag
- ✓ Solid, Dense Deposits
- ✓ Wide Amperage Range on Welding
- ✓ Rapid Deposition Rate
- ✓ Complete Uniformity
- ✓ Freedom from Moisture Absorption
- ✓ Can be Welded in All Positions
- ✓ Same Hardness and Wear Resistance on Multiple Deposits

It's the NEW COATED STOODY SELF-HARDENING

For maximum wear and impact resistance on heavy equipment.

Available anywhere in the U.S.A.—over 600 convenient dealers. 50c per lb. for $\frac{3}{8}$ " and $\frac{1}{4}$ " rod diameters F.O.B. Whittier or Dealers' Warehouse.

STOODY COMPANY

1156 West Slauson Ave., Whittier, Calif.

STOODY HARD-FACING ALLOYS

Retard Wear



Save Repair

1,928,800 lb. furn. reinf. bars, 1-in. diam.	.071	.07
735,800 lb. furn. reinf. bars, $\frac{5}{8}$ -in. to $\frac{3}{4}$ -in. diam.	.074	.07
82,700 lb. furn. reinf. bars, $\frac{3}{8}$ -in. diam.	.076	.07
3,957,600 lb. place reinf. bars, 1-in. diam.	.04	.06
1,470,000 lb. place reinf. bars $\frac{5}{8}$ -in. to $\frac{3}{4}$ -in. diam.	.048	.06
165,400 lb. place reinf. bars, $\frac{3}{8}$ -in. diam.	.051	.06
181,460 lb. furn. and install metal stops	.80	2.00
1,360 sq. yd. finish conc. surt.	3.30	3.00
38,300 sq. ft. furn. and place membrane waterproofing	.23	.30
67,700 sq. ft. furn. and place memb. waterproofing	.37	.50
70,300 sq. ft. furn. and place asph. plank protec. cover	.90	.75
8,400 lin. ft. drive steel piles	3.00	2.00
15,720 lin. ft. mfg. and driving conc. piles	7.90	9.00
2,250 lin. ft. furn. and install drain pipe	1.70	3.50
21,83 mi. const. right-of-way fence	980.00	600.00
4 metal fence gates	.87	120.00
6 scrap angle cattle guards	160.00	300.00
10 M. b.m. furn. and construct hwy. crossings	350.00	240.00
1,570 lin. ft. install elect. metal conduits, $1\frac{1}{4}$ -in. diam.	1.50	.75
29,160 lin. ft. elect. metal conduits, $1\frac{1}{2}$ -in. diam.	1.50	.75
2,800 lb. install elect. ground wires	.75	.75
7,920 lb. install frames	.20	.20
20,770 lb. install gratings	.09	.05
16,030 lb. install misc. metalwork	.20	.30
3,460 sq. ft. furn. and pl. roofing	.25	.75
15.20 track miles laying track	\$7,150	\$9,000
31,220 rail anchors	.10	.20
6 turnouts	550.00	700.00
58,890 cu. yd. ballasting	3.50	5.00
3,000 cu. yd. furn. ballast matl.	3.00	3.00
14.93 track miles removing rails	\$3,500	\$2,000
12.26 miles const. telegraph lines	\$3,000	\$2,200
2,500 lin. ft. erect wire cable guard fence	1.00	.50
2,600 tons crusher run base	1.50	2.00
16 tons furn. and apply liquid-asph. prime coat	45.00	35.00
1,908 tons gravel for oil-treated gravel surf.	3.00	3.00
63 tons furn. and apply liquid asph.	45.00	35.00
16 tons furn. and apply liquid asph. for seal coat	45.00	40.00
135 tons stone chips for seal coat	6.00	5.00
73 stations/finish 100 ft. of roadway of hwy.	30.00	20.00

California—Los Angeles County—Corps of Engrs.—Outlet Works

Guy F. Atkinson Co., Long Beach, Calif., submitted the low bid of \$694,385 before the Los Angeles District, Corps of Engineers, for the construction of the Santa Fe Dam outlet works. Work consists of construction of 16 slide gates with equipment for hydraulic operation, furnishing and installing gas-electric standby units, completing electric distribution, ventilation, communication and hydraulic pressure systems. Four hundred days are allowed for completion. Unit bids follow:

(A) Guy F. Atkinson Co.	\$694,385	(F) Chas. J. Dorfman	\$728,415
(B) Elliott, Stroud & Seabrook	709,706	(G) United Concrete Pipe Corp.	728,631
(C) A. Teichert & Son, Inc.	718,979	(H) Macco Corp.	731,933
(D) Sapp Construction Co.	724,598	(I) Contracting Engineers, Ltd.	757,335
(E) Johnson Western Co.	725,799	(J) Distelli, Spencer & Green	925,874

(1) lump sum, remove timber structure	(14) lump sum, vibration absorbing base
(2) 1,700 cu. yd. concrete	(15) lump sum, elec. standby generator and facil.
(3) lump sum, grouting gate castings	(16) lump sum, install trolley hoist and beam
(4) 223,400 lb. steel reinf.	(17) 150 lb. designated metal work
(5) 2,350 bbl. portland cement	(18) 140 lb. piezometer tubes
(6) 7,200 lb. elec. and telephone conduit	(19) 3 ea. hydraulic operated 6 x 9-ft. slide gates with automatic gate holder
(7) lump sum, elec. and intercommun. system	(20) 1 ea. hydraulic operated 6 x 9-ft. slide gate with automatic gate holder, with fittings for piezometer tubes
(8) 825 lb. galv. steel pipe	(21) 12 ea. hydraulic operated 6 x 9-ft. slide gates with automatic gate hangers
(9) lump sum, ventilating system	
(10) lump sum, gate vent and float well piping	
(11) 1,608,000 lb. install service gates	
(12) lump sum, oil pressure system	
(13) 4,100 gal. oil supply	

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1) \$3,000	\$2,200	\$2,500	\$10,000	750.00	\$1,335	\$12,000	\$10,000	\$3,000	\$1,500
(2) 14.00	15.80	26.50	20.00	11.00	25.00	15.50	30.00	13.00	33.00
(3) \$2,000	\$1,600	\$2,000	\$2,000	\$1,500	\$2,720	\$4,000	\$6,000	\$1,600	\$9,500
(4) ..... .10	.086	.08	.09	.095	.095	.09	.10	.098	.10
(5) 2.60	2.80	3.00	2.50	2.70	2.90	3.00	3.00	3.50	4.00
(6) ..... .80	.67	.60	.10	.70	.64	.85	1.00	.75	1.00
(7) \$10,000	\$9,150	\$5,500	\$8,893	\$6,000	\$6,400	\$10,500	\$6,000	\$6,000	\$10,500
(8) 1.00	.60	.90	.80	.75	.80	.60	1.00	1.00	.60
(9) \$3,500	920.00	\$3,200	\$3,320	\$3,000	\$2,479	\$2,800	\$3,000	\$1,800	\$4,900
(10) \$5,800	\$3,000	\$5,700	\$6,500	\$6,000	\$5,028	\$9,100	\$2,500	\$4,500	\$4,900
(11) ..... .035	.04	.03	.035	.031	.035	.04	.0342	.03	.08
(12) \$14,000	\$6,050	\$12,500	\$12,000	\$10,000	\$12,116	\$6,800	\$13,000	\$9,000	\$14,000
(13) ..... .50	.50	.45	.50	.60	.40	.80	1.00	.50	.66
(14) \$1,000	600.00	\$1,000	\$1,950	600.00	996.00	700.00	\$2,000	\$2,000	400.00
(15) \$9,500	\$7,400	\$9,000	\$10,000	\$6,000	\$7,785	\$11,000	\$10,000	\$10,800	\$11,900
(16) 870.00	300.00	500.00	920.00	50.00	445.00	800.00	500.00	\$1,000	660.00
(17) 1.00	.80	.80	4.00	.70	1.50	2.00	1.50	1.40	1.90
(18) 10.00	2.50	6.00	7.00	6.00	3.00	3.00	5.00	5.00	3.20
(19) \$34,102	\$33,825	\$34,800	\$34,234	\$36,666	\$34,885	\$35,300	\$33,100	\$38,000	\$40,000
(20) \$34,000	\$34,300	\$35,500	\$34,234	\$36,720	\$34,885	\$35,800	\$34,000	\$38,000	\$40,000
(21) \$32,500	\$34,825	\$34,300	\$34,234	\$36,666	\$34,600	\$33,400	\$33,100	\$38,000	\$40,000

Water Supply . . .

California—San Mateo and San Francisco Cos.—County—Supply Line

The M. & K. Corp., San Francisco, will build the \$667,279 sixty-inch supply line from Colma to the Sun-set reservoir in San Francisco. The San Francisco City and County Public Utilities Commission at San Francisco made the award. The following unit bids were submitted:

(1) M. & K. Corp.	\$667,279	(4) Macco Corp. & Morrison-Knudsen Co., Inc.	\$693,420			
(2) Artukovich Bros.	677,266	(5) Stoltz, Inc.	715,612			
(3) Pacific Pipeline & Engineers, Ltd.	677,912	(6) McGuire & Hester	842,792			
(19,000 cu. yd. trench excav., Class I.)	8.00	(2) (3) (4) (5) (6)	6.50			
(40,000 cu. yd. excav., Class II.)	2.80	1.50	1.85	1.90	3.20	3.00
600 cu. yd. excav. for struct., ftgs. and small pipe tr.	2.00	10.00	12.10	16.00	4.20	10.00
3,200 cu. yd. constr. embankments	1.20	3.00	1.70	.60	1.59	2.00
200 cu. yd. sand for backfill	2.00	4.00	6.05	1.00	3.15	2.00

(Continued on next page)

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You don't "baby" the Link-Belt Speeders—especially the LS-85, with extra power, stamina and endurance built into every detail. Balanced weight, large turn-table, hook rollers and oversize center pin give ground hugging stability, perfect control and extra digging and lifting capacity.

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(With full length track support)

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(Both Forward and Reverse)

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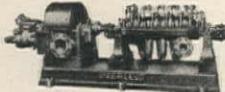


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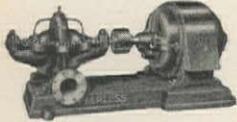
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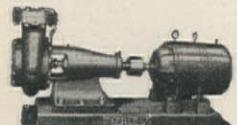
BOILER FEED
SERVICE

Peerless Type B multi-stage pumps are designed for boiler-feed, pipe line and refinery services delivering capacities up to 900 g.p.m. against pressures up to 700 lbs. For electric and other type drives from 60 to 350 h.p.



GENERAL
SERVICE

Peerless Type A pumps afford top-flight, continuous duty operation with capacities from 50 to 70,000 g.p.m. Heads: 15 to 300 ft. All types of drives: 1 to 1000 h.p. Sizes: 2" to 42" discharge. Split-case, single stage, double suction type.



PROCESS
SERVICE

Peerless Type DS is the ideal pump for chemical, oil, soap and similar process services. Capacities: 10 to 1500 g.p.m. Heads: up to 231 feet. Handles a wide variety of corrosive or non-corrosive liquids at temperatures to 200° F.; single stage, single suction.



FIRE
PROTECTION

Peerless Underwriters' Approved fire pumps are available for all fire protection services. Capacities: 500 to 2000 g.p.m. Pressures: to 150 lbs.; single and double stage types, for electric, engine, turbine drive or combinations.



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Distributors: 217 West Julian St., San Jose 5, Calif.; 301 W. Ave. 26, Los Angeles 31, Calif.; Fresno 16, Calif.; Quincy, Ill.; Indianapolis, Indiana.

900 cu. yd. repave roads, etc.	20.00	20.00	38.00	24.00	27.40	20.00
65 cu. yd. repave roads, streets with asph. conc.	10.00	12.00	26.50	30.00	19.35	15.00
50,000 sq. ft. repave roads and streets with 2-in. asph. wearing surf.	.12	.12	.25	.20	.145	.10
195,000 sq. ft. apply coal tar enamel or cem. mortar lining to steel pipe	.16	.15	.18	.18	.163	.20
201,000 sq. ft. apply coal tar enam. coating to steel pipe	.19	.18	.21	.20	.88	.20
12,500 lin. ft. deliver 60-in. steel pipe to site	1.25	1.00	1.00	1.30	1.26	2.00
9,800 lin. ft. install 60-in. pipe in 24-ft. sections	7.30	11.00	7.20	7.90	8.39	15.00
2,700 lin. ft. install 60-in. pipe in 30-ft. sections	6.50	10.00	5.75	6.00	6.90	10.00
14,750 lin. ft. install 60-in. pipe in 36-ft. sections	5.20	7.75	5.25	5.30	7.10	7.00
450 lin. ft. install 44-in. 5/16 steel plate pipe	4.30	5.00	10.15	5.00	21.45	7.00
80 ea. fabricate roundabout seams for 60-in. 3/4 and 5/16 in. steel plate pipe	160.00	225.00	230.00	260.00	124.00	300.00
130 ea. fab. for bends roundabout seams for 60-in. steel plate pipe	140.00	190.00	200.00	260.00	120.00	250.00
10 ea. fab. for bends roundabout seams for 44-in. by 5/16 in. steel plate pipe	90.00	135.00	160.00	160.00	90.75	200.00
29,500 lb. furn. and install steel pipe specials	.65	.60	.80	.70	.66	1.00
6,500 lb. furn. and install steel flanges and fittings	.80	1.00	1.00	1.20	.92	2.00
1,500 lb. furn. and install C.I. street manholes and fittings	.26	.50	.55	.40	.55	.50
18 ea. furn. and install manholes on pipe	500.00	425.00	555.00	600.00	185.79	600.00
3 ea. const. Type I air valve assemblies	280.00	250.00	385.00	280.00	195.90	500.00
10 ea. construct Type II, same	240.00	270.00	370.00	300.00	186.00	500.00
8 ea. construct Type III, same	300.00	260.00	400.00	300.00	200.00	500.00
6 ea. construct Type IV, same	180.00	160.00	275.00	170.00	174.00	300.00
18 ea. air release valve assemblies	200.00	160.00	225.00	170.00	150.00	300.00
6 ea. Type I blowoff assemblies	200.00	165.00	280.00	170.00	132.00	400.00
7 ea. Type II, same	200.00	165.00	355.00	170.00	174.00	400.00
2 ea. Type III, same	180.00	165.00	310.00	170.00	186.00	400.00
2 ea. Type IV, same	200.00	165.00	410.00	170.00	210.00	400.00
7,500 lb. furn. and install misc. steel	1.80	1.50	2.20	2.00	.78	2.00
6,500 lb. install C.I. pipe and fittings not included under other items	.12	.18	.45	.25	.13	.10
1 ea. install 42-in. bell end gate valve	420.00	\$1,100	325.00	750.00	673.45	600.00
4 ea. install 42-in. flanged end gate valves	\$1,700	\$6,800	\$1,340	\$3,000	\$1,957	\$2,000
2 ea. install 30-in. flanged end gate valves	720.00	\$1,400	460.00	700.00	770.60	600.00
1 ea. install 60-in. by 30-in. Venturi meter	720.00	\$1,200	\$1,700	\$2,000	\$2,170	600.00
45 cu. yd. conc. work for struct.	48.00	100.00	90.00	60.00	80.00	30.00
5,200 lb. furn. and pl. reinf. bars	.12	.12	.15	.20	.15	.10
Lump sum, const. Venturi meter house	720.00	\$1,200	\$1,200	\$2,000	923.60	\$1,200
1 mbm. furn. and install Douglas fir lumber	180.00	300.00	175.00	200.00	350.00	200.00
1,000 mbm. furn. and install redwood lumber	210.00	350.00	225.00	300.00	360.00	200.00
150 lin. ft. furn. and install steel pipe casings under highways by jacking method	72.00	35.00	70.00	80.00	62.40	50.00
6,500 lb. furn. and install corr. metal pipe culvert	.12	.25	.25	.20	.24	.50
Estimated field inspection at \$48 per calendar day (days)	150	150	150	150	180	150

Sewerage . . .

California—San Joaquin County—City—Trunk Line

Stockton Construction Co., Stockton, was low before the City Council of Stockton, with a bid of \$193,635 for the construction of a trunk line sewer from the South sewage treatment plant to Edison St. in Charter Way, and in Edison St. from Charter Way to Scotts Ave., Stockton. Unit prices were:

(1) Stockton Construction Co.	\$193,635	(5) R. Goold & Son.	\$294,571
(2) Artukovich Bros.	219,747	(6) McGuire & Hester	311,645
(3) Downer Co., Inc.	227,584	(7) M. J. B. Construction Co.	345,794
(4) A. Teichert & Son, Inc.	235,419		

(1)	(2)	(3)	(4)	(5)	(6)	(7)
9,192 lin. ft. 48-in. reinf. conc. culv. pipe	15.20	17.90	17.70	18.70	22.90	26.00
32 lin. ft. 48-in. reinf. conc. culv. pipe set in conc. cradle	52.00	35.00	25.20	75.00	62.69	80.00
1,297 lin. ft. 42-in. reinf. conc. culv. pipe	13.50	13.50	13.90	15.80	19.93	18.00
1,088 lin. ft. 36-in. reinf. conc. culv. pipe	12.00	12.50	9.90	13.30	17.43	16.00
46 lin. ft. 36-in. reinf. conc. culv. pipe set in conc. cradle	32.00	30.00	48.00	60.00	58.50	60.00
380 lin. ft. 21-in. extra str. reinf. conc. culv. (4000-D)	10.00	12.00	30.00	14.00	14.30	13.00
29 lin. ft. 24-in. reinf. conc. culv. pipe	10.00	10.00	30.00	20.00	7.38	19.00
4 lin. ft. 60-in. reinf. conc. culv. pipe	32.00	25.00	96.60	37.00	42.75	40.00
4 lin. ft. 18-in. reinf. conc. culv. pipe	10.00	6.00	36.00	9.00	9.38	12.00
17 ea. 5-ft. manholes	350.00	350.00	426.00	365.00	487.50	400.00
1 ea. 5-ft. manhole with 24-in. drain gate	400.00	450.00	600.00	450.00	687.50	500.00
1,000 cu. yd. crushed rock	2.80	4.00	5.10	5.00	5.69	5.00
4,960 lin. ft. 6-in. extra str. drain tile	.30	.20	.80	.50	1.03	.50
1 ea. special manhole	\$2,000	\$3,300	480.00	\$1,800	750.00	\$3,000
3,300 lin. ft. remove and replace 4-ft. fence	.40	.25	.30	.25	.63	.30
640 lin. ft. remove and replace 8-ft. fence	1.50	1.00	1.20	.50	3.13	1.00
170 lin. ft. remove and replace 10-ft. fence	2.00	1.00	1.20	.25	.63	.50
1 ea. remove and replace shed	500.00	200.00	600.00	100.00	750.00	900.00
1 ea. remove and replace screen conveyor	200.00	100.00	120.00	100.00	3,125	400.00

Highway and Street . . .

New Mexico—Otero County—State—Grade and Surf.

Armstrong & Armstrong, Roswell, with a bid of \$374,085 was awarded a contract by the State Highway Department at Santa Fe, for 12.5 mi. of excavation, rolling, ballast, leveling, grading and paving of the Carrizozo-Tularosa Road, U.S. Hwy. No. 54, in Otero Co. Four contractors submitted the following unit bids:

(1) Armstrong & Armstrong	\$374,085	(3) Brown Construction Co.	\$399,528
(2) Henry Thygesen & Co.	390,705	(4) Bowen & McLaughlin	456,759
(1)	(2)	(3)	(4)
Lump sum, removal of old structures	\$1,900	\$3,000	\$5,000
120,010 cu. yd. excavation, unclassified	.25	.24	.27
2,475 cu. yd. excavation for structures	2.00	2.00	2.10
395 cu. yd. excavation for pipe culverts	2.00	2.00	2.75
183,180 sta. yd. overhaul	.02	.02	.02
84,260 1/4 mi. yd. haul	.07	.07	.06
103 hr. mechanical tamping	6.00	6.00	4.00
1,000 hr. rolling, sheepfoot roller	4.00	4.50	5.00

(Continued on next page)

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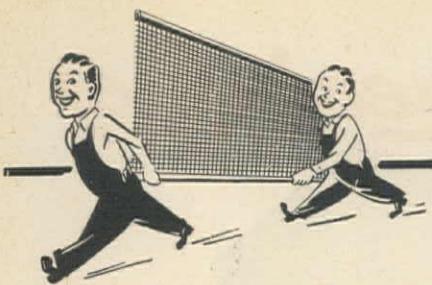
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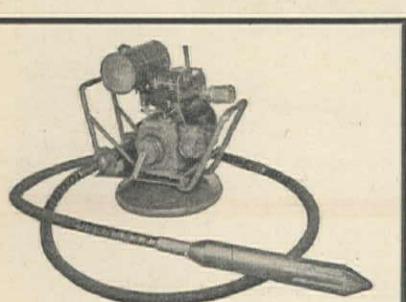
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29,095 ton ballast.....	.70	.70	.83	.81
34,080 ton leveling course.....	.80	.78	.86	1.05
5,050 M. gal. watering.....	3.75	2.60	4.00	3.00
3,289 cu. yd. Class A-E concrete.....	30.00	35.00	32.00	38.00
11,050 sq. yd. waterproofing.....	.50	.50	.60	1.00
440,440 lb. reinforcing steel.....	.10	.10	.08	.10
1,988 lin. ft. stand. reinf. conc. pipe, 24-in. diam.....	6.00	5.75	8.00	8.00
70 cu. yd. excavation for bank protection.....	3.00	2.00	2.00	1.85
400 cu. yd. wire enclosed riprap.....	5.00	6.00	5.00	7.40
15,225 lb. wire fabric.....	.15	.15	.20	.20
570 lin. ft. railroad rails.....	1.25	2.00	2.00	2.40
1 ea. reinf. conc. monument and markers.....				
49,220 lin. ft. galvanized barbed wire fence.....	.12	.12	.15	.16
15 ea. gates, Texas type.....	6.00	5.00	10.00	15.00
96 ea. bracing.....	4.00	4.00	3.00	5.00
104 ea. treated timber warning posts (reflect.).....	8.00	10.00	10.00	9.00
58 ea. right-of-way and station markers.....	4.00	5.00	4.00	6.00
8.4 mi. obliterating old road.....	150.00	150.00	100.00	350.00
1,035 bbl. cutback asphalt Type MC-1.....	5.20	5.50	6.00	7.50
5,270 bbl. cutback asphalt Type MC-3.....	5.35	5.75	6.00	7.50
16,670 ton top course surfacing.....	.83	.90	.85	.95
12,582 mi. mixing asphalt and aggregate.....	800.00	800.00	700.00	700.00
1,135 bbl. 120-150 asphalt for seal coat.....	5.60	5.75	6.00	7.40
1,980 ton aggregate for seal coat.....	4.00	4.00	5.00	6.50
3,857 mi. blading and shaping.....	500.00	400.00	300.00	770.00

Montana—Prairie & Dawson Cos.—State—Grade

Albert Lalonde Co., Sidney, submitted the low bid of \$499,586 and received the award for 24.1 mi. of grading of the Terry-Glendive Highway. Completion date is set at October 15, 1948. The State Highway Commission at Helena, made the award. Unit bids follow:

(A) Albert Lalonde Co.....	\$499,586	(G) N. W. Engineering Co.....	\$615,045
(B) S. Birch & Sons.....	571,335	(H) Inland Construction Co.....	634,315
(C) James D. Fogg.....	577,211	(I) S. J. Groves & Sons Co.....	669,114
(D) Peter Kiewit Sons Co.....	604,327	(J) Leach Bros.....	674,933
(E) A. Guthrie Co., Inc.....	608,687	(K) Stanley H. Arkwright, Inc.....	687,526
(F) H. & R. Construction Co.....	608,923	(L) H. E. Emme Construction Co.....	691,466

(1) 1,384,143 cu. yd. unclass. excav. and borrow.....	(17) 467.5 lin. ft. 90-in. sec. pl. pipe C. 10 Ga. M.
(2) 4,796 cu. yd. culvert excav.....	(18) 335.0 lin. ft. 90-in. sec. pl. pipe C. 8 Ga. M.
(3) 4,670,520 sta. yd. overhaul.....	(19) 340.0 lin. ft. 105-in. sec. pl. pipe C. 8 Ga. M.
(4) 20,750 M. gal. watering.....	(20) 137.5 lin. ft. 105-in. sec. pl. pipe C. 5 ga. M.
(5) 386 lin. ft. 15-in. reinf. conc. pipe culv.....	(21) 140.0 lin. ft. 120-in. sec. pl. pipe C. 8 ga. M.
(6) 3,796 lin. ft. 24-in. reinf. conc. pipe culv.....	(22) 112.5 lin. ft. 120-in. sec. pl. pipe C. 5 ga. M.
(7) 968 lin. ft. 36-in. reinf. conc. pipe culv.....	(23) 115.0 lin. ft. 135-in. sec. pl. pipe C. 5 ga. M.
(8) 524 lin. ft. 48-in. reinf. conc. pipe culv.....	(24) 2,178 cu. yd. grav. backfill for culv.
(9) 696 lin. ft. 60-in. reinf. conc. pipe culv.....	(25) 2,967 sq. yd. grouted riprap
(10) 68 lin. ft. 15-in. reinf. conc. pipe culv. ex. str.....	(26) 2 ea. conc. proj. markers
(11) 228 lin. ft. 36-in. reinf. conc. pipe culv. ex. str.....	(27) 117 ea. conc. r/w monuments
(12) 122 lin. ft. 48-in. reinf. conc. pipe culv. ex. str.....	(28) 128 ea. conc. station markers
(13) 368 lin. ft. 60-in. reinf. conc. pipe culv. ex. str.....	(29) 14,037 rod new fence
(14) 184 lin. ft. 36-in. corr. met. siph. pipe.....	(30) 89 ea. new fence gates
(15) 114 lin. ft. 48-in. corr. met. siph. pipe.....	(31) 120 rod reset fence
(16) 345.0 lin. ft. 75-in. sec. pl. pipe C. 3 ga. M.....	

(A)	(B)	(C)	(D)	(E)	(G)	(H)	(I)	(J)	(K)	(L)
(1) .....	.17	.16	.21	.202	.21	.215	.214	.23	.26	.252
(2)	1.50	2.00	1.61	2.00	2.00	1.50	1.60	2.00	1.50	2.00
(3) .....	.01	.01	.01	.008	.01	.01	.015	.01	.01	.015
(4)	1.00	1.75	1.84	1.50	1.50	2.00	1.80	1.50	1.75	2.25
(5)	2.75	4.00	2.84	3.00	3.00	3.00	3.40	3.75	3.00	2.50
(6)	4.60	7.50	5.15	6.00	5.25	5.00	6.15	7.00	5.50	4.90
(7)	8.75	14.50	9.85	11.00	10.00	10.00	11.15	13.50	11.00	9.23
(8)	14.00	23.00	15.65	17.00	17.00	14.00	18.25	21.00	17.00	15.50
(9)	21.00	33.00	22.61	26.00	25.00	22.00	25.70	30.00	25.00	23.00
(10)	3.00	4.00	3.05	3.50	3.25	3.50	3.40	4.00	3.00	2.75
(11)	10.00	16.50	11.12	12.00	11.00	11.00	11.40	15.00	12.00	10.40
(12)	17.00	26.00	18.08	20.00	19.50	16.50	20.65	24.00	20.00	17.55
(13)	25.00	39.50	27.12	31.00	30.00	25.00	30.15	35.00	30.00	26.60
(14)	8.50	13.50	10.15	14.00	10.00	12.00	10.45	13.00	12.00	9.00
(15)	12.50	18.00	13.63	17.00	15.00	15.00	15.10	17.00	15.00	15.00
(16)	35.00	47.00	36.60	45.00	39.50	40.00	42.65	46.00	40.00	38.35
(17)	32.00	41.00	30.02	45.00	36.00	40.00	35.60	50.00	36.00	40.50
(18)	35.00	45.00	32.78	46.00	38.45	42.00	43.25	53.00	39.00	45.00
(19)	40.00	50.00	38.67	50.00	46.10	45.00	49.75	55.00	46.00	48.25
(20)	45.00	58.00	44.64	55.00	52.30	55.00	56.20	60.00	53.00	55.75
(21)	42.50	57.00	43.92	60.00	50.40	55.00	56.20	65.00	54.00	60.00
(22)	50.00	66.00	50.74	65.00	58.00	65.00	63.55	70.00	61.00	66.50
(23)	55.00	77.00	57.63	75.00	65.50	75.00	72.60	75.00	71.00	80.00
(24)	1.00	1.70	1.90	2.00	3.00	3.00	2.20	1.50	2.00	2.00
(25)	6.00	6.50	4.26	9.00	10.00	7.00	5.00	8.00	5.00	7.50
(26)	25.00	15.00	12.23	25.00	25.00	20.00	25.00	20.00	25.00	20.00
(27)	4.00	5.00	3.17	6.00	4.00	8.00	5.60	4.00	4.00	5.00
(28)	5.00	10.00	5.18	8.00	8.00	10.00	6.90	7.00	6.00	8.00
(29)	1.85	1.90	1.98	2.10	2.00	2.00	1.75	2.00	2.50	2.75
(30)	3.00	5.50	2.88	4.06	5.00	10.00	2.50	3.00	5.00	5.00
(31)	1.00	1.50	1.40	1.55	2.00	1.00	1.50	2.00	2.50	3.00

Bridge and Grade Separation...

California—Alameda County—State—Superstruct.

J. H. Pomeroy & Co., Inc. of San Francisco, was awarded a contract in the sum of \$646,322 by the Division of Highways at Sacramento for the construction of the superstructure for an overhead structure over the tracks of the Southern Pacific Railroad, at Fruitvale Ave., in Oakland. Unit bids were as follows:

(A) J. H. Pomeroy & Co., Inc.....	\$646,322	(F) Chas. L. Harney & A. Soda & Son.....	\$674,266
(B) Haas & Rothschild.....	646,722	(G) Guy F. Atkinson Co.....	705,301
(C) Judson Pacific Murphy Co.....	657,414	(H) Frederickson & Watson.....	736,896
(D) S. J. Amoroso Co.....	648,252	(I) Clinton Construction Co.....	742,166
(E) Stoltz, Inc. & The Duncanson Harrelson Co.....	648,449	(J) Fredrickson Bros.....	759,501

(1) 3,328 cu. yd. Class "A" P.C.C. (struct.)	(5) 628,000 lb. placing bar reinf. steel
(2) 4,246,000 lb. furn. struct. steel	(6) 3,217 lin. ft. steel railing
(3) 4,246,000 lb. erect struct. steel	(7) Lump sum, deck drain system
(4) 628,000 lb. furn. bar reinf. steel	(8) Lump sum, electrical conduit

(Continued on next page)

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	44.00	35.00	48.00	37.00	38.00	40.00	47.75	44.63	49.00	48.00
(2)	.0775	.087	.078	.082	.08	.0825	.085	.0867	.092	.09
(3)	.02	.015	.01525	.018	.0225	.02	.02	.0285	.021	.025
(4)	.05	.058	.06	.063	.05	.055	.06	.054	.059	.06
(5)	.02	.022	.01	.015	.02	.024	.02	.0231	.018	.03
(6)	6.20	6.50	6.35	6.60	6.50	7.00	7.00	6.87	6.50	7.45
(7)	\$18,000	\$22,000	\$22,713	\$26,300	\$18,400	\$25,000	\$24,000	\$24,909	\$26,270	\$26,400
(8)	\$4,000	\$4,000	\$4,630	\$4,000	\$3,500	\$8,800	\$3,800	\$3,800	\$3,760	\$4,581

California—San Mateo County—State—Superstructs.

Carrico & Gautier, San Francisco, was awarded a \$989,150 contract by the Division of Highways at Sacramento for the construction of superstructures and approaches for four overcrossings on the Bayshore Freeway, between South San Francisco and Burlingame. The following unit bids were submitted:

(A) Carrico & Gautier	\$ 989,150	(E) L. E. Dixon Co.	\$1,082,376
(B) J. H. Pomeroy & Co., Inc.	1,023,871	(F) Guy F. Atkinson Co.	1,085,894
(C) Charles L. Harney &		(G) Peter Kiewit Sons Co.	1,091,816
A. Soda & Son	1,045,897	(H) United Concrete Pipe Corp. &	
(D) M & K Corp.	1,059,999	Ralph A. Bell	1,287,192

(1) 750 cu. yd. removing conc.	
(2) 18,000 cu. yd. roadway excav.	
(3) 215 cu. yd. struct. excav.	
(4) 25 cu. yd. ditch and channel excav.	
(5) 12,250 sq. yd. prep. subgrade (Class "B"). Method No. 2, and Class "C".	
(6) Lump sum, dev. wat. sup. & furn. wat. equip.	
(7) 150 M. gal. applying water	
(8) Lump sum, finishing roadway	
(9) 4,400 tons crusher run base	
(10) 6.5 tons asph. emulsion (pt. bdr. and sl. ct.)	
(11) 57 tons screenings (armor coat)	
(12) 3.5 tons liquid asph., SC-6 (armor coat)	
(13) 15 tons liquid asph., SC-1 (prime coat)	
(14) 1,600 tons asph. conc. (leveling course)	
(15) 1,100 tons asph. conc. (Type "A" surf.)	
(16) 50 lin. ft. raised bars	
(17) 22 cu. yd. Class "B" P.C.C. (parking strip)	
(18) 5,160 cu. yd., Class "A" P.C.C. (struct.)	
(19) 977,600 lb. furn. bar reinf. steel	
(20) 977,600 lb. placing bar reinf. steel	
(21) 5,919,000 lb. furn. struct. steel	
(22) 5,919,000 lb. erect struct. steel	
(23) 8,502 lin. ft. steel railing	
(24) 400 lb. misc. iron and steel	
(25) 462 cu. yd. Class "B" P.C.C. (curbs, gutters and sidewalks)	
(26) 1,050 lin. ft. remov. and salvag. metal plate guard rail	
(27) 650 lin. ft. mov. & reconst. metal plate guard rail	
(28) 61 ea. culvert markers and guide posts	
(29) 150 lin. ft. chain link fence	
(30) 600 lin. ft. remov. and reconstr. exist. prop. fences	
(31) 300 lin. ft. new property fence	
(32) 250 lin. ft. salvag. exist. pipe culverts	
(33) 125 lin. ft. relaying salvaged C.M.P. culverts	
(34) Lump sum, electrical lighting equip.	

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
(1)	4.50	5.00	4.00	7.00	5.00	2.50	6.00	3.00
(2)	.65	.60	.70	1.00	.70	.30	.79	.50
(3)	3.25	5.00	4.00	3.00	3.00	4.00	5.00	3.00
(4)	2.25	5.00	5.00	3.00	4.00	4.00	2.60	1.50
(5)	.22	.45	.06	.07	.16	.20	.16	.40
(6)	540.00	\$1,000	350.00	\$1,000	\$1,000	250.00	800.00	\$1,000
(7)	3.80	4.50	3.00	2.80	2.00	3.00	3.00	3.00
(8)	\$3,250	\$4,000	\$1,436	700.00	\$1,250	\$1,000	\$1,200	\$1,000
(9)	3.30	3.20	2.50	2.25	2.25	2.50	3.18	3.00
(10)	27.00	28.00	30.00	30.00	60.00	30.00	40.00	40.00
(11)	6.00	10.00	6.00	15.00	7.00	8.00	7.00	5.00
(12)	32.50	40.00	50.00	28.00	30.00	30.00	40.00	50.00
(13)	32.50	30.00	35.00	28.00	28.00	30.00	45.00	40.00
(14)	6.75	7.25	6.00	7.50	6.00	5.50	8.00	5.00
(15)	6.75	8.75	6.50	7.50	6.40	6.00	8.25	5.00
(16)	1.10	2.00	2.00	2.00	1.50	2.00	2.00	1.50
(17)	40.00	40.00	40.00	25.00	25.00	20.00	16.00	20.00
(18)	41.00	44.00	42.00	44.00	45.00	62.25	53.00	51.75
(19)	.055	.055	.06	.06	.06	.06	.05	.05
(20)	.015	.015	.015	.015	.02	.02	.02	.03
(21)	.075	.08	.082	.08	.08	.08	.071	.10
(22)	.017	.016	.02	.02	.025	.01	.027	.035
(23)	6.60	6.10	7.00	7.00	6.75	7.00	7.00	6.10
(24)	.30	.30	.50	.30	.25	.60	.30	.30
(25)	42.00	37.00	30.00	37.00	30.00	45.00	42.00	30.00
(26)	.50	1.00	.50	1.00	.50	1.00	.70	1.00
(27)	1.50	2.00	2.00	2.00	1.50	2.00	2.30	2.00
(28)	5.00	4.00	7.00	5.00	6.00	6.00	6.00	5.00
(29)	1.70	2.00	2.00	1.75	2.00	2.00	2.00	2.00
(30)	1.35	.56	.70	.60	1.50	.50	.35	1.00
(31)	2.20	.85	1.00	1.00	2.00	.50	.45	1.00
(32)	.50	2.00	1.50	1.25	1.00	1.50	1.50	1.00
(33)	1.10	3.00	3.00	2.00	1.00	2.00	1.00	1.00
(34)	\$27,496	\$22,175	\$25,000	\$27,556	\$25,000	\$25,000	\$25,000	\$25,000

Irrigation . . .

Oklahoma—Jackson County—Bur. of Recl.—Laterals

Stamey Construction Co., Hutchinson, Kans., submitted the low bid of \$430,165 to the Bureau of Reclamation at Denver, Colo., for the construction of earthwork and structures, Altus laterals 21.5 and 21.7 and sublaterals, W. C. Austin Project, near Altus. Unit bids follow:

(1) Stamey Construction Co.	\$430,165	(3) Pennington-Winter Construction Co.	\$529,380
(2) Oklahoma Paving Co.	493,854		
261,000 cu. yd. excav. for laterals			
50,000 sta. cu. yd. overhaul			
21,000 cu. yd. compact embankments			
24,000 cu. yd. excav. for drainage channels and dikes			
19,000 cu. yd. excav. for struct.			
16,500 cu. yd. backfill			
9,500 cu. yd. compacting backfill			
2,500 sq. yd. dry-rock paving			
2,200 cu. yd. conc. in struct.			
3,300 bbl. furn. and handling cement			
198,000 lb. furn. and place reinf. bars			
44 sq. ft. furn. and place elastic filler matl. in joints			
700 lb. furn. and place metal water stops			
63 m.b.m. furn. and erect timber in structs.			
436 lin. ft. furn. and lay 18-in. diam. conc. pipe			
2,224 lin. ft. furn. and lay 24-in. diam. conc. pipe			
976 lin. ft. furn. and lay 30-in. diam. conc. pipe			
876 lin. ft. furn. and lay 36-in. diam. conc. pipe			
520 lin. ft. furn. and lay 42-in. diam. conc. pipe			
52,000 lb. install gates			
5,400 lb. install misc. metalwork			
		(1)	(2)
		.45	.50
		.05	.05
		.20	.15
		.30	.39
		.30	.40
		1.00	1.00
		.40	.40
		1.00	1.00
		4.50	5.00
		75.00	90.00
		3.50	4.00
		.14	.15
		3.00	2.00
		.40	.30
		200.00	200.00
		2.75	4.00
		3.75	5.00
		5.25	7.00
		7.50	10.00
		9.75	12.50
		.15	.20
		.20	.25

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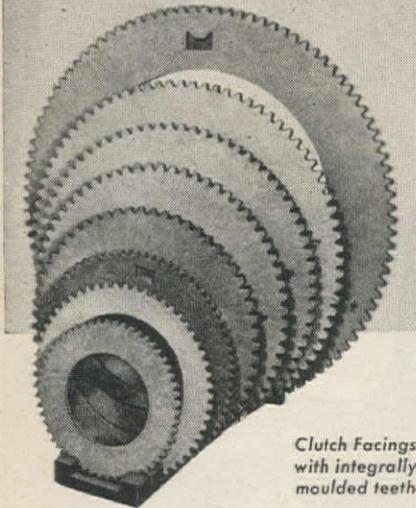
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Wyoming—Fremont County—Bur. of Recl.—Earthwork & Struct.

Morrison-Knudsen Co., Inc., Boise, Idaho, was awarded a \$668,938 contract by the Bureau of Reclamation at Denver, Colo., for the construction of earthwork and structures, Wyoming Canal, Riverton Project, Station 883 plus 00 to Station 1606 plus 00. Time for completion is 450 calendar days. The work is located approximately 25 mi. northwest of Riverton. The following unit bids were submitted:

(A) Morrison-Knudsen Co., Inc.	.....	\$668,938	(K) Ryan Construction Co.	.....	927,082
(B) Foley Bros., Inc. & Marsch	.....	672,746	(L) C. F. Lytle Co. & Amis Construction Co.	.....	947,841
(C) Marshall & Haas	.....	698,518	(M) S. Birch & Sons, and F & S Contracting Co.	.....	965,835
(D) Gibbons & Reed Co.	.....	800,909	(N) D. G. Gordon & Bressi-Bevanda Constructors	.....	1,043,743
(E) Parson & Fife and L. T. Johnson Co.	.....	836,721	(O) Wunderlich Co., James & Phelps Constructors	.....	1,092,273
(F) Peter Kiewit Sons Co.	.....	899,053	(P) Utah Construction Co.	.....	1,241,944
(G) Barnard-Curtis Co.	.....	463,037			
(H) Geo. R. Stacy*	.....	448,316			
(I) Sharrock & Pursel and Kinsley-Moore Co.	.....	911,679			
(J) S. J. Groves & Sons Co.	.....	913,132			

FIRST SCHEDULE

(1) 850,000 cu. yd. excav., common, for canal
(2) 2,000 cu. yd. excav., rock, for canal
(3) 4,000 cu. yd. haul
(4) 6,000 cu. yd. compacting embankment
(5) 44,000 cu. yd. excav., common, for struct.
(6) 2,700 cu. yd. excav., rock, for struct.
(7) 10,000 cu. yd. backfill
(8) 6,000 cu. yd. compacting backfill
(9) 10 cu. yd. cobble riprap
(10) 1,900 cu. yd. conc. in struct.
(11) 2,850 bbl. furn. and handling cement
(12) 280,000 lb. furn. and pl. reinf. bars
(13) 300 sq. ft. furn. and pl. elastic filler in joints
(14) 320 lin. ft. pl. rubber water stops in joints
(15) 1,750 lb. furn. and pl. metal work stops in jts.
(16) 38 m.b.m. furn. and erect timber in bridges
(17) 200 lin. ft. lay 18-in. diam. lock-jt. conc. pipe
(18) 100 lin. ft. lay 48-in. diam. lock-jt. conc. pipe
(19) 34,000 lb. install gates and gate hoists
(20) 8,500 lb. install misc. metalwork

FIRST SCHEDULE

(A)	(C)	(D)	(E)	(F)	(I)	(K)	(M)	(N)	(O)	(P)
(1) .....	.67	.17	.23	.23	.245	.25	.247	.21	.26	.345
(2) .....	.50	1.00	1.50	1.50	.85	1.25	1.50	3.00	1.00	2.00
(3) .....	.05	.05	.02	.03	.03	.10	.05	.04	.02	.08
(4) .....	.40	.60	.30	.15	.45	.30	.30	.60	.75	.25
(5) .....	.60	.55	.45	1.50	.85	1.50	1.50	1.50	.50	.82
(6)	2.00	3.00	2.50	2.50	2.60	3.00	1.50	6.00	2.50	4.00
(7) .....	.25	.50	.50	.40	.75	1.00	.20	.75	.40	.50
(8)	2.00	2.00	2.00	.80	.275	1.50	1.50	2.00	5.00	2.60
(9)	5.00	10.00	4.00	10.00	6.00	20.00	10.00	10.00	20.00	12.00
(10)	47.50	48.00	45.00	45.00	54.00	47.50	55.00	75.00	85.00	60.00
(11)	4.00	6.00	5.40	6.00	5.60	6.00	4.50	7.00	5.00	4.50
(12) .....	.125	.11	.10	.11	.115	.11	.12	.16	.12	.13
(13)	1.00	1.00	2.00	1.50	1.50	2.50	.60	1.50	2.00	1.40
(14)	1.80	1.00	2.00	1.00	1.50	1.00	.30	1.10	2.00	2.50
(15) .....	.50	.75	.25	.40	.50	1.00	.50	.50	.50	.55
(16)	150.00	200.00	150.00	200.00	250.00	210.00	200.00	300.00	200.00	200.00
(17)	1.50	2.00	1.50	2.00	1.75	3.00	1.50	3.00	5.00	5.00
(18)	2.50	5.00	4.50	9.00	5.00	7.00	5.00	10.00	10.00	15.00
(19) .....	.07	.25	.20	.20	.11	.10	.20	.30	.30	.35
(20) .....	.10	.25	.20	.25	.20	.25	.20	.30	.50	.20

SECOND SCHEDULE

(A)	(C)	(D)	(E)	(F)	(I)	(K)	(M)	(N)	(O)	(P)
(21) .....	.167	.17	.23	.21	.23	.25	.247	.196	.26	.345
(22) .....	.50	1.00	1.50	1.50	1.00	1.00	1.50	3.00	1.00	2.00
(23) .....	.60	.55	.45	1.50	.85	1.00	1.50	1.50	.50	.82
(24)	5.00	3.00	2.50	2.50	2.60	5.00	1.50	6.00	2.50	4.00
(25) .....	.25	.50	.50	.40	.75	.50	.20	.75	.40	.50
(26)	2.00	2.00	2.00	.80	.275	1.00	1.50	2.00	5.00	2.60
(27)	5.00	10.00	4.00	10.00	6.00	20.00	10.00	10.00	20.00	12.00
(28)	47.50	48.00	45.00	45.00	65.00	42.00	55.00	77.00	85.00	60.00
(29)	4.00	6.00	5.40	6.00	5.60	6.00	4.50	7.00	5.00	4.50
(30) .....	.125	.11	.10	.11	.115	.11	.12	.16	.12	.13
(31)	1.00	1.00	2.00	1.50	1.50	2.50	.60	1.50	2.00	1.40
(32)	1.80	1.00	2.00	1.00	1.50	1.00	.30	1.10	2.00	2.50
(33)	1.50	2.00	1.50	2.00	1.75	2.50	1.50	2.50	5.00	5.40
(34)	2.00	3.00	2.25	4.50	2.15	6.00	2.50	4.00	7.00	12.00
(35)	2.50	4.00	2.95	6.50	3.15	10.00	3.00	5.50	8.00	13.00
(36)	2.50	4.50	3.90	7.50	3.95	10.00	4.00	6.50	9.00	14.00
(37)	2.50	5.00	4.50	9.00	5.00	12.00	5.00	10.00	10.00	15.00
(38)	3.50	5.50	5.60	12.00	6.00	15.00	7.00	12.00	12.00	20.00
(39) .....	.07	.25	.20	.20	.20	.20	.10	.20	.30	.35
(40) .....	.10	.25	.20	.25	.30	.25	.20	.30	.50	.20

SECOND SCHEDULE

(A)	(C)	(D)	(E)	(F)	(I)	(K)	(M)	(N)	(O)	(P)
(21) .....	.167	.17	.23	.21	.23	.25	.247	.196	.26	.345
(22) .....	.50	1.00	1.50	1.50	1.00	1.00	1.50	3.00	1.00	2.00
(23) .....	.60	.55	.45	1.50	.85	1.00	1.50	1.50	.50	.82
(24)	5.00	3.00	2.50	2.50	2.60	5.00	1.50	6.00	2.50	4.00
(25) .....	.25	.50	.50	.40	.75	.50	.20	.75	.40	.50
(26)	2.00	2.00	2.00	.80	.275	1.00	1.50	2.00	5.00	2.60
(27)	5.00	10.00	4.00	10.00	6.00	20.00	10.00	10.00	20.00	12.00
(28)	47.50	48.00	45.00	45.00	65.00	42.00	55.00	77.00	85.00	60.00
(29)	4.00	6.00	5.40	6.00	5.60	6.00	4.50	7.00	5.00	4.50
(30) .....	.125	.11	.10	.11	.115	.11	.12	.16	.12	.13
(31)	1.00	1.00	2.00	1.50	1.50	2.50	.60	1.50	2.00	1.40
(32)	1.80	1.00	2.00	1.00	1.50	1.00	.30	1.10	2.00	2.50
(33)	1.50	2.00	1.50	2.00	1.75	2.50	1.50	2.50	5.00	5.40
(34)	2.00	3.00	2.25	4.50	2.15	6.00	2.50	4.00	7.00	12.00
(35)	2.50	4.00	2.95	6.50	3.15	10.00	3.00	5.50	8.00	13.00
(36)	2.50	4.50	3.90	7.50	3.95	10.00	4.00	6.50	9.00	14.00
(37)	2.50	5.00	4.50	9.00	5.00	12.00	5.00	10.00	10.00	15.00
(38)	3.50	5.50	5.60	12.00	6.00	15.00	7.00	12.00	12.00	20.00
(39) .....	.07	.25	.20	.20	.20	.20	.10	.20	.30	.35
(40) .....	.10	.25	.20	.25	.30	.25	.20	.30	.50	.20

Tunnel . . .

Oregon—Douglas County—Calif.-Ore. Power Co.—Reinf. Conc.

The L. E. Dixon Co. of San Gabriel, Calif., submitted the low bid of \$1,056,750 to the California-Oregon Power Co., Medford, and was awarded the contract for the construction of the 5,600 to 6,000-ft. Toketee tunnel project on the North Umpqua River. The tunnel is to be of reinforced concrete and 12 ft. in diameter, lined with 2-in. concrete and reinforced with 1-in. hoop bars and 3/4-in. long bars, timber framed and gravel packed. Unit bids are as follows:

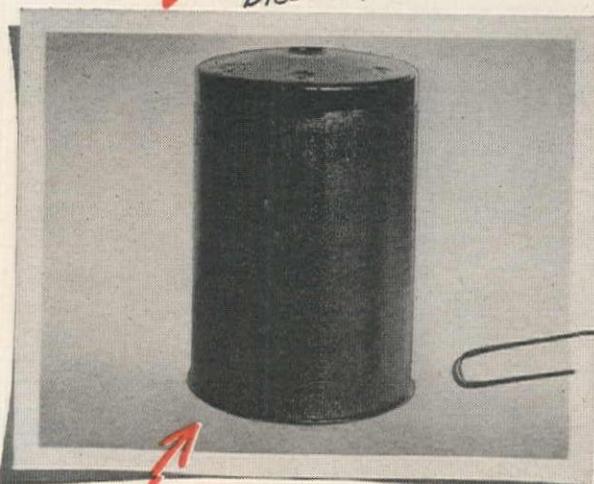
(1) L. E. Dixon Co.	.....	\$1,056,750	(3) Walsh Construction Co.	.....	\$1,556,940
(2) J. A. Terteling & Sons	.....	1,122,655	(4) Wixson & Crowe	.....	1,814,650
1,000 cu. yd. open cut excav., common	.....	1.20	.50	.96	1.00
200 cu. yd. excav., rock	.....	3.00	3.50	3.00	4.00
600 lin. ft. tunnel excav. in earth	.....	112.00	168.80	228.00	210.00
5,000 lin. ft. tunnel excav. rock	.....	153.00	168.80	216.00	211.00
5,600 lin. ft. install permanent timber	.....	25.00	24.00	38.40	100.00
2,500 cu. yd. backfill	.....	15.00	4.50	19.20	20.00
150 cu. yd. excav. for tunnel drain in earth	.....	5.00	2.50	6.00	5.00
1,500 cu. yd. clear for tunnel drain, rock	.....	25.00	7.50	38.40	10.00
6,000 cu. yd. install tile drain pipe	1.00	3.00	2.40	.75
200 cu. yd. gravel filter for tunnel drain	5.00	4.50	13.20	5.00

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gummed up like this
after about 600 hours
on oil he's been using



Joe says nothing but
RPM Delo Oil in his
Diesels from now on

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after 600 hours on RPM Delo
Diesel Engine Lubricating Oil.
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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

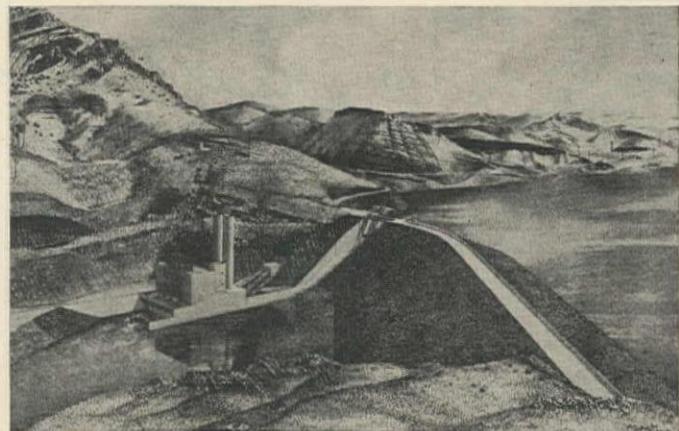
Large Western Projects . . .

The Guy F. Atkinson Co., Long Beach, Calif., received a \$1,916,667 award from the Department of Water and Power of Los Angeles, for the construction of the main building superstructure for units 3, 4 and 5, cable tunnel betw. control house and main building, transformer foundations and miscellaneous work for the Harbor Steam Plant in Wilmington, Calif. The same concern will receive \$694,385 from the Corps of Engineers at Los Angeles for the construction of 16 hydraulic slide gates, completion of electric distribution system, ventilation and communication systems as well as furnishing and installing gas-electric standby units for the Santa Fe Dam outlet works, Los Angeles County, Calif.

S. K. Jones, Memphis, Tenn.; H. N. Rogers & Sons Co. of Memphis; and Forcum James Co., Dyersburg, Tenn., submitted the low bid of \$6,349,830 to the Corps of Engineers at Fort Lincoln, North Dakota, and were awarded the contract for Stage 1 of the \$177,000,000 Garrison Dam. The contract calls for the moving of approximately 11 million cu. yds. of dirt for the main embankment, stockpiling of 390,000 cu. yds. of lignite coal, and the construction of a test tunnel. The dam will be located near Riverdale.

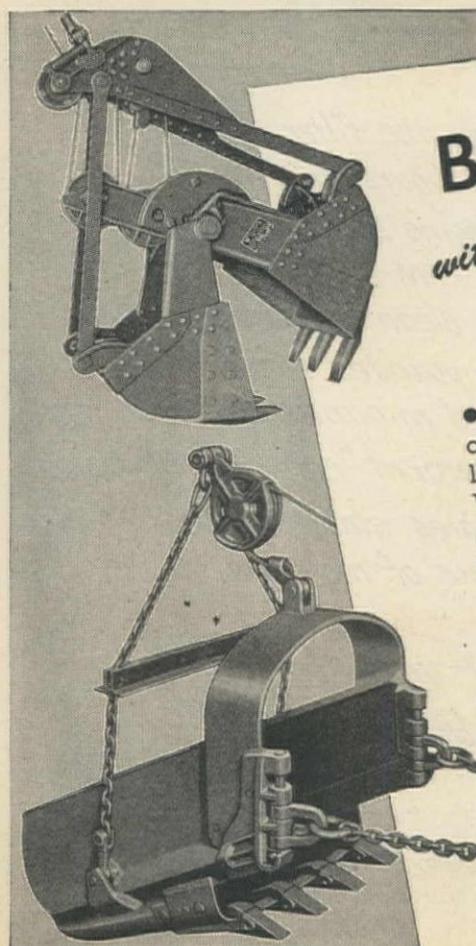
William Radkovich Co., Los Angeles, Calif., is to receive \$949,717 from the Bureau of Yards & Docks, Washington, D. C., for 69 married officers' dwellings at the Naval Ordnance Test Station, Inyokern, Calif.

Morrison-Knudsen Co., Inc., Boise, Idaho, was awarded a contract in the sum of \$13,899,999 by the Bureau of Reclamation at Thermopolis, Wyo., to construct the Boysen dam on the Big Horn River in Hot Springs County, Wyo. A power plant to be



equipped with two 7,500-kw. generators is to be built, and 14 mi. of the Chicago Burlington & Quincy Railroad is to be relocated. The dam will be earth fill, 150 ft. high and 1,100 ft. long and is to be located approx. 18 mi. south of Thermopolis. The entire job will take slightly more than four years for completion.

Haddock-Engineers, Ltd., Oceanside, Calif., will receive \$3,187,259 from the Bureau of Yards & Docks, Washington, D. C., for the construction of 380 dwellings and water, sewage and elec-



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Cleveland, 4, Ohio

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Coast Equipment Company, San Francisco, Calif.
Le-Roi Rix Machinery Company, Los Angeles, Calif.
Loggers & Contractors Machinery Company, Portland, Oregon
Construction Equipment Corporation, Spokane, Wash.
Pacific Hoist & Derrick Company, Seattle, Wash.

SEND FOR BULLETIN

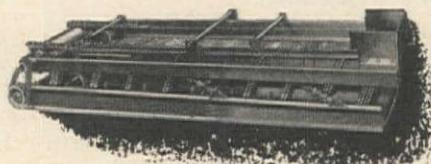


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a screening
problem...**

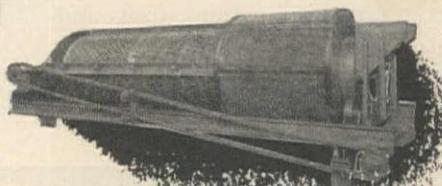
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McKiernan - Terry S-8 Single - Acting Pile Hammer driving concrete piles for the huge cargo and warehouse Pier No. N for the Norfolk & Western Railway at Norfolk, Va. Project of McLean Contracting Company

Erection of this immense pier of the Norfolk & Western Railway called for driving 5386 pre-cast concrete piles averaging 14 tons apiece. Because of the nature of the soil to be penetrated, gravity-driven McKiernan-Terry Single-Acting Pile Hammers were the contractor's wise choice.

Whatever your pile-driving problem may be, you will find a McKiernan-Terry Pile Hammer that is designed for exactly such a job. Ten standard sizes in Double-Acting Hammers; five Single-Acting Hammers and two Double-Acting Extractors are available in the McKiernan-Terry line.

FOR FULL INFORMATION

Write for illustrated descriptive bulletins No. 55 and No. 57, giving specifications, advantages, etc. You'll find them very useful to have on file.



McKiernan-Terry
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trical facilities at the Naval Ordnance Test Station, Inyokern, Kern County, Calif.

Haas & Rothschild, San Francisco, Calif., submitted the low bid of \$503,840 to the City Council of Antioch, and was awarded the contract on Alternate 'B' for construction of the water treatment plant at Antioch, Calif.

Tom L. Gogo, Los Angeles, Calif., was awarded a contract in the amount of \$428,769 by the Central Contra Costa Sanitary District of Walnut Creek, for the installation of the main trunk sewer from the treatment plant north of Pacheco to south of Walnut Creek, Calif.

Rogers Construction Co., Portland, Ore., will regrade, apply base coat and surface approximately 24.7 mi. of the Forest Boundary-Agency Section of the Warm Springs Hwy. in Jefferson and Wasco Counties, Ore. The Oregon State Highway Commission, Salem, made the \$556,415 award.

The L. E. Dixon Co., San Gabriel, Calif., will construct the reinforced concrete, 12-ft. diameter, approximately 6,000-ft. long Toketee Tunnel in Douglas County, Oregon. The Public Engineering Service Corp., Chicago, Ill., awarded the \$1,056,750 contract, first phase of a \$4,000,000 power program at Toketee.

Bowen & McLaughlin, Phoenix, Ariz., will be given \$524,625 by the State Highway Department at Santa Fe, New Mexico, for about 8.7 mi. of application of base and surfacing of Clovis-Texico road in Curry County, N. Mex.

The Eastern Construction Co., Long Beach, Calif., will build the \$2,000,000 Class 'A' 12-story apartment building in Long Beach, for the Claborne Construction Co., Long Beach.

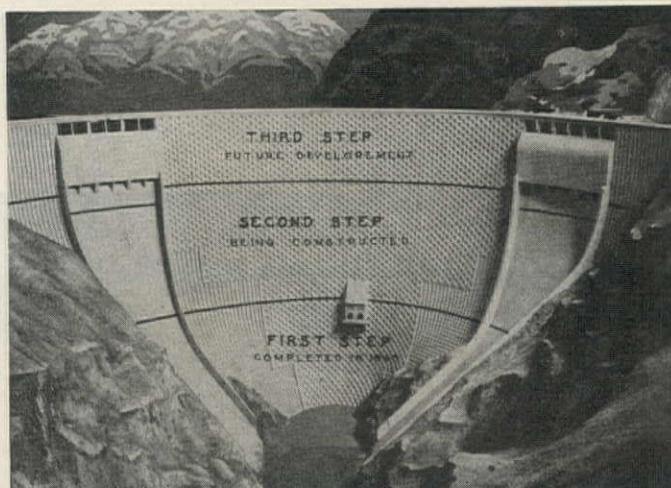
Albert Lalonde Co., Sidney, Montana, was awarded a \$499,587 contract by the State Highway Commission at Helena, Mont., for 24 mi. of grade and drain of the Terry-Glendive road in Dawson and Prairie Counties, Mont.

M. & K. Corp., San Francisco, Calif., will be given \$991,890 by the Sailor's Union of the Pacific, San Francisco, for the erection of a reinforced concrete and steel, Class 'A', two-story and basement, recreation building in San Francisco.

Shumaker & Evans Construction Co., Los Angeles, Calif., will build the \$1,200,000 one and part two-story, cement block and frame, 100 room El Rancho Hotel on a 9-acre site in Reno, Nevada. Thomas Hull Enterprises of Hollywood, Calif., made the award.

Stone & Webster Engineering Corp., San Francisco, Calif., was awarded a \$1,870,000 contract by the Pacific Gas & Electric Co., San Francisco, for the construction of a reinforced concrete and structural steel, two-story addition to the power generating plant at Hunter's Point, San Francisco.

General Construction Co., Seattle, Wash.; **Morrison-Knudsen Co., Inc.**, Boise, Ida.; and **J. F. Shea Co.**, Los Angeles, Calif., will be given \$5,298,965 by the Seattle Board of Public Works at Seattle, Wash., for the construction of the third step of the



erection of the Ross Dam, across the Skagit River in Whatcom County, Wash. The dam will be raised 90 ft. above the second step to attain a height of 540 ft. above bedrock.

Reynolds Electric Co., El Paso, Tex., receives \$356,859 from the Bureau of Reclamation, Denver, Colo., for the construction of a 115-kv., three-phase, 60-cycle single circuit transmission line betw. Elephant Butte and Socorro in New Mexico.

Highway and Street . . .

Arizona

APACHE CO.—W. J. Henson, Box 471, South Grant St., Prescott—\$345,274 for 4.7 mi. grade, base and bitum. surf. of Holbrook-Lupton Hwy., near Sanders—by State Highway Department, Phoenix. 9-11

COCONINO CO.—Kolob Construction Co., 731 N. 19th Ave., Phoenix—\$107,982 for approx. 6 mi. grade, drain and base, Flagstaff-Kendrick Park Hwy., from Ft. Valley extending northwesterly—by State Highway Department, Phoenix. 9-11

GREENLEE CO.—Orr & Orr Construction Co., 302 W. Monte Vista Rd., Phoenix—\$163,027 for approx. 2 mi. grade, drain, base and surf. of Clifton-Springfield Hwy. from Clifton north—by State Highway Department, Phoenix. 9-11

YAVAPAI CO.—Packard Contracting Co., Luhrs Tower, Phoenix—\$103,590 for 3.5 mi. grade and surf. Prescott-Simmons Hwy., from Willow Creek bridge extending north, near Prescott—by State Highway Department, Phoenix. 9-11

California

ALAMEDA CO.—Piombo Construction Co., 1571 Turk St., San Francisco—\$181,806 for .6 mi. rock slope protection, drainage, etc., San Francisco-Oakland Bay Bridge Toll Plaza, Oakland—by Division of Highways, Sacramento. 9-22

ALAMEDA CO.—San Francisco Bridge Co., 503 Market St., San Francisco—\$270,100 for sand fill at San Francisco-Oakland Bay Bridge Toll Plaza, Oakland—by Division of Highways, Sacramento. 9-12

MONO CO.—Nevada Constructors, Inc., 519 Plumas St., Reno—\$554,582 for 3.4 mi. grade and penetration treatment, Lane 'B' and 'D', Coleville—by Division of Highways, Sacramento. 9-4

RIVERSIDE AND SAN BERNARDINO COS.—Peter Kiewit Sons Co., 345 Kieways Ave., Arcadia—\$170,554 for 6 mi. grade, surf., and apply seal coat betw. Cloverdale Ave. and Valley Blvd.—by Division of Highways, Sacramento. 9-11

SACRAMENTO CO.—A. Teichert & Son, Inc., Box 1133, Sacramento—\$123,434 grade and pave, C St., Elvas Ct., Meister, 35th, 36th and 37th Way, Sacramento—by City Council, Sacramento. 9-4

SAN DIEGO CO.—Griffith Co., 1060 S. Broadway, Los Angeles—\$197,311 for 1.1 mi. grade, PCC pave, and dividing island, Washington, Normal Sts., and El Cajon Blvd., betw. Balboa Freeway and Texas St., San Diego—by Division of Highways, Sacramento. 9-11

SANTA CLARA CO.—A. J. Raisch Paving Co., 900 W. San Carlos St., San Jose—\$182,646 for 3.5 mi. grade, plant-mix surf., and bridge widening, San Jose-Stevens Creek Rd., betw. Saratoga Ave. and Cupertino—by Division of Highways, Sacramento. 9-4

SISKIYOU CO.—Fredrickson & Watson Construction Co., 873 81st Ave., Oakland—\$651,030 for 7.8 mi. grade, drain and surf., betw. Camp Lowe and Bailey Hill—by Division of Highways, Sacramento. 9-25

Montana

BEAVERHEAD CO.—Union Construction Co., Inc., Box 1845, Great Falls—\$253,609 for 15 mi. grade and surf. of Dillon-Wisdom rd.—by State Highway Commission, Helena. 9-8

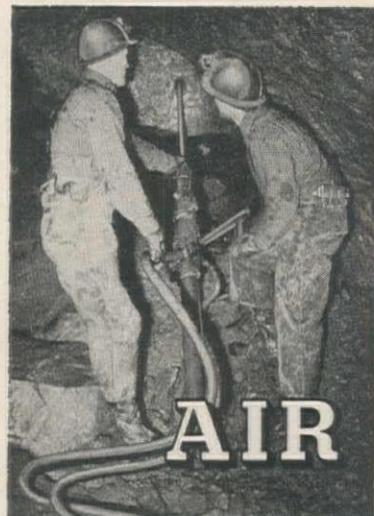
DAWSON AND PRAIRIE COS.—Albert Lalonde Co., Sidney—\$499,587 for 24 mi. grade and drain of Terry-Glendive rd.—by State Highway Commission, Helena. 9-8

LEWIS AND CLARK AND BROADWATER COS.—Union Construction Co., Inc., Box 1845, Great Falls—\$202,040 for relocation of 9.5 mi. of rd. at Canyon Ferry Dam project approx. 17 mi. east of Helena—by Bureau of Reclamation, Helena. 9-12

MISSOULA CO.—S. Birch & Sons Construction Co., Ford Bldg., Great Falls—\$177,244 for 2.7 mi. grade, drain and surf. of Evaro Hill rd., west of Missoula—by State Highway Commission, Helena. 9-8

Nevada

CLARK CO.—Dodge Construction, Inc., Fallon—\$88,000 for hwy. constr. betw. Paradise Valley and Las Vegas—by Department of Highways, Carson City. 9-19



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Keep pneumatic equipment working at full capacity with MINE-KING Air Hose. Extra thick pliant rubber cover resists severest abrasive action. A brown oil-proof tube, encased in high quality braided framework, gives MINE-KING the fortitude to withstand gouging, and prevent hose wall separation due to oil and moisture. Assure a steady flow of air with extra durable MINE-KING Hose.

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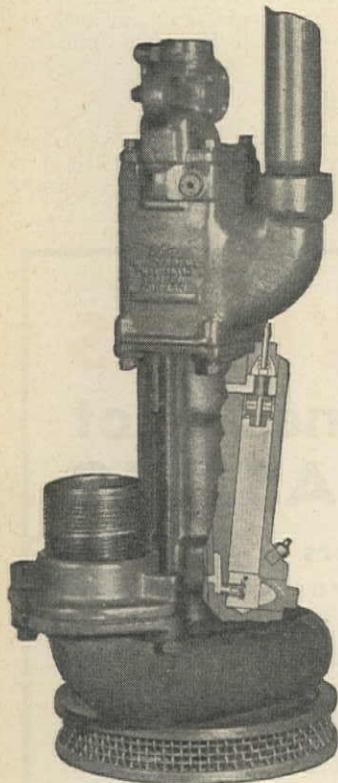
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Thor Sump Pumps are designed to operate efficiently in clean or dirty water; in oil, sludge or sewage—either partially or fully submerged. Your nearby Thor Distributor will gladly demonstrate them as the economical answers to your sump-water problems.



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BRANCHES IN PRINCIPAL CITIES

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PORTABLE POWER
TOOLS

EUREKA CO.—Dodge Construction, Inc., Fallon—\$94,933 for 5.9 mi. pave and seal coat from approx. 10 mi. east of Dunphy to .7 mi. east of Emigrant Summit—by Department of Highways, Carson City. 9-8

WHITE PINE CO.—Hunt & Frandsen, 307 Morrill St., Reno—\$138,557 for 23.9 mi. grade and surf. from junct. with U. S. Hwy. No. 50, approx. 15 mi. east of Eureka to Strawberry—by Department of Highways, Carson City. 9-17

New Mexico

CHAVES CO.—Henry Thygesen & Co., Box 876, Albuquerque—\$235,965 for 6.5 mi. grade and base of Mayhill-Artesia Rd.—by State Highway Department, Santa Fe. 9-9

CURRY CO.—Bowen & McLaughlin, Box 4037, Phoenix, Ariz.—\$524,625 for 8.7 mi. base and surf. of Clovis-Texico Rd.—by State Highway Department, Santa Fe. 9-9

Oregon

JACKSON CO.—Leonard & Slate, 7805 S.W. 40th, Portland—\$132,597 for 4.1 mi. grade of Jackson Creek timber access rd., near Medford—by Public Roads Administration, Portland. 9-17

JEFFERSON CO.—J. L. & C. R. O'Neill, Creswell—\$267,196 for 6.8 mi. grade and bitum. surf. of Juniper Butte-Crooked River sec. of the Dalles-California Hwy.—by State Highway Commission, Salem. 9-8

JEFFERSON AND WASCO COS.—Rogers Construction Co., N.E. 122nd and Glisan, Portland—\$556,415 for 24.7 mi. surf., oil, and regrade of Forest Boundary-Agency Section of Warm Springs Hwy.—by State Highway Commission, Salem. 9-11

LANE CO.—McNutt Bros., 351½ E. Broadway, Eugene—\$109,970 for 17.1 mi. rock surf. and stockpiling, Glove-Elmira Section of Richardson-Eugene Secondary Hwy.—by State Highway Commission, Salem. 9-11

MALHEUR CO.—Leseberg & Stoker, Nyssa—\$126,876 to pave 4 mi. of Nyssa Sts.—by City Council, Nyssa. 9-3

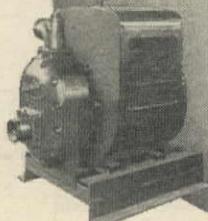
YAMHILL CO.—Leonard & Slate, 7805 S.W. 40th, Portland; O. C. Yocom, McMinnville and J. C. Compton, McMinnville—

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LAKE CITY • DENVER

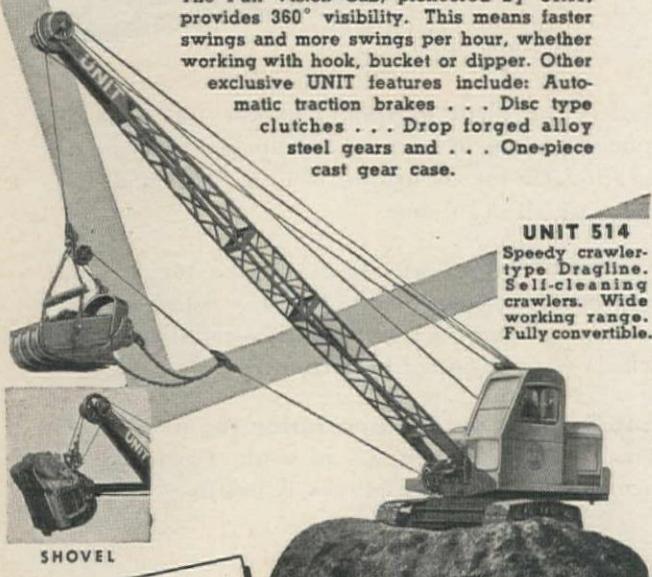
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A 5065-1/2

\$482,917 for 5 mi. grade and pave of Pringle corner-McMinnville section of Salmon River and Pacific West Hwys.—by State Highway Commission, Salem.

9-8

Utah

CACHE CO.—Parsons & Fife Construction Co., Box 563, Brigham City—\$183,541 for 9.2 mi. plantmix bitum. surf. of U. S. Hwy. No. 91, betw. Box Elder Co. line and Wellsville—by State Road Commission, Salt Lake City.

9-19

Washington

LINCOLN CO.—Sather & Sons, 1410 N. Howe St., Yardley—\$125,168 for 7.1 mi. base and surf. of Lome-Munson Rd.—by Department of Highways, Olympia.

9-3

Wyoming

ALBANY CO.—L. T. Johnson, 709 Wall Ave., Ogden, Utah—\$149,121 for 8.5 mi. surf. of Landing-Walden rd.—by State Highway Commission, Cheyenne.

9-12

Bridge & Grade . . .

California

GLENN CO.—Judson-Pacific-Murphy Corp., 4300 Eastshore Hwy., Emeryville—\$228,990 superstruct. for two bridges, one across Sacramento River and other over east branch of Razor Slough, near Butte City—by Division of Highways, Sacramento.

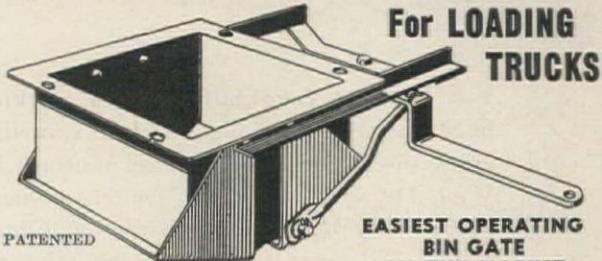
9-26

HUMBOLDT CO.—Guy F. Atkinson Co., 10 W. Orange Dr., South San Francisco—\$347,355 for superstruct. of bridge, and grade and pave approaches, at Weitchpec—by Division of Highways, Sacramento.

9-24

LOS ANGELES CO.—H. B. Nicholson, Chamber of Commerce Bldg., Pasadena—\$419,162 for reinf. conc. bridge and .2 mi. grade

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SAN FRANCISCO 5

and pave, over Los Angeles River at Florence Ave., Bell—by Division of Highways, Sacramento. 9-4

MARIPOSA CO.—E. H. Peterson & Sons, 5691 Dam Rd., Richmond—\$83,826 for six bridges at various locations near Mariposa—by Division of Highways, Sacramento. 9-26

MONTEREY CO.—Dan Caputo, Rt. 1, Box 397, Moorpark Ave., San Jose—\$183,527 for steel beam span overhead crossing over Southern Pacific Co. tracks on Sanborn rd., approx. 2 mi. south of Salinas—by Division of Highways, Sacramento. 9-26

SAN JOAQUIN CO.—Judson-Pacific-Murphy, 4300 Eastshore Hwy., Emeryville—\$416,422 for bridge superstruct. and grade and surf. appr. over San Joaquin River at Mossdale—by Division of Highways, Sacramento. 9-24

YUBA CO.—H. Earl Parker, 12th & F Sts., Marysville—\$96,515 for two reinf. conc. slab bridges and 1.2 mi. grade and pave Ostrom Rd., betw. Plumas School and Rt. 922—by Division of Highways, Sacramento. 9-22

Montana

CUSTER CO.—H. & R. Construction Co., Great Falls—\$166,296 for grade, drain, surf. and three timber bridges on 8.3 mi. of Miles City-Garland rd.—by State Highway Commission, Helena. 9-8

Oregon

KLAMATH CO.—Rogers Construction Co., Rt. 15, Box 526, Portland—\$183,603 for 2 bridges, 3 mi. grade and 14.9 mi. surf. of Bonanza-Poe Valley-Malin Section of Bonanza-Malin County rd.—by State Highway Commission, Salem. 9-8

LANE CO.—R. A. Heintz Construction Co., 8101 N.E. Union St., Portland—\$327,636 for 190-ft. conc. bridge and 5.2 mi. grade and surf., Pleasant Hill-Lost Creek Section of Willamette Hwy.—by State Highway Commission, Salem. 9-11

Utah

BOX ELDER CO.—Whiting & Hammond, Springville—\$118,153 for timber bridge and 7.2 mi. surf. betw. Fielding and East Garland—by State Road Commission, Salt Lake City. 9-19

Washington

COWLITZ CO.—Clark H. Eldridge, Perkins Bldg., Tacoma—\$53,042 for steel and conc. bridge on Secondary State Hwy. No. 1-S, over Rock Creek—by Department of Highways, Olympia. 9-3

YAKIMA CO.—M. P. Munter Co., Joseph Vance Bldg., Seattle—\$128,786 for bridge on Selah rd. connection—by Department of Highways, Olympia. 9-3

Wyoming

BIG HORN CO.—Edlin E. Peterson, 602 E. 15th St., Casper—\$298,804 for four-span bridge over Big Horn river and approx. 1 mi. oil treatment of Greybull-Shell rd.—by State Highway Commission, Cheyenne. 9-12

WASHAKIE CO.—Taggart Construction Co., Box 560, Cody—\$268,816 for five bridges, five culverts and misc. work on approx. 11 mi. of Worland-Raider rd.—by State Highway Commission, Cheyenne.

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CONVEYCO
BATCHERS
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ON-THE-JOB PERFORMANCE shows Conveyco Automatic Batchers Batching 929 cubic yards in a single 8-hour day on the new Highway #99 Freeway at Colton, Calif. A Conveyco Automatic Batcher, 160 Ton Capacity, with Conveyco Bulk Cement Silo, has averaged 665 cubic yards per day (8 hrs.) for a period of 81 "pouring" days. That's fast, profitable operation for concrete highway construction.

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Only one man is needed to operate this fast, accurate batching combination. See these Conveyco partners in action. Automatic or manually operated, Conveyco Weigh Batchers are available ranging in size from 1 to 4 yards. Write for the nearest location where they are operating.



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Water Supply . . .

California

CONTRA COSTA CO.—Haas & Rothschild, Merchants Exchange Bldg., San Francisco—\$503,840 on Alternate B, for constr. of water treatment plant, Antioch—by City Council, Antioch. 9-4

CONTRA COSTA CO.—McGuire & Hester, 796 66th Ave., Oakland—\$89,092 to install approx. 86,000 ft. 36-in. diam. cement-mortar lined pipe and appurtenances and removing pipe in existing Moraga Aqueduct—by East Bay Municipal Utility District, Oakland. 9-2

NAPA CO.—Geo. Slinsen, 2255 Silverado Trail, Napa—\$135,653 for 30,000,000 gal.

earth constr. and conc. lined water reservoir, Napa—by City Council, Napa. 9-4

LOS ANGELES CO.—Macco Corp., 815 N. Paramount Blvd., Clearwater—\$64,784 for sub-surf. underwatering system at steam station, Terminal Island, Long Beach—by Southern California Edison Co., Long Beach. 9-12

SAN DIEGO AND RIVERSIDE COS.—Edward Green, 3001 Coolidge Ave., Los Angeles—\$287,359 for 16-in. water line, San Jacinto-San Vincente Aqueduct, betw. Rainbow and Fallbrook—by County Water Authority, San Diego. 9-5

SAN DIEGO CO.—Western Pipe & Steel Co., 5717 S. Santa Fe Ave., Vernon—\$67,500 for 2,000,000-gal. water reservoir, to be located approx. 1.5 mi. south of El Cajon—by La Mesa, Lemon Grove & Spring Valley Irrigation District, La Mesa. 9-12



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ARMCO Corrugated Metal Pipe is light in weight yet has ample strength to take all your sewer jobs in stride.

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ARMCO SEWER PIPE



Sewerage . . .

California

ALAMEDA CO.—D. J. Bressi, 305 Linden Ave., South San Francisco—\$72,205 for sanitary sewers, pump station and force main, Niles—by City Sanitary District, Niles. 9-23

ALAMEDA CO.—J. Henry Harris, 2657 9th St., Berkeley—\$161,135 for Unit No. 1, 14th Ave. Sewage Separation project, E. 14th St. south, Oakland—by City Council, Oakland. 9-25

ALAMEDA CO.—W. C. Smith, Inc., 2119 Pacific Blvd., Long Beach—\$330,724 for storm drain pump station, to contain 7 pumps, Long Beach—by City Council, Long Beach. 9-22

CONTRA COSTA CO.—Tom L. Gogo, 1024 S. Figueroa St., Los Angeles—\$428,769 for main trunk sewer from treatment plant north of Pacheco to south of Walnut Creek—by Central Contra Costa Sanitary District, Walnut Creek. 9-22

LOS ANGELES CO.—Artukovich Bros., 7320 N. Atlantic Ave., Hynes—\$84,399 to install sanitary sewers in Donovan and other Sts.—by County Board of Supervisors, Los Angeles. 9-2

LOS ANGELES CO.—Bosko Construction Co., 3727 Eagle St., Los Angeles—\$66,305 for sanitary sewers in Farmdale Ave. and Sylvan St. Sewer District, Los Angeles—by City Board of Public Works, Los Angeles. 9-12

LOS ANGELES CO.—Mike Radich & Co., 3000 Empire Ave., Burbank—\$63,835 for storm drain and appurtenances to serve Fox Hills Dr., Beverly Glen Blvd., Almayo Ave., and Pico Blvd., Los Angeles—by City Board of Public Works, Los Angeles. 9-2

SAN MATEO CO.—Manuel Smith, Syndicate Bldg., Oakland—\$180,645 for sewage treatment plant and outfall sewer, Sharp Park—by City Sanitary District, Sharp Park. 9-12

SANTA BARBARA CO.—Fred J. Early, Jr., Co., 369 Pine St., San Francisco—\$211,553 for additions and alterations to existing sewage treatment plant, Santa Maria—by City Council, Santa Maria. 9-8

Washington

CLARK CO.—Gaasland Co., Inc., 1161 Ellis St., Bellingham—\$359,605 for sewage treatment plant at Vancouver—by City Council, Vancouver. 9-22

OKANOGAN CO.—Joe Lundberg, Seattle—\$104,975 for sewage treatment plant, Okanogan—by City Council, Okanogan. 9-18

OKANOGAN CO.—W. L. Ridge, Spokane—\$106,067 to lay sewer pipe line in Okanogan—by City Council, Okanogan.

Waterway . . .

California

LOS ANGELES CO.—Smale & Robinson, Inc., 1033 Avalon Blvd., Wilmington—\$179,500 for clearing of wharf site and constr. of new timber oil wharf, Berths 167-168, Mormon Island, Wilmington—by Harbor Commission, Los Angeles. 9-25

SUTTER AND BUTTE COS.—Morrison-Knudsen Co., Inc., Crocker First

National Bank Bldg., San Francisco — \$173,989 for Sutter-Butte canal headgates, west levee of Feather River—by Corps of Engineers, Sacramento. 9-22

Washington

SNOHOMISH CO.—Puget Sound Bridge & Dredging Co., 2929 16th Ave., S.W., Seattle—\$75,000 to dredge 385,000 cu. yd. of silt near Fourteenth St. fill project, Everett—by City Port Commission, Everett. 9-3

THURSTON CO.—Puget Sound Bridge & Dredging Co., 2829 16th Ave., S.W., Seattle—\$67,150 for approx. 170,000 cu. yd. maintenance dredging, Olympia Harbor—by Corps of Engineers, Seattle. 9-22

Canada

BRITISH COLUMBIA—Highway Construction Co., Ltd., 789 W. Pender St., Vancouver — \$156,400 to reconstr. West Indies wharf and repl. conc. sub-struct. and floor of shed No. 2 at Lapointe pier, Vancouver—by National Harbors Board, Vancouver. 9-19

Dam . . .

California

LOS ANGELES CO.—Guy F. Atkinson Co., Box 259, Long Beach—\$694,385 for constr. of 16 hydraulic oper. slide gates, communication system, etc., Santa Fe dam outlet works, Los Angeles—by Corps of Engineers, Los Angeles. 9-8

North Dakota

MCLEAN CO.—S. K. Jones, Memphis, Tenn.; H. N. Rogers & Sons Co., Memphis, Tenn., and Forcum James Co., Dyersburg, Tenn. — \$6,349,835 for excav. and main embank., Stage 1, Garrison Dam, near Riverdale—by Corps of Engineers, Ft. Lincoln. 9-24

Washington

WHATCOM CO.—General Construction Co., 3840 Iowa St., Seattle; Morrison-Knudsen Co., Inc., Box 450, Boise, Idaho; and J. F. Shea Co., 617 Olive St., Los Angeles, Calif. — \$5,298,965 to complete third step of Ross Dam, across Skagit River—by Seattle Board of Public Works, Seattle. 9-12

Wyoming

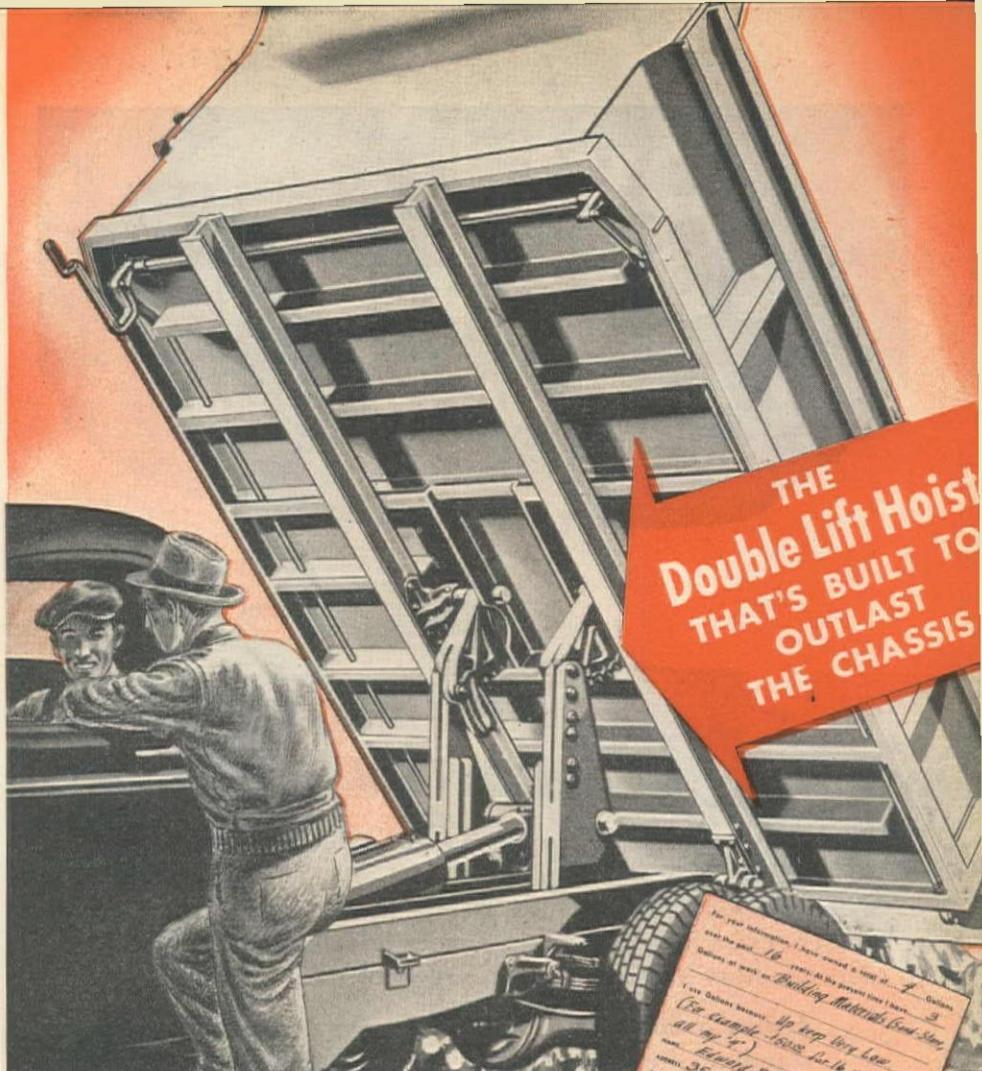
HOT SPRINGS CO.—Morrison-Knudsen Co., Inc., Box 450, Boise, Idaho—\$13,899,999 for constr. of Boysen Dam, power plant and relocation of Chicago, Burlington & Quincy Railroad, approx. 18 mi. south of Thermopolis—by Bureau of Reclamation, Thermopolis. 9-8

Irrigation . . .

Idaho

CANYON CO.—Henry L. Horn, Caldwell—\$69,555 for 'C' line canal west laterals 1.6 to 23.5 and sublaterals Payette Division, Boise Project, approx. 11 mi. north of Caldwell — by Bureau of Reclamation, Boise. 9-22

MINIDOKA CO.—Duffy-Reed Construction Co., Twin Falls — \$91,670 to build canals on Minidoka project—by Bureau of Reclamation, Boise. 9-16



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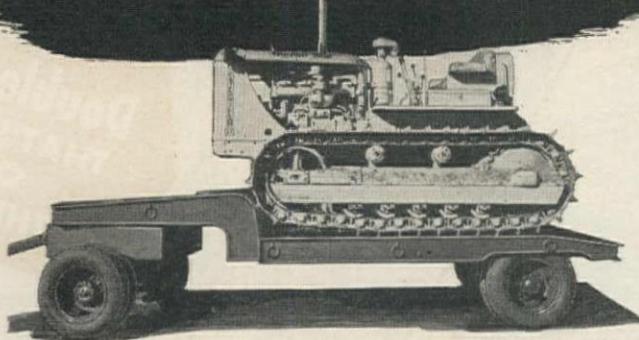


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4 sizes available. The 10-15 tonner is available in four standard sizes. Bed widths are 8' or 8'6" with optional loading deck lengths of 8' or 10'. Overall length of the semi trailer is 19'6" and 27'3" for the full trailer.

Strong unitized construction includes a gooseneck which is an integral part of the frame. Electrically welded into one solid unit, the scientifically engineered frame distributes the load over all frame members—reduces center point strain—assures a lowbed which can take reasonable overloads without weakening.

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Tunnel . . .

Oregon

DOUGLAS CO.—L. E. Dixon Co., 409 So. California, San Gabriel—\$1,056,750 for reinf. conc., 12-ft. diam. and approx. 6,000-ft. long tunnel, first phase of \$4,000,000 power program, Toketee—by Public Engineering Service Corp., Chicago, Ill. 9-2

Power . . .

New Mexico

SIERRA AND SOCORRO COS.—Reynolds Electric Co., El Paso, Tex.—\$356,859 for 115-kv., 3-phase, 60 cycle single circuit transmission line, Elephant Butte-Socorro—by Bureau of Reclamation, Denver, Colo. 9-4

Building . . .

Arizona

GREENLEE CO.—R. E. Bruce, Rt. 1, Box 76, Phoenix—\$324,100 for shopping center, and theater at Morenci—by Phelps Dodge Copper Products Corp., Morenci. 9-12

MARICOPA CO.—R. B. McKenzie, 1132 E. Portland St., Phoenix—\$99,400 for 8-classroom, brick school bldg., at 10th St. and Forest Ave., Tempe—by City School Board, Tempe. 9-12

California

ALAMEDA CO.—Mark Bristol, 1973 Oakcrest Dr., Oakland—\$106,287 for 6-classroom, frame and stucco school bldg., Castro Valley near Hayward—by Castro Valley School District, Castro Valley. 9-10

ALAMEDA CO.—Willis F. Lynn, 1040 Folger Ave., Berkeley—\$679,600 for conc. and steel, four-story labor temple, 23rd and Valderos Sts., Oakland—by County Labor Temple Assn., Oakland. 9-3

ALAMEDA CO.—Swinerton & Walberg, 225 Bush St., San Francisco—\$232,350 for three, one-story, frame and stucco college bldgs., Concordia College, 64th Ave. and Brann St., Oakland—by Evangelical Lutheran Synod, Oakland. 9-19

CONTRA COSTA CO.—Shumaker & Evans Construction Co., 3974 Wilshire Blvd., Los Angeles—\$394,400 for apartment housing project composed of 8, two-story, 8-unit apartment bldgs., Richmond—by Parr-Richmond Homes, Inc., San Francisco. 9-12

FRESNO CO.—Harris Construction Co., Box 109, Fresno—\$271,362 for frame and stucco, pentagon shaped at center with open patio, farmers market bldg., 4 acres bounded by Tulare, Divisadero and 'U' Sts., Fresno—by Fresno Farmer's Market, Inc., Fresno. 9-11

KERN CO.—Haddock-Engineers, Ltd., Box 479, Oceanside—\$3,187,259 for 380 dwellings and facilities, Naval Ordnance Test Station, Inyokern—by Bureau of Yards & Docks, Washington, D. C. 9-5

KERN CO.—Guy E. Hall, 1326 30th St., Bakersfield—\$525,000 to convert 165 bldgs. to housing units, Minter Field, Bakersfield—by County Housing Authority, Bakersfield. 9-16

KERN CO.—William Radkovich Co., 4290 E. Washington Blvd., Los Angeles—\$949,714 for 69 married officers' dwellings, Naval Ordnance Test Station, Inyokern—by Bureau of Yards & Docks, Washington, D. C. 9-10

LOS ANGELES CO.—Guy F. Atkinson Co., Box 259, Long Beach—\$1,916,667 for main bldg. superstruct. for units 3, 4 and 5, Harbor Steam Plant, Island Ave. and B St., Wilmington—by Department of Water and Power, Los Angeles. 9-15

LOS ANGELES CO.—Brunzell Construction Co., 3945 Higuera St., Culver City—\$597,532 for erection of temporary bldgs. at East Los Angeles Junior College, 5027 E. 6th St., Los Angeles—by Board of Education, Los Angeles. 9-26

LOS ANGELES CO.—R. E. Campbell, Box 3186, Terminal Annex, Los Angeles—\$1,500,000 for five-story addition to existing three-story hospital bldg., Long Beach—by Directors of St. Mary's Hospital, Long Beach. 9-17

LOS ANGELES CO.—The Eastern Construction Co., 615 E. First St., Long Beach \$2,000,000 for Class A, 12-story, apartment bldg., northeast corner of First St. at Atlantic Ave., Long Beach—by Claborne Construction Co., Long Beach. 9-19

LOS ANGELES CO.—Fred E. Potts Co., 2516 12th Ave., Los Angeles—\$225,000 for reinf. conc., one-story, mezzanine and basement, office bldg., 451 N. Bedford Dr., Beverly Hills—by First Federal Savings & Loan Association, Los Angeles. 9-4

LOS ANGELES CO.—L. S. Whaley Co., 4439 Atlantic Ave., Long Beach—\$500,000 for 100, frame and stucco, 2 and 3 bedroom dwellings at Bellflower Blvd. and Sterns Ave., Long Beach—by self. 9-12

SACRAMENTO CO.—Jansen Construction Co., 1923 Stockton Blvd., Sacramento—\$510,000 for 20 5½-room dwellings and 50 4½-room dwellings, Freeport Park, Oregon, Avilla and Shirley Drives—by self. 9-2

SACRAMENTO CO.—H. W. Robertson, 2917 T St., Sacramento—\$297,686 for frame and stucco grade school bldg., 2000 13th St., Sacramento—by North Sacramento School District, Sacramento. 9-3

SAN BERNARDINO CO.—Robert E. McKee, 4700 San Fernando Rd., Los Angeles—\$372,000 for reinf. conc., one-story and basement, struct. steel store bldg., corner of 5th and 'E' Sts., San Bernardino—by J. C. Penney Co., Los Angeles. 9-4

SAN FRANCISCO CO.—M. & K. Corp., Financial Center Bldg., San Francisco—\$991,890 for reinf. conc. and steel Class A, 2-story and basement recreation bldg., Fremont and Harrison Sts., San Francisco—by Sailor's Union of the Pacific, San Francisco. 9-24

SAN FRANCISCO CO.—Stone & Webster Engineering Corp., Russ Bldg., San Francisco—\$1,870,000 for two-story, reinf. conc. and struct. steel power generating plant addition, Evans Ave. at Jennings St., Hunters Point, San Francisco—by Pacific Gas & Electric Co., San Francisco. 9-8

SAN MATEO CO.—Martinelli Construction Co., 44 Mary St., San Francisco—\$117,450 for first unit of elementary school, Bayshore—by Bayshore Elementary School District, Bayshore. 9-12

SANTA CLARA CO.—Bechtel Construction Co., 220 Bush St., San Francisco—\$420,000 for steel and corr. iron warehouse at southwest corner Kiefer Rd. and Santa



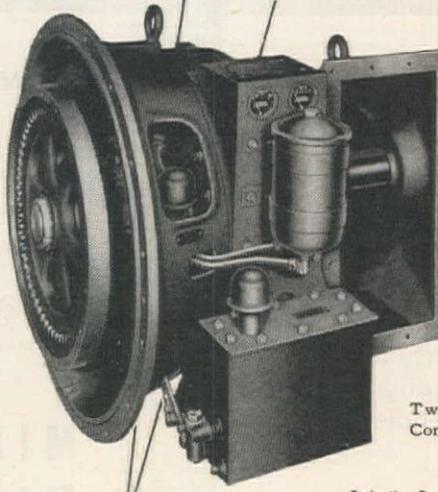
**MORE PUSH...
MORE PULL...
More Yardage Moved**

Shown bulldozing heavy shale on U. S. 27 near Alexandria, Ky., is the new Allis-Chalmers HD19 Tractor equipped with a Twin Disc Torque Converter.

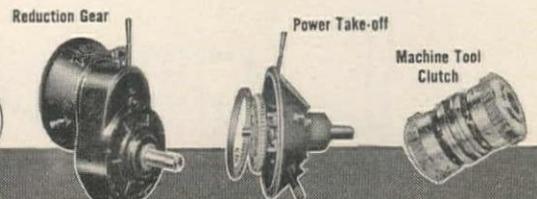
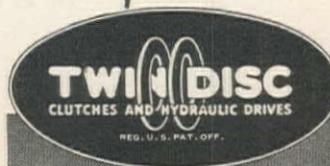
Tractors equipped with Twin Disc Hydraulic Torque Converters are moving 20% more yardage than conventional tractors at one-half the upkeep cost. These Twin Disc units are designed for use wherever it is advantageous to multiply torque for constantly-changing speed and load requirements.

Continuous smooth operation in starting, pushing, and pulling is assured with a Twin Disc Torque Converter. There is uninterrupted acceleration... less operator fatigue. Time and momentum of the load are not lost in shifting gears, thus increasing the yardage moved.

Proved in a wide variety of applications... tractors, cranes, hoists, yarders and loaders... Twin Disc Hydraulic Torque Converters deliver smooth power, make accurate control possible, and prevent stalling. Write the Hydraulic Division for Bulletin No. 135-B. **TWIN DISC CLUTCH COMPANY**, Racine, Wisconsin (Hydraulic Division, Rockford, Ill.).



Twin Disc Hydraulic Torque Converter (Lysholm-Smith type).



SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

Clara-Alviso Rd.—by Owens-Corning Fiberglass Corp., Toledo, Ohio. 9-29

SANTA CLARA CO. — Judson-Pacific-Murphy, 4300 Eastshore Hwy., Emeryville — \$140,000 for struct. steel constr., motor plant, Monterey Rd., San Jose—by General Electric Co., San Francisco. 9-22

SANTA CLARA CO.—Wagner & Martinez, 181 S. Park, San Francisco—\$300,000 for two-story, conc., fire-resistant dormitory bldg., Crothers Hall, Galvez St., Stanford University—by Board of Regents, Stanford University, Palo Alto. 9-25

STANISLAUS CO. — Walter Lenkeit Construction Co., 2225 Revere St., San Francisco—\$55,324 for sewer lines, central plant and outfall sewer, Modesto—by City Council, Modesto. 9-26

TULARE CO.—Ralph Utter, 525 Cherry Ave., Tulare—\$185,000 for telephone exchange bldg., Tulare — by Pacific Telephone & Telegraph Co., San Francisco. 9-4

Colorado

WELD CO.—Brown-Schrepfman & Co., 240 Washington St., Denver—\$233,674 for excav. and substruct. for 200-bed hospital at Greeley—by County Public Hospital Assn., Greeley. 9-8

Idaho

PAYETTE CO.—C. B. Lauch Construction Co., Box 2559, Boise—\$500,000 for shore lodge project at Payette Lakes—by Shore Lodge, Inc., Payette Lakes. 9-12

Nevada

WASHOE CO.—J. A. Bryant Co., 815

Capitol St., Vallejo, Calif.—\$155,878 for Naval Reserve Armory Bldg., Reno—by Bureau of Yards & Docks, Washington, D. C. 9-10

WASHOE CO.—Shumaker & Evans Construction Co., 3974 Wilshire Blvd., Los Angeles—\$1,200,000 for one- and part two-story, 100 room, cement block and frame El Rancho Hotel, on 9-acre site at 2505 S. Virginia Rd., Reno — by Thomas Hull Enterprises, Hollywood, Calif. 9-11

Oregon

MARION CO.—W. C. Smith, Inc., Board of Trade Bldg., Portland—\$724,740 for laundry bldg., ward and employees cottage at Fairview Homes, Salem—by State Board of Control, Salem. 9-29

MARION CO.—W. C. Smith, Inc., Board of Trade Bldg., Portland — \$208,994 for three-unit employees dormitory, Fairview Home, Salem — by Board of Control, Salem. 9-16

MULTNOMAH CO.—Bingham Construction Co., 437 N.E. 11th, Portland—\$150,000 for warehouse and office bldg., Portland—by California Bag & Metal Co., San Francisco. 9-13

Utah

SALT LAKE CO.—Ben H. Davis, Interurban Depot Bldg., Salt Lake City—\$450,000 for 64 unit apartment bldg., First S., bet. 11th and 12th Sts., Salt Lake City—by Capson-Bowman, Inc., Salt Lake City. 9-22

WEBER CO.—M. Morrin & Sons, 1448 23rd St., Ogden—\$126,050 for Naval Re-

serve Armory, Ogden — by Bureau of Yards & Docks, Washington, D. C. 9-4

Washington

KING CO. — Olympic Designers and Builders, 501 Valley St., Seattle—\$213,190 to remodel school bldg. and build addition, Brighton School, Seattle—by State Department of Education, Olympia. 9-1

PIERCE CO.—Roy T. Earley Co., 321 Middle Water Way, Tacoma—\$140,794 for conc. grandstands at Lincoln high school bowl, Tacoma—by City School Board, Tacoma. 9-2

SNOHOMISH CO.—Odegard Construction Co., 2417 Hewitt Ave., Everett—\$285,000 for reinf. conc., 2-story and basement telephone bldg., Everett and Wetmore Aves., Everett—by West Coast Telephone Co., Everett. 9-12

YAKIMA CO. — William McCulloch, Yakima—\$140,000 for 8-room addition to Wide Hollow school, Yakima—by County Board of Supervisors, Yakima. 9-12

Wyoming

NATRONA CO.—Exby-Snyder Building Corp., Cheyenne—\$190,000 for constr. of foundation of 28-unit brick apartment bldg. at Third and McKinley Sts., Casper—by self. 9-17

Canada

BRITISH COLUMBIA — Commonwealth Construction Co., Ltd., 670 Taylor St., Vancouver—\$240,000 for 50 dwellings at Prince George—by Central Mortgage & Housing Corp., Vancouver. 9-19

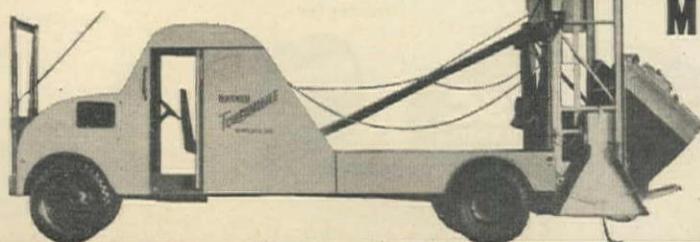
SHORT ON TIME? LONG ON WORK?

PUT

TOWERMOBILE

ON THE JOB

Towermobile can be driven right to the job—tower can be raised or lowered mechanically—concrete pouring can commence! It's as simple as that! No valuable time lost in rigging up hoists or towers which later have to be torn down. Standard tower height is 45 ft. with one 10 ft. extension. Elevating bucket is interchangeable with a 6' x 6' platform for hoisting other building material.



ONE MAN

can set Towermobile up for operation in 15 to 30 minutes . . . hoist and pour concrete up to 50 yards per hour.

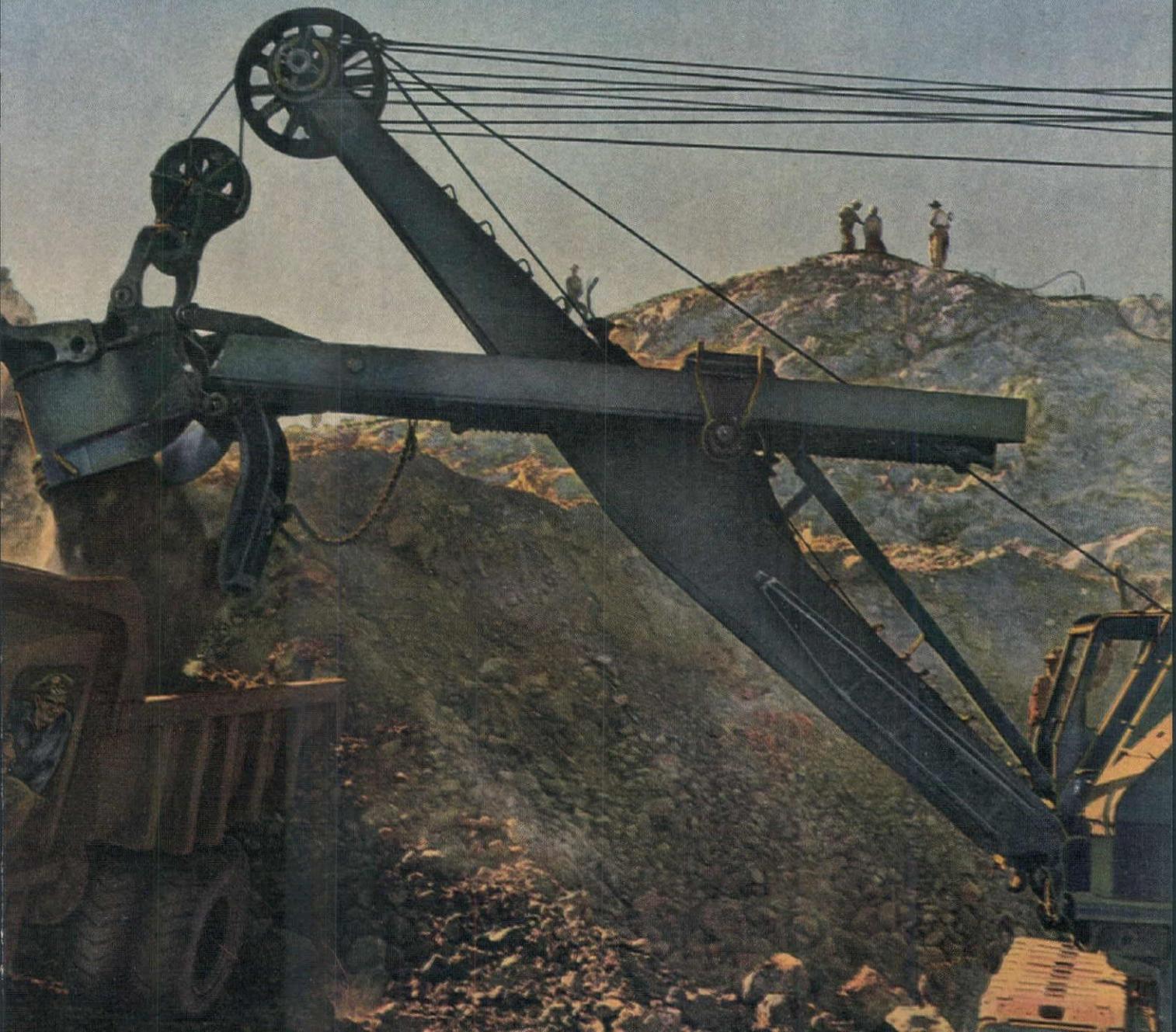
Write Dep't WC for complete information and name of your nearest dealer.

**MIXERMOBILE
MANUFACTURERS**

6855 N. E. HALSEY STREET
PORTLAND 16, OREGON



PACIFIC WIRE ROPE COMPANY
LOS ANGELES 21, CALIF., U.S.A. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND



TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

New name and corporate ownership for the RUCKER COMPANY of Oakland were announced recently by **Clark E. Rucker**, owner. Formerly Rucker Vaughn Co., the firm will operate henceforth as the Rucker Company. Rucker bought the interest of **C. S. Vaughn** and is now sole owner. With the change of name, the company is also expanding its operations into

the sales and distribution of hydraulic as well as pneumatic equipment. The firm was recently appointed representative for the Hanna Engineering Co. of Chicago, Ill. Among lines now handled are cylinders and valves, compressors, regulators, lubricators, filters, drill presses, hoists, radial drills and saws, multiple drill heads, electric motors and drives. Newly appointed to the organization is **George H. Wilson** who will be sales manager. Prior to his

connection with the Rucker Company, Wilson was sales manager of Modernair Corp., and plant manager for Sperry Gyroscope before the war.

☆ ☆ ☆

Leon M. Leavick, safety engineer for the E. D. BULLARD COMPANY, San Francisco, died August 30.

☆ ☆ ☆

BAY CITIES EQUIPMENT, INC., Oakland, are now distributors for the KOEHRING COMPANY, Milwaukee, Wis., in northern and central California. The company, formerly connected with MOORE EQUIPMENT, Stockton, handles Koehring shovels, cranes and draglines, Dumptors, twinbatch pavers, Parsons, Trenchliners, Kwik-Mix concrete, plaster and bituminous mixers as well as Johnson concrete plants, roadbuilders' bins and batcher and clamshell buckets.

☆ ☆ ☆

John Fies, well known in building code work in the Southwest, is representing the Technical department of the NATIONAL LUMBER MANUFACTURERS ASSOCIATION on the Pacific Coast, it was announced by **R. A. Colgan, Jr.**, executive vice-president of the association. Fies, who served in the army with the rank of major, was building code specialist for the National Housing Agency in the southwestern area following his discharge. He is a registered professional engineer in the state of Texas.

☆ ☆ ☆

Allan J. Anderson, who became associated with the AMERICAN POTASH & CHEMICAL CORPORATION in November, 1923, is the new manager of the plant at Trona, Calif., succeeding **Walter J. Metzger**, who resigned. He joined the company staff as a research chemist, later becoming general foreman, production manager, and then assistant Trona manager in 1946.

☆ ☆ ☆

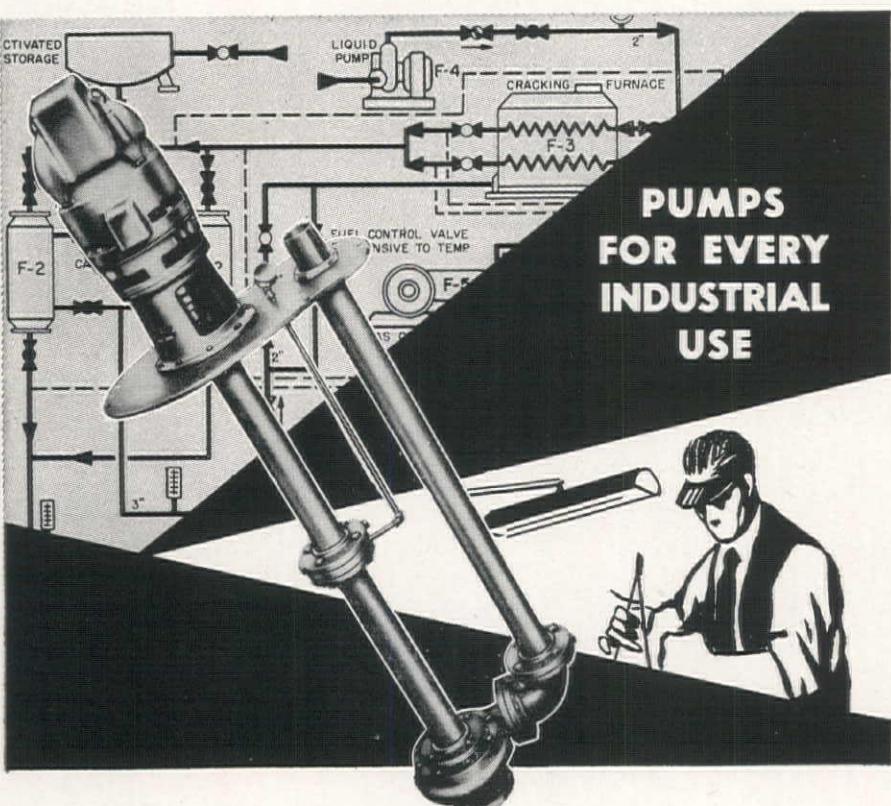
Appointment of the BAY EQUIPMENT COMPANY, Richmond, Calif., as exclusive northern California distributor of WORTHINGTON PUMP AND MACHINERY CORPORATION was announced recently by the Construction Equipment division of Worthington. The Bay company, owned and organized by **R. W. Christofferson** and **Ray D. Smith**, will handle a complete line of Worthington portable air compressors, air tools, and accessories. **John V. Jorgenson**, manager of the Air division, is in charge of all sales and rentals.

☆ ☆ ☆

S. I. Harris has been named manager of the Sacramento branch of SOULE EQUIPMENT COMPANY with complete charge of sales and service for the Soule lines. Harris was formerly western sales manager for LaPlant-Choate, a sales representative for John Deere and Union Oil Company, and more recently represented Soule in the Fresno territory.

☆ ☆ ☆

A net profit amounting to \$3,241,879.09 was earned by THE PARAFFINE COMPANIES, INC., for the fiscal year ending June 30, 1947, as compared to \$1,014,547.57 in the previous fiscal year. Net profit for the fiscal year ending June 30, 1946, it was pointed out in the report, was adversely affected by an area-wide strike of the East



Behind the scenes in every industrial plant, pumps of all kinds play a very major role in the overall operation. It is extremely important therefore to make sure that the pumps which are used are engineered to give years of unfailing service. Every pump bearing the trademark of Pacific Pumping Company is unconditionally guaranteed. Over forty years of experience in pump engineering is your assurance that when you choose a Pacific Pumping Company pump you will receive a pump that is correctly engineered for the job that it is designed to do. We invite you to talk your pumping requirements over with our pumping engineers.



ESTABLISHED 1907

PACIFIC PUMPING CO.

profit for the fiscal year just past includes dividends received from FIBREBOARD PRODUCTS, INC., amounting to \$713,719.

☆ ☆ ☆

Establishment of a new wholesale depot for service parts at Richmond, Calif., was announced recently by the INTERNATIONAL HARVESTER COMPANY. The new unit is one of eleven, and will provide faster, more complete service to dealers and company branches in California, lower Oregon and Arizona. New depot will occupy a 228,000-sq. ft. warehouse which is being leased for a 20-year period. Lease was negotiated by Fred D. Parr, president of the Parr-Richmond Terminal Co., who leased the land, and E. J. Stokes, manager of International Harvester's real estate department.

☆ ☆ ☆

Karl Burlie, district manager of SCHRAMM, INC., announces the appointment of SHAW SALES & SERVICE COMPANY, 5100 Anaheim-Telegraph Road, Los Angeles, as their distributors for the contractors and construction field in the southern California area. **Beal Shaw**, president of Shaw, states that a complete line of Schramm air compressors and pneumatic tools will be carried in stock for sale and rental. Parts and repair service will also be available in their three stores located in Los Angeles, San Diego, and Santa Barbara. The Shaw Company represents a number of nationally known road machinery and construction equipment manufacturers.

☆ ☆ ☆

A. K. Tice has been selected as manager for the new factory branch of the FRUEHAUF TRAILER COMPANY now under construction at Sacramento. Tice joined the Fruehauf organization as manager of the branch at St. Paul, Minn., in 1935, was transferred to the Detroit office in 1942, and since the termination of hostilities has been associated with the sales department in an executive capacity. The Sacramento branch is scheduled for completion at an early date. It occupies a twelve-acre site on the Davis Highway with 30,000 sq. ft. of floor space under roof.

☆ ☆ ☆

Purchase of the TURNER MACHINERY COMPANY of San Francisco, manufacturers of band sawing equipment, by UNITED ENGINEERING COMPANY has been announced jointly by Commodore L. F. Small of United and W. B. Turner, president of the machinery company. United will continue production and sales of Turner machines and distribution of other machinery lines represented by Turner. Personnel, tools, and other facilities will gradually be transferred from the Turner plant on Folsom Street to United's Beale Street headquarters.

☆ ☆ ☆

C. J. Colman, San Francisco, is the newly appointed general assistant to vice-president **A. J. Stream** of the PLANT RUBBER AND ASBESTOS WORKS, San Francisco, according to announcement by **R. H. Chase**, vice-president and general manager. Colman, who has been with the



Knocks the Socks off PAVING COSTS!

This revolutionary new development in Municipal Paving Units has definitely proved that it can place perfectly upwards of **65 cubic yards of concrete in a single hour!**

FURTHERMORE, IT EMPLOYS

THE ONLY SCREED THAT WILL:

1. Undercut at side forms.
2. Roll back for second pass.
3. Strike-off crowns, both regular and inverted.
4. Permit operators to work from front, rear or sides.

In addition, the screed has such a strong tendency to propel itself in the forward direction that only small effort is necessary to strike-off stiff mixes of concrete. Manholes and storm sewers are no handicap due to the fact the screed does not reciprocate. Does an excellent job of vibrating concrete in slab depths up to 10 inches. Can be used to great advantage on any slab width from 6' on up to any practicable width. For radically reduced costs and far greater production, by all means write for complete details of this remarkable paving unit **RIGHT NOW!**

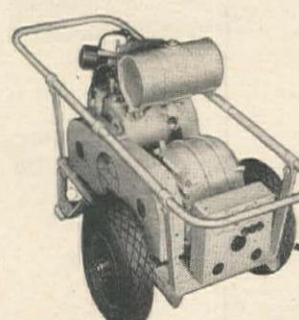
The COMPLETE UNIT CONSISTS OF:

1 The Model SC200 Screed (for slabs up to 16' wide) or Model SC202 (for slab widths from 16' and up) — activated by the famous JACKSON Vibratory motor. Light weight, easily transported — quickly converted from one slab width to another.

2 One of our famous Portable Power Plants which provide a wide range of vibratory frequencies thus assuring perfect placement of any concrete mix usually specified. These husky plants are Wisconsin engine powered and have permanent magnet generators which require no adjustment or maintenance.

MODEL M-1 POWER PLANT

furnished with Model SC200 Screed. Capacity: 1.25 K.V.A. Generates both single phase and 3-phase 110 Volt 60 Cycle AC. Also ideal for operating lights, vibrators and power tools.



ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON **MICHIGAN**

company for 18 years, advanced to his present post from order clerk to marine department salesman to office manager. The company has factories at San Francisco, Redwood City, and Emeryville. They are leading manufacturers and distributors of high temperature insulating materials and mechanical packings.

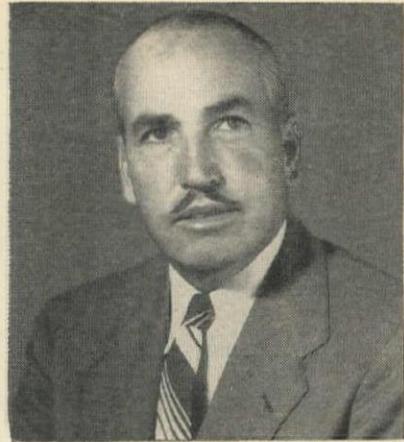
★ ★ ★

Addition of three new sales and service engineers to work with industry was announced recently by KINGWELL BROS. LTD., San Francisco, manufacturers of Kingwell Bronze Bearings. **Edward L. Unger** has been appointed to the southern California industrial area, working with the ALMQUIST BROTHERS, Kingwell distributors at Los Angeles, while **Tore Franzen** will serve the San Francisco Bay Area.

Northern California industry will be served by **William McFate**, who was previously associated with the UNION STEEL CASTING CO., Pittsburgh, and with the CARNEGIE-ILLINOIS STEEL CO., Youngstown, O. Both McFate and Franzen will work in cooperation with northern California distributors for the company: INDUSTRIAL BEARINGS, INC., San Francisco and Oakland; MASTERSON BEARING CO., San Jose; THE BEARING HOUSE, Sacramento; BEARING SUPPLY, Stockton; and KYLE & CO., Stockton and Fresno.

★ ★ ★

A branch warehouse, sales office and showroom was opened recently in Long Beach, Calif., by the GRINNELL COMPANY, manufacturer and national distrib-



utor of piping products and automatic sprinkler fire protection. Located at 1360 West Pacific Coast Highway, the building is 15,000 sq. ft., plus 25,000 sq. ft. of pipe yard and outside storage. Manager of the new branch is **W. F. "Bill" Cook**, sales engineer at the company's Los Angeles branch since 1938.

★ ★ ★

Establishment of a new wholesale depot for service parts at Richmond, Calif., was announced recently by the INTERNATIONAL HARVESTER COMPANY, Chicago, Ill. Faster, more complete service to dealers and company branches in California, lower Oregon and Arizona will be provided by the new depot, one of eleven such units being created in the United States, according to **Merger Lee**, vice-president in charge of supply and inventory. Operation of the depot, leased for a 20-year period from the Parr-Richmond Terminal Co., is expected to begin about May 1, 1948.

★ ★ ★

PACIFIC NORTHWEST

I. K. Ackmann has been transferred from Indianapolis, Ind., to Seattle where he will serve as the factory representative for the INSLEY MANUFACTURING CORP. in the Pacific Northwest. He will make his headquarters at the offices of the STAR MACHINERY CO., recently appointed distributor for Insley products.

★ ★ ★

New headquarters at 1925 N. W. Quimby St. was announced recently by **Thomas D. Taylor**, manager of the FREIGHTLINER CORPORATION, Portland, Ore. The organization, formerly a Utah firm, was incorporated in Oregon in January. Taylor, who managed the firm in Utah before the war, returned to the company a year ago following his separation from the service.

★ ★ ★

SPOKANE UTILITY SUPPLIES CO. has completed construction of a 5,000-sq. ft. concrete warehouse adjacent to railroad facilities and yard storage space. The newly organized firm, headed by **Frank Miller** as president, will be the first water works supply company in eastern Washington.

★ ★ ★

CONCRETE PIPE & PRODUCTS ASSOCIATION held its 19th annual fall meeting at the Construction Center auditorium in the Arctic Building, Seattle. Following a morning business meeting and a noon luncheon at the Engineers' Club, a program dealing with two subjects and discussion took place. **William R. Mason**

HANDLING 37½ TON GIRDER with 2 BAY CITY CRANE MOBILE at operation crossroads



Lifting 37½ ton girder from trailer



Hoisting into place



Setting girder into position

Objective: to hoist 2 girders—each 113 ft. long and weighing 37½ tons—into position on concrete piers to conduct Edge Hill Rd. across "Old York Road" in Abington Twp., Bucks County, Pa.

Here's how the operation was completed—in just 30 minutes! Two BC Crane-Mobiles with 40 ft. booms, owned and operated by Bucks County Construction Co. of South Langhorne, Pa., teamed up on each girder, hoisting it from trailer to pier. The result: a big job completed in minimum time, with minimum effort, and minimum disruption of main highway traffic. For complete facts on BC Cranes and CraneMobiles, see your nearest dealer or write direct.

BAY CITY

SHOVELS • DRAGLINES • CRANES • HOES • CLAMSHELLS

BAY CITIES SHOVELS, INC., Bay City, Michigan

LOS ANGELES 11, Calif.—Brown-Bevis Equipment Co., Box 174 Vernon Sta.

SAN FRANCISCO 3, CALIF.—Garfield & Company, 1232 Hearst Bldg.

PORTLAND 14, ORE.—Feenaughty Machinery Co., 112 S.E. Belmont St.

SEATTLE 4, WASH.—1028 Sixth Ave., S.

BOISE IDAHO—600 Front St.

SPOKANE, WASH.—N. 715 Division St.

BUTTE, Mont.—B. M. Fletcher, 219 E. Park St.

SALT LAKE CITY 1, UTAH—C. H. Jones Equipment Co., 236 W. South Temple St.

CASPER, WYO.—Studer Tractor & Equipment Co., E. Yellowstone Highway

DENVER 17, COLO.—Held & McCoy Machinery Co., 3201 Brighton Blvd.

136

WESTERN CONSTRUCTION NEWS—October, 1947

of the University of Washington engineering faculty reported results of the three-edge bearing versus sand bearing methods of testing concrete pipe, and Bailey Tremper, materials and research engineer for the Washington state highway department discussed the test results. Verne Freese, LAYRIGHT CONCRETE PRODUCTS, Seattle, and Paul P. Clemens, Portland, discussed the proper handling of pumice building blocks and the advantages in their use.



Maurice Hooff, 47, general production manager of the HYSTER COMPANY, Portland, Ore., and a well-known heavy machinery production man, died August 22 in Portland. He had been connected with the company, manufacturers of tractor equipment and industrial trucks,

since its inception, and had been in charge of production at the three Hyster factories, Portland, Ore., Peoria and Danville, Ill., for the past few years.

☆ ☆ ☆

STAR MACHINERY CO., Seattle, has been appointed as distributor in western Washington for the INSLEY MANUFACTURING CORP., makers of the $\frac{1}{2}$ -yd. Insley power shovel. Complete facilities for sales and service of Insley products have been installed according to Jack Hatton, construction equipment division manager for Star.

☆ ☆ ☆

Raymond I. Mahan has been transferred from Portland to Spokane where he will be district sales manager for the UNION OIL CO. of California. Mahan succeeds A. D. Gray, who has been transferred to Portland as district sales manager there.

☆ ☆ ☆

Nelson J. Leonard, a Navy officer in World War I, an Army Transport officer in World War II, and known in shipping circles for his materials handling knowledge gained at home and overseas, has been placed in charge of the Elwell-Parker trucks, tractors, and cranes account for the COLBY STEEL & ENGINEERING COMPANY, Seattle, Wash.

☆ ☆ ☆

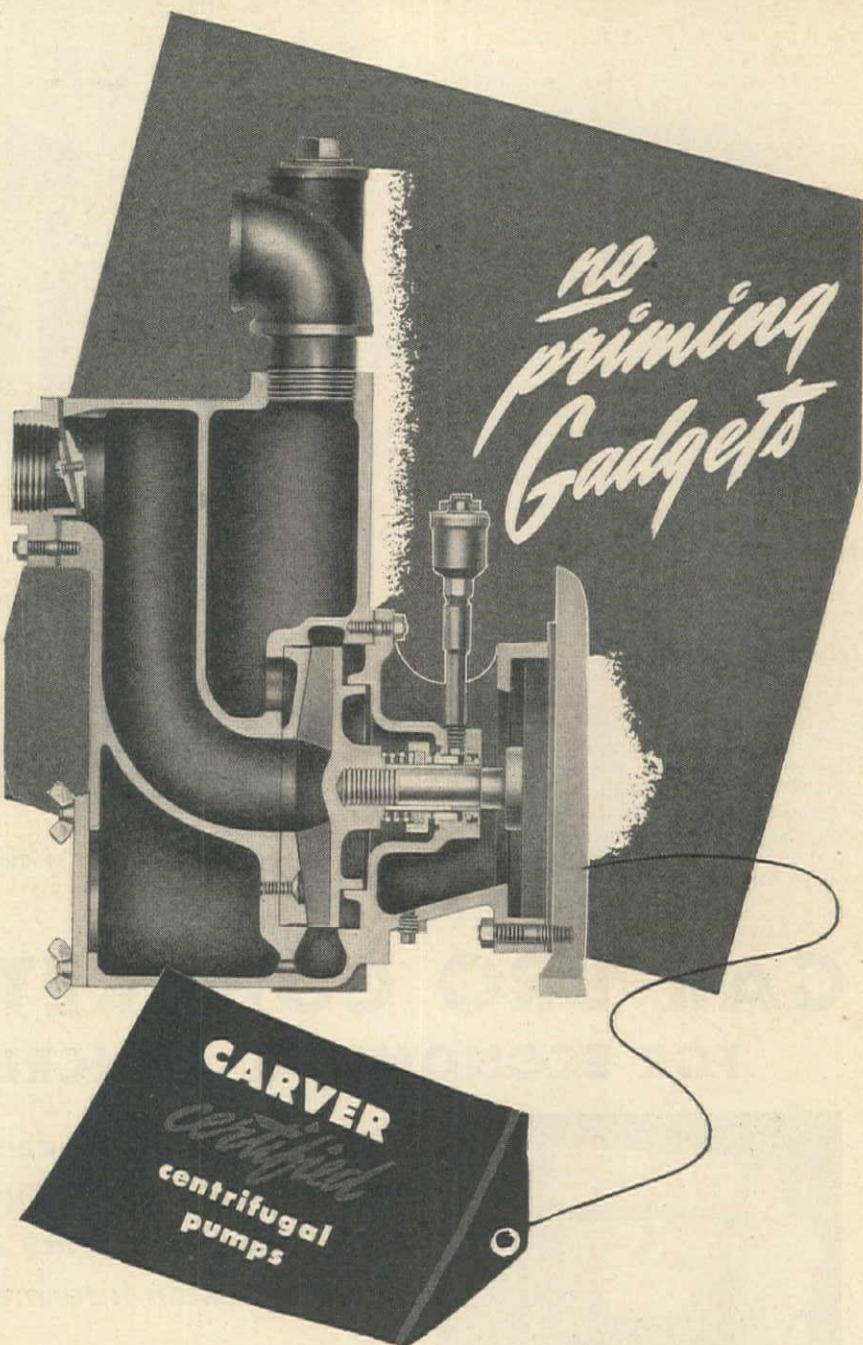
INTERMOUNTAIN



R. A. Otterness has assumed new duties for LIMA LOCOMOTIVE WORKS, INC., SHOVEL AND CRANE DIVISION as district manager of the southwestern district covering the states of Texas, Colorado, New Mexico, and Oklahoma, with offices at Dallas, Texas.

Otterness worked out of the Dallas office as sales representative for several years prior to his transfer in 1940 to the Seattle office territory which he has now left. He succeeds Fred L. Maus who has been transferred to Memphis, Tennessee, as district manager.

HERE'S ANOTHER REASON WHY CARVER PUMPS ARE BETTER



**NON-RECIRCULATING
NON-CLOGGING
NON-QUITTING**

CARVER PUMP CO. *Muscatine, Iowa*

WESTCO PUMP SALES CO. 2315 E. 8th Street, Los Angeles, California

WESTCO PUMP SALES CO. 560 W. 7th Street, San Francisco, California

EDWARD F. HALE CO. 22105 Meekland Ave., Hayward, California

Frank A. Burns was recently announced as the new public relations representative for Arizona, southern Nevada, and southern California for the COLUMBIA STEEL COMPANY, subsidiary of UNITED STATES STEEL CORPORATION. Prior to his new appointment, Burns served as a public relations representative for the ATCHISON, TOPEKA AND SANTA FE RAILWAY CO.

The STATE TRACTOR & EQUIPMENT COMPANY of Phoenix, Ariz., has been appointed distributor for the EUCLID ROAD MACHINERY COMPANY, covering the entire state of Arizona with the exception of Navajo, Apache, and Mohave counties. The appointment of this new distributor will provide improved service and parts facilities to contractor and industrial owners of Euclid equipment in Arizona. Roy Robinson is president of the company, while J. H. Tiller is sales manager and W. H. Bridges is office manager.

☆ ☆ ☆

AMONG THE MANUFACTURERS

Appointment of **Charles G. Herbruck** as assistant secretary of the **JAMES F. LINCOLN ARC WELDING FOUNDATION**, Cleveland, O., was announced recently by **Dr. E. E. Dreese**, chairman of the board of trustees of the foundation. Herbruck, who has been employed for the past five years in a supervisory capacity in the welding industry, comes to the foundation with first hand experience in using the technical advances in welding to reduce production costs and to increase flexibility in production of machinery to raise the standard of living.



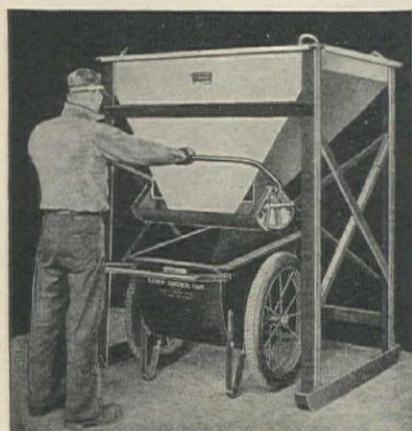
NEW BRANCH warehouse, sales office, and showroom of the Grinnell Company, opened in Long Beach, Calif., recently. Area in the building is 15,000 sq. ft., and an additional yard area of 25,000 sq. ft. is for pipe storage and other uses.

John M. Martin is the recently appointed assistant general manager of the cellulose products department of the HERCULES POWDER COMPANY, Wilmington, Del. This will make two assistant general managers for this department.

Retirement of Charles R. Moffatt as
director of advertising of UNITED

STATES STEEL CORPORATION OF DELAWARE was effected September 30 as he concluded forty years of service with the Corporation. Moffatt began his career with the Illinois Steel Corporation in 1907 as an auditor, transferred to the sales department in 1919, and was appointed advertising manager of the newly merged Carnegie-Illinois Steel Corporation in 1935. He attained the position as director of ad-

GAR-BRO CONCRETE HOPPERS FOR ECONOMICAL CONCRETE HANDLING



One of the 40 Models will fit the kind of job you have to do. **GAR-BRO HOPPERS** are used with tower buckets, truck mixers and similar concrete sources as an intermediate storage point.

40 Different Items.

Models from 14 to 135 Cubic Foot Capacity.

Grout Tight Non-Clogging Gates.

Standard Gate Opening 10" x 15".

Single and Double Gate Models.

GAR-BRO DISTRIBUTORS

A. H. Cox & Co. Seattle, Washington
Loggers & Contractors Machinery Co. Portland, Oregon
Intermountain Equipment Co. Boise, Idaho

Construction Equipment Co. Spokane, Washington
Arnold Machinery Co. Salt Lake City, Utah
Edward R. Bacon Co. San Francisco, California

GARLINGHOUSE BROTHERS, Los Angeles, California

**WRITE FOR CATALOG 70
For Detail INFORMATION
ON CONCRETE HOPPERS**

GAR-BRO

GAR-BRO
MFG. COMPANY

2416 EAST 16TH STREET
LOS ANGELES 21, CALIFORNIA

vertising in 1938, and effectively consolidated the advertising programs of all United States Steel subsidiaries before his retirement.

☆ ☆ ☆

George W. Dewees, veteran of 34 years' service with SKF INDUSTRIES, INC., died Tuesday, August 19, of a heart attack at his home in Clearwater, Fla. At the time of his death he was Florida sales and service engineer for the ball and roller bearing firm.

☆ ☆ ☆



With the completion of the first phase of its reconversion program, several changes in the corporation executive staff of R. G. LE TOURNEAU, INC., Peoria, Ill., were announced recently by R. G. LeTourneau, company president. Keynoting the reorganization is the appointment of Roy E. McCluskey, assistant treasurer, to the post of vice-president in charge of sales. His appointment coincides with the resignation of Oscar W. Nelson as vice-president and general manager of the Peoria division. Resignation of Robert F. Nelson as vice-president and assistant to the president was also announced.

☆ ☆ ☆

E. D. Wallace is new sales manager for the Buckeye Traction Ditcher division of GAR WOOD INDUSTRIES, INC., with headquarters at Findlay, O. Wallace is a veteran of twenty years in the heavy construction equipment field. Appointments of W. C. Petersen as service manager of the Buckeye division, W. E. Dawson as district manager for the West Coast for Gar Wood, and W. R. Steenrod as district manager, general line for Gar Wood in Milwaukee, were also announced.

☆ ☆ ☆

The FOUR WHEEL DRIVE AUTO COMPANY, Clintonville, Wis., experienced the largest non-war sales year in its 37-year history during the past fiscal year. Walter A. Olen, company president, revealed. Profits before taxes and special charges or credits for the year were \$1,265,524 on net sales of \$15,920,302, as compared with profits last year of \$669,930 on over \$18,000,000 in sales, according to the fiscal year annual report of the company.

☆ ☆ ☆

William S. Straub is the new superintendent, with Leonard J. Rimlinger and Ed J. Corel as assistant superintendents at PITTSBURGH PLATE GLASS COMPANY's Barberton, O., plant, it was announced by E. T. Asplundh, vice-president in charge of the Columbia Chemical division. Straub, assistant superintendent at the plant since 1941, succeeds R. L. Hutchinson, recently named general superintendent for all plants operated by Columbia Chemical Division and the SOUTHERN ALKALI CORP., a Pittsburgh Plate subsidiary. Straub has been associated with the Columbia division since 1929.

☆ ☆ ☆

Harry C. Dishman, George T. Young, E. E. Juergens, and John E. Cole were recently appointed to new positions in the Equipment Sales division of RAYBESTOS-MANHATTAN, INC., Passaic, N. J. Dishman, an employee of the firm since 1916, becomes equipment sales man-

ager with headquarters in Detroit. Young, a veteran of 30 years' service with the company, becomes branch manager of the Detroit office, while E. E. Juergens has been appointed branch manager of the Cleveland office. Cole, who joined Raybestos-Manhattan in 1939, is new branch manager of the Chicago office.

☆ ☆ ☆

BLAW-KNOX COMPANY, Pittsburgh, Pa., announces that it has completed a redesign of a major portion of its line of construction and roadbuilding equipment including the development of a number of new items. Highlighted in this development of new and improved items is a revolutionary type of road subgrader for paving construction that utilizes vibration to disintegrate and cut through the material

to be excavated. A streamlined "Hi-Boy Trukmixer" is the first Blaw-Knox entry in the high-discharge type of truck mixer and it features a common hopper for charging the materials into the drum and discharging the mixed concrete. Many other improvements and new designs were specified by Blaw-Knox.

☆ ☆ ☆

Four divisional managers of NORDBERG MANUFACTURING COMPANY, Milwaukee, Wis., have been recently made vice-presidents of the company, according to announcement by R. E. Friend, president. They are Roland W. Bayerlein, heavy machinery; H. H. Talboys, railway equipment; D. A. Cheyette, crusher; and R. R. Shafter, process machinery. Bayerlein has been associated with



PROTECT AGAINST TIME LOSS BY:

SPACE HEATING of temporary buildings, storage sheds, repair shops, buildings under construction.

PREHEATING engines and all kinds of mechanical equipment.

SPOT HEATING of materials, workers, machinery, storage tanks, tools.

THAWING frozen areas and machinery, wheels, gears, transmissions, caterpillars, etc.

DRYING and curing of materials, plaster, paint, mortar, concrete, etc.

VENTILATING and heating of manholes, tunnels, box cars, ship holds, confined areas of all kinds.

KEEP GOING THIS WINTER WITH HERMAN NELSON PORTABLE HEATERS!

Let it Snow! Let it Freeze! Here's quick, clean, safe HEAT... to combat damp and icy weather on any job. Herman Nelson Portable Heaters protect men, machinery and materials. It's protection you can't afford to overlook — protection against time loss! Why gamble needlessly when, with Herman Nelson Portable Heaters at work, you can get HEAT, lots of it — where you want it, when you want it — without waste. This efficient unit is no bigger than a kitchen stove, yet produces enough heat for three ordinary 5-room houses. And it's all done without smoke, soot or open flame!

Write for Interesting, Free
Booklet on "Cost Control"



THE HERMAN NELSON CORPORATION MOLINE ILLINOIS

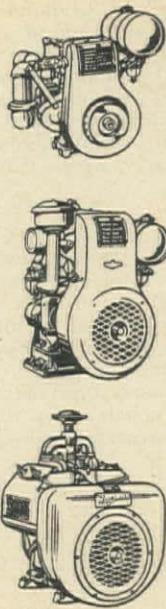
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12
11
The
**REAL MEASURE
OF ENGINE VALUE IS
"H. P. HOURS"
of POWER SERVICE**

It isn't the original H.P. rating of an engine that counts but rather, the number of H.P. Hours of power service it will deliver during its lifetime. This, in the final analysis, is the real measure of engine value.

Wisconsin Air-Cooled Engines deliver the most H.P. Hours because they are designed and built for rugged, heavy-duty service. For example: every Wisconsin Engine, from the smallest to the largest, runs on Timken tapered roller bearings at both ends of the crankshaft to take up end-thrust and provide the best protection against bearing failure . . . at the same time assuring a smooth-running engine. This is just one typical detail that stands back of "Most H.P. Hours" of on-the-job power service.

You can't go wrong if you specify "Wisconsin Air-Cooled Engines" to meet your power requirements, within a 2 to 30 hp. power range.

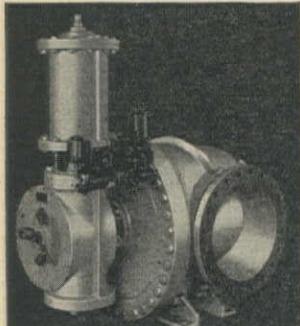


Wisconsin Engines are available in a complete range of types and sizes (all 4-cycle) from 2 to 30 hp.

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by simply changing control mechanism



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S. MORGAN SMITH Co.
YORK, PENNA. U.S.A.

Nordberg since 1919 when he started apprenticeship in Nordberg shops as a co-op engineering student of Marquette University. Talboys, well known in railroad circles, joined the company in 1923 as manager of the railway equipment division. Cheyette, who has a background of 30 years of experience in crushing, grinding, cement and mining machinery design and application, has been with Nordberg since 1937. Shafter, who was associated with Taylor Engineering and Manufacturing Co. for over 33 years, came to Nordberg in 1944.

☆ ☆ ☆

New managing director of the TONCAN CULVERT MANUFACTURERS ASSOCIATION is Hubert E. Snyder. The company's headquarters are in Cleveland, O.

☆ ☆ ☆

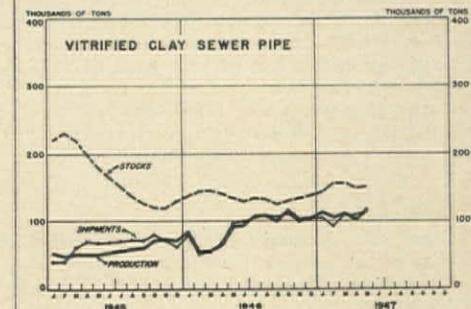
Appointment of Harry G. Campbell as sales manager of the DieselLight division of THE BUDA COMPANY, Harvey, Ill., was announced by the firm recently. This division handles sales and manufacture of Diesel electric and gasoline electric generator sets. Campbell was associated with WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY at Pittsburgh for 15 years, in the sale and manufacture of generator sets.

☆ ☆ ☆

PETTIBONE MULLIKEN CORPORATION, Chicago, Ill., has appointed THE ADVERTISING CORPORATION to handle advertising on its products, which include buckets and dippers for power shovels and draglines. R. H. McCormick, formerly advertising manager of the VASCOLOY-RAMET CORPORATION and AMERICAN HOIST AND DERRICK CO., is now on the agency's executive staff.

☆ ☆ ☆

A new postwar high was reached in the month of August for vitrified clay pipe when 114,545 tons of material were shipped. According to the record shipments which constitute a 27 per cent increase over last year's figures, a record 1,400,000 tons of vitrified pipe should be shipped by the end



of the year. Increased summer building is one of the causes of the clay pipe boom, plus the fact that clay pipe producers have been successful in keeping the price of their products at the lowest percentage increase in the building materials field.

☆ ☆ ☆

The B & M MANUFACTURING COMPANY is the name of the recently formed firm organized by Wiley W. McMinn and Olof Brant, formerly vice-president and chief development engineer respectively of Agaloy Tubing Co. The company's factory in Grand Rapids, Mich., will manufacture spirally formed tubular products under the trade name of Spiralock. General offices are in East Orange, N. J.

Edward B. Kohl, previously with the Houston branch office of the sales and service engineering staff of BROWN INSTRUMENT DIVISION of MINNEAPOLIS-HONEYWELL REGULATOR COMPANY, has been transferred to the Corpus Christi, Texas, office. I. K. Farley has been transferred from the Philadelphia branch office to Houston.

☆ ☆ ☆

A. W. Schmidt has been named advertising manager of LA-PLANT-CHOATE MANUFACTURING CO., INC., at Cedar Rapids, Ia., to succeed H. K. Kenyon, it was announced recently by E. R. Galvin, vice-president and general sales manager. Schmidt has been in the LaPlant-Choate organization since 1930. He joined the company as blueprint boy in the engineering department and progressed from there to parts and service department, machine order bureau and general sales. He was manager of sales and service training until his appointment to the position of advertising manager.

☆ ☆ ☆

William E. Clark, general manager of DRAVO CORPORATION's Keystone division, was recently elected a vice-president of the corporation at Pittsburgh, Pa. Clark joined the LEHIGH PORTLAND CEMENT CO. in 1924 and was manager of its Pittsburgh office until 1930 when he was appointed assistant to the manager of the KEYSTONE SAND AND SUPPLY CO., Pittsburgh, one of the pioneer Dravo companies. In 1937 he became president of a wholesale construction materials firm, later acquiring control of the company and operating it as the W. E. CLARK CO. This company was merged with the Keystone division in 1945 and its activities continue under the Keystone name.

☆ ☆ ☆

Another recent appointment continuing the reconversion program of R. G. LETOURNEAU, INC., Peoria, Ill., is that of L. A. Welch to the position of executive vice-president for the corporation. Welch, a prominent Peoria business leader, will assist in coordinating the functions of division managers at LeTourneau factories. He has a broad background of administrative experience, and served during the war as deputy director of production for the War Production Board, Washington, D. C., in charge of field production, and for a period of time as regional director of the WPB in Detroit.

☆ ☆ ☆

I. L. Pierce is a new director of the FORD MOTOR COMPANY service department, it was announced recently by J. R. Davis, vice-president and director of sales and advertising. Although the Ford service department and the Ford parts and accessory sales department will both remain under the jurisdiction of the sales department, the two departments which formerly operated together, will be separated. A. B. Pease will continue to direct parts and accessory sales, while R. W. Hickl is to manage auto accessory sales activities, with Arthur W. Kelley in charge of accounting for parts and accessory sales under M. E. Sheppard, general assistant controller.

NEW EQUIPMENT

MORE COMPLETE information on any of the new products or equipment briefly described on these pages may be had by sending your request to the Advertising Manager, Western Construction News, 503 Market Street, San Francisco 5, California.



Huge Crawler Tractor

Manufacturer: Allis-Chalmers, Milwaukee, Wis.

Equipment: World's largest crawler tractor, the HD-10.

Features claimed: Increased capacity and performance, dependability and longer life, and improved operator comfort are the three major advantages claimed for this mammoth tractor. A three stage hydraulic Torque Converter introduced into the power train increases capacity for work. Operating adjustments, maintenance points and major assemblies are so located and designed that care, maintenance and repair of the tractor can be accomplished with a minimum of effort. A wide, comfortable, easily adjusted operator's seat affords maximum visibility. The HD-10 has two for-

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PRESENT DRAGLINE BUCKET!

**ONE CU. YD.
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Check the struck measure of your bucket. See what you are loading! Ask your

Page AUTOMATICS are built in perforated, slat or standard designs and are guaranteed to outdig any other dragline bucket at any depth.

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DRAGLINE BUCKETS and
WALKING DRAGLINES

ward speeds (0 to 3.0 low gear, 0 to 7.0 high), and one reverse (0 to 5.5). A track tread of 84 in., plus 8 ft., 10 $\frac{1}{2}$ in. of track on the ground, provide excellent ground contact.

Single Pass Soil Stabilizer

Manufacturer: The Harnischfeger Corp., Milwaukee, Wis.

Equipment: New P&H Single Pass Soil Stabilizer.

Features claimed: Groups active in road planning and building may avail themselves of a motion picture of this new machine, free of cost. Filmed in full color, the



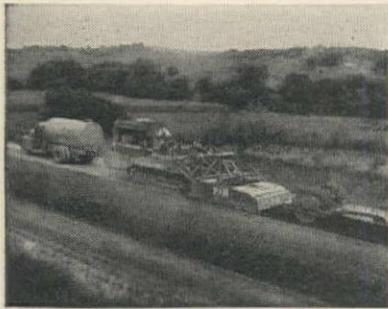
generator driven from the same diesel supplies power for driving feeder, conveyors, screen and elevating wheel on the screening unit. Crushing unit is semi or full trailer assembly 28 ft. long. Crusher is the New Holland 3030 Double Impeller Impact breaker. The two-unit portable plant has a capacity up to 200 tons per hour of crushed stone.

Concrete Vibrator

Manufacturer: Aristo Power Tools, Inc., Chicago, Ill.

Equipment: New heavy duty concrete vibrator.

Features claimed: Especially built for heavy duty work, this unit firmly compacts



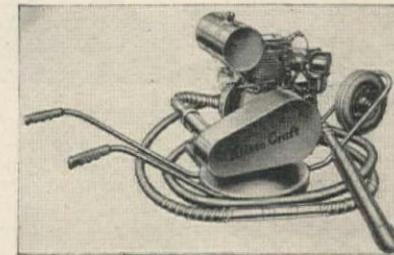
picture covers all phases of the product, explaining operation of the machine and how it performs all stabilizing operations in a single pass. Machine is claimed to shave and pulverize the in-place material, blend, apply the liquid, final mixes and spread to a uniform depth. The Stabilizer also processes asphalt and native soil in the laying of airport runways.

Six Yard Shovel

Manufacturer: Harnischfeger Corporation, Excavator Division, Milwaukee, Wis.

Equipment: New Model 1600 electric shovel.

Features claimed: Delivered to the Shen-Pen Production Company, Shenandoah, Pa., this new model is being used to increase coal stripping production in one of the largest jobs in the anthracite coal fields. Important features of the new electric shovel are: Magnetorque drive, eliminating all mechanical clutching, Directron control, independent propel drive, worm gear crowd action, and all-welded construction.



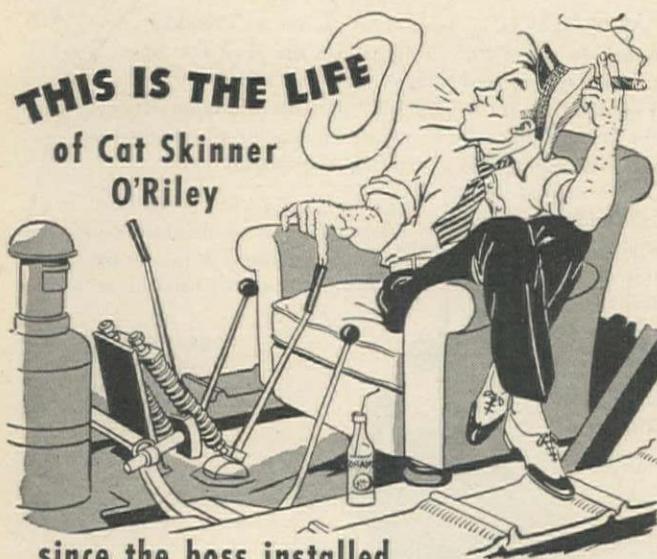
Crushing and Screening Plant

Manufacturer: New Holland Manufacturing Co., Mountville, Pa.

Equipment: Portable two-unit crushing and screening plant.

Features claimed: Adaptable to either gravel crushing or quarry operations, the diesel power plant operates the 3030 Double Impeller Breaker while an electric

concrete around reinforcing rods and against forms in spots where hand puddling is difficult. Attachments for concrete finishing such as grinding, sanding and wire brushing are also available. Automatic clutch provides smooth operation, while the engine is a 4 hp. air-cooled Wisconsin. Other features include a flexible shaft with $\frac{1}{2}$ in. core of stranded music wire, a vibrating head with two single rows of anti-



O'Riley wasn't ever one to shy away from work but—"What's the sense of doing things the hard way," he reasoned.

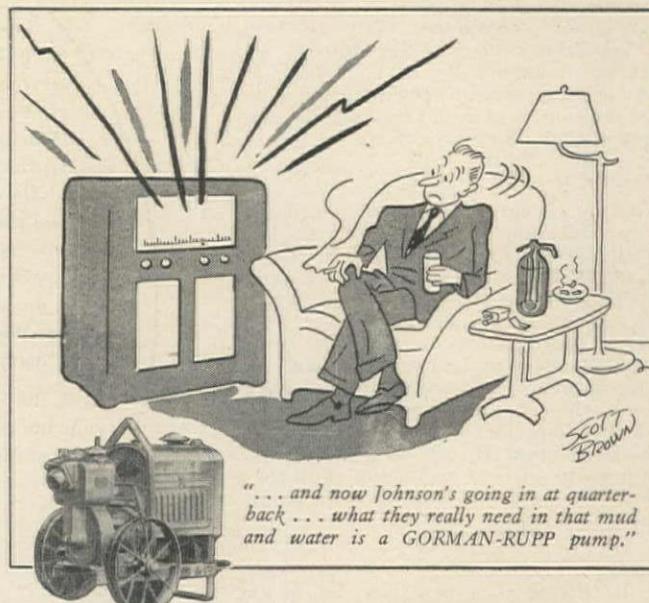
He asked the Boss if he still remembered *his* cat skinning days and steering lever struggles. He explained how Silver Steering Boosters permit ONE-FINGER OPERATION OF STEERING LEVERS and showed that the opening of clutches full travel every time would cut maintenance costs to a minimum, too.

The Boss appreciated O'Riley's progressiveness as you can see!

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- very inexpensive
- Write for complete literature.

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THE GORMAN-RUPP COMPANY
MANSFIELD • OHIO

friction ball bearings at each end of the rotor shaft and a single ball thrust bearing in the head for longer wear. Jackshaft has a heavy positive lock, and drive is a twin V-belt with belt guard. Vibrating speed is 8,000 r.p.m.

Swivel Hook Assembly

Manufacturer: Thomas Laughlin Co., Portland, Me.

Equipment: New replacement swivel hook assembly.

Features claimed: Embodying the recently improved safety latch, the new hook comes in $\frac{1}{2}$ and 1 ton sizes and is recommended for cranes and hoists, or lashing



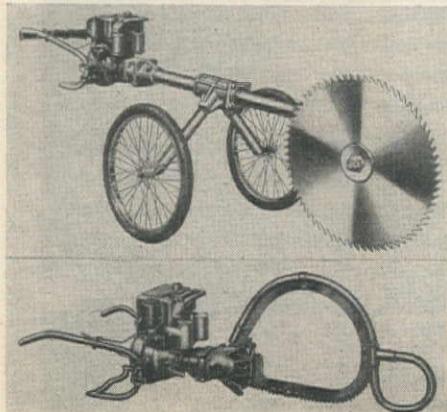
applications where safety is an important consideration. Ease of installation is a principal feature, since it is only necessary to unbolt the present load hook swivel assembly and bolt the new one on. Graphite-impregnated bronze washer under the nut assures easy swivel action, and the heat-treated alloy swivel bolt gives maximum strength and long life.

Three Timber Saws

Manufacturer: Mall Tool Co., Chicago, Ill.

Equipment: Three new power timber saws.

Features claimed: The three models, the Model 7 Gasoline Engine Chain Saw,



Models 30 and 36 Circular Saws, and the Mall Bow Chain Saw, all contain a new powerful gasoline engine interchangeable on all models. The Model 7, for felling and bucking big timber including trees 12 ft. in diameter, is compact in design, and weighs only 75 lb. Models 30 and 36 are for clearing land, felling, limbing, and bucking pulpwood and timber. The 30-in. blade will cut any tree 22 in. in diameter. Entire unit weighs only 200 lb., therefore it can be used on rough terrain where heavier machines are too tiresome to move and use. Fully automatic centrifugal clutch stops blade from revolving while engine idles. For smaller timber or pulpwood, the Mall Bow Chain Saw is available. Bow design prevents pinching of chain in cut. Cutting unit can be swiveled to any angle for felling or bucking cuts. Available in 18-in. cutting capacity.

Screw Anchor

Manufacturer: Holub Industries, Inc., Sycamore, Ill.

Equipment: Sandscott Plastic Expanding Anchors.

Features claimed: Overlapping internal and external slits in the expanding anchors give a "concertina" expansion, which aids in holding all sorts of materials. Anchors are made slightly larger in diameter than the hole size to be drilled. They may be used with wood screws or lag screws for fastening into concrete, brick, plaster, tile, stone, marble, terra cotta, composition boards, stucco, wood, glass, rubber, and many other substances. Available in seven sizes in various lengths, sizes range from $\frac{1}{4}$ in to 5/16 in. lag screws or from No. 5 to No. 20.

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AEA

For Air Entrained Concrete

**EASY TO USE — INEXPENSIVE
IMPROVES WORKABILITY
PREVENTS SEGREGATION
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MAKES CONCRETE MORE UNIFORM — DURABLE**

Acclaimed by leading concrete engineers for higher quality and economy, DAREX AEA is officially approved and has been used in millions of cubic yards of concrete, in buildings, dams, highways and aqueducts.

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Blue Diamond Corp., Los Angeles
Denver Fire Clay Co., Salt Lake City
Baker-Thomas Lime & Cement Co., Phoenix
Ray Corson Machinery Co., Denver
Mason's Supply Co., Portland
Hawaii Builders Supply Co., Honolulu**

Darex AEA is manufactured by Dewey and Almy Chemical Co.
Cambridge, Chicago, Oakland

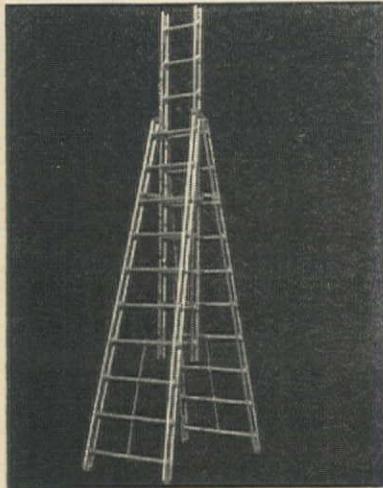
Represented in Eleven Western States, Alaska and Hawaiian Islands by
Charles R. Watts & Co., Seattle 7, Washington

New Aluminum Trestle Ladder

Manufacturer: Aluminum Ladder Co., Worthington, Pa.

Equipment: New aluminum trestle ladder.

Features claimed: Suitable for use in painting, cleaning, interior decorating, servicing outdoor signs, and similar work, the new ladder is made of lightweight aluminum alloy throughout and may be



used either with others to support stages and platforms, or may be disassembled to form two separate units. Adjustable center piece ladder may be removed for use as a straight single wall ladder, and the remaining part becomes an "A" type ladder. Ladder is available in extended lengths of 10, 14 and 18 ft., the 18-ft. ladder weighing 55 lb.

Rechargeable Hand Lamp

Manufacturer: U-C Lite Manufacturing Co., Chicago, Ill.

Equipment: New rechargeable 2,500-ft. beam hand lamp.

Features claimed: This new lamp claims to solve the problem of how much charge remains in a battery. The Big Beam Model No. 311 has three transparent windows, one for each battery cell. Three specific gravity ball indicators, one green, one white and one red appear in each window. When the green ball is down, the battery is 5 per cent discharged; when the white ball is down, battery is 50 per cent discharged; when the red ball is down, battery is 95 per cent dis-



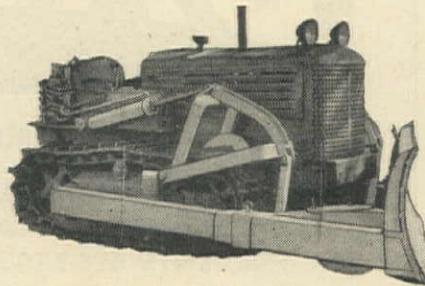
charged. When fully charged all three balls rise to the water level line. Battery case is 100 per cent spillproof, with shelf life of the battery 90 days under favorable conditions. Accessories include hold-down bracket, carrying strap, resistance switch, wire guard, snap-on lens red, green, blue and floodlight, and other items. Construction companies, contractors, maintenance men, industrial plants, and utility companies are a few concerns who can use this machine to advantage.

Twin-Controlled 'Dozers

Manufacturer: Drott Manufacturing Corp., Milwaukee, Wis.

Equipment: Twin-Controlled Tilting Bulldozers and Bullangledozer.

Features claimed: Although not strictly new equipment, these machines are being sold and serviced for the first time by Oliver Cletrac dealers throughout the country. Both types of twin control bulldozers are operated by the closed hydraulic



system. Each of the twin pumps, mounted and concealed on the front of the tractor, operates a cylinder through separate valves and enables the operator to raise or lower either side of the blade from the seat, while

the tractor is in motion or standing still. Close mounting of blade to radiator for better balance, good operator vision, and simple construction through a "Cradle Lift" are other important features of the machines.

Snow Plow Wax

Manufacturer: Pennsylvania Refining Co., Cleveland, Ohio.

Equipment: New liquid snow plow wax.

Features claimed: Snow removal is faster and easier, it is claimed with Penn Drake Snow Plow Wax, a material which may be easily applied to moldboards, blades and wings of snow plows. It immediately cre-



ates a hard, slick surface off which even the wettest snow slides easily. Costly delays are eliminated because it prevents the piling up of snow. The wax, which is applied with an ordinary paint brush to a dry surface, acts as an effective means of preventing rust. Plow can be placed in service within several minutes after application. One gallon of wax covers approximately 300 sq. ft. of plow working surfaces.

Spray Gun Nozzle

Manufacturer: A. Shelbourne Co., Los Angeles, Calif.

Equipment: Heavy duty spray gun nozzle.

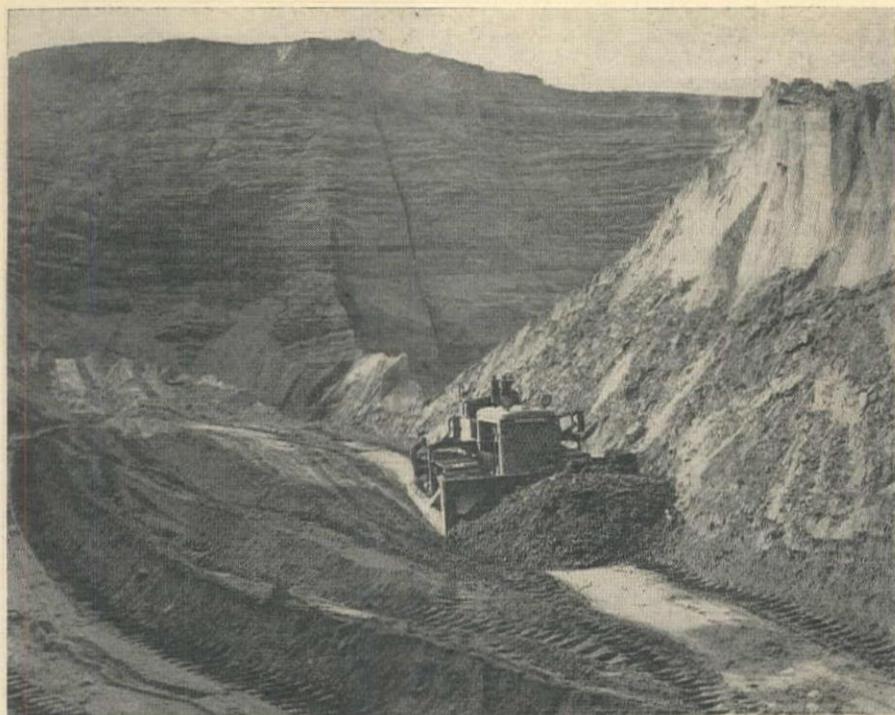
Features claimed: Nozzle of this spray gun, which may be changed quickly from pole gun to hand gun, will handle compounds from shingle stain to asbestos fibred aluminum paint. Opening is round in cross section, but a fan-shaped spray is delivered through it. Spray is evenly distributed over a wide oval without clogging, without use of side wings, and with a minimum of overspray.

AND A MOUTHFUL AT EVERY BITE

Exclusive features, expert design and superior construction characterize Owen buckets. Long life with dependable service has resulted wherever Owens have been put to work.

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GRAVEL PIT operations of the Chandler Palos Verdes Sand & Gravel Co., Palos Verdes, Calif. The pit is furnishing 2,500 tons daily at the present time. The back wall of the cut is 225 ft. high. Shown here is an International TD-18 Diesel crawler tractor with Bucyrus-Erie cable dozer working the sand up to the hopper of a dry screening plant. Two electric draglines with 5-ton buckets are also utilized to move sand to the screening and washing plants. This pit has been in operation since 1937, but demand has so increased with the great housing and construction program which is in progress in Los Angeles and vicinity, that nearly 24-hr. operation is necessary.

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.

UNDERPASSES AND SERVICE TUNNELS—Armco Drainage & Metal Products, Inc., Middletown, Ohio, has published a 24-page manual explaining how to provide underground passageways for people, livestock, merchandise or utility lines. Where it is desirable to avoid a busy street, railway, or highway the construction of an underpass, conduit, or tunnel can be efficient and economical. The manual is amply illustrated with photographs of the various types of underpasses and service tunnels, showing the safety they provide, or the ready access or direct connection they give. Data on sizes and shapes of openings is provided, and descriptions of available metal structures is given.

ALUMINUM WINDOWS—Union Aluminum Co., Inc., Sheffield, Ala., has just released a brochure and price list illustrating their "Lifetime Aluminum Casement Window." The different types of windows, sizes and installation in the various building media are shown.

TRENCHLINER—Parsons Co., Kochring subsidiary at Newton, Iowa, has just published a new bulletin describing the Parson 200 Wheel Trenchline, the new pipeline and drainage trencher. Thirty action pictures, detail photos and draw-



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WESTERN EQUIPMENT CO.

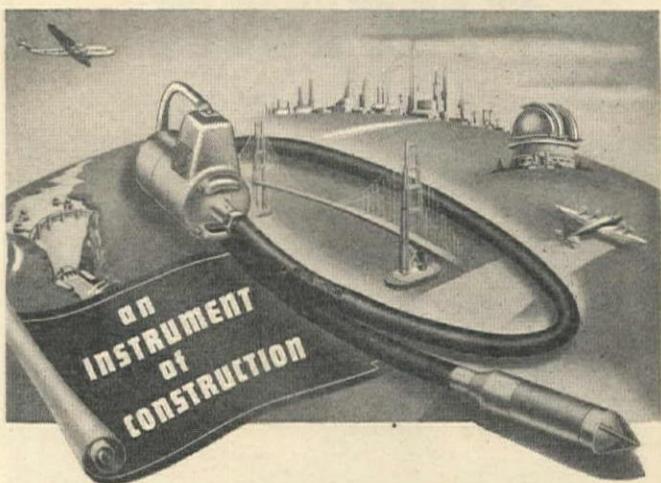
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"THERE'S NOTHING TOUGHER THAN A DIAMOND"



DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIV.

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**ENGINEERS AND CONSTRUCTION MEN AGREE
VIBER VIBRATORS REDUCE CONSTRUCTION TIME AND COST!**

To obtain maximum density and strength in concrete, it is important that the entire mix be given internal high speed vibration. This reduces voids, honeycombs, shrinking and cracking, also placing and compaction time. Built to withstand the strain on heavy construction jobs, the VIBER Vibrator makes practical the use of drier mixes. The interchangeability of VIBER units permits quick conversion to changing job conditions, eliminating delays, and the light weight portability offers easy one-man operation.

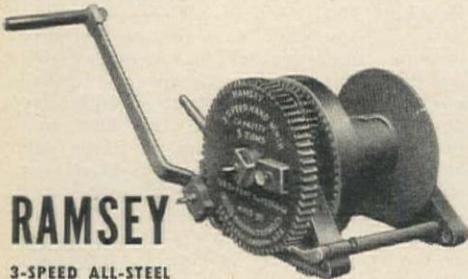


Important facts and specifications on VIBER Vibrators furnished upon request.

ORIGINATORS OF INTERNAL CONCRETE VIBRATION

727 S. FLOWER, BURBANK, CALIFORNIA

ings show and explain features like the pivot wheel mounting, reported to simplify grade adjustments, particularly in drainage work. Also shown is the new Parsons tile chute which in recent tests improved tile laying output by approximately 20%. The direct power flow and advantages of enclosed gearing are graphically illustrated. Specifications are also included in the bulletin.



RAMSEY

3-SPEED ALL-STEEL

HAND WINCH

3-SPEEDS
in all models

GEAR RATIOS
25-1, 4-1, 1-1

3 Ton "Junior"—Drum capacity: 150 ft. of $\frac{1}{2}$ " cable; wt. 75 lbs; \$60

5 Ton "Standard"—Drum capacity: 325 ft. of $\frac{1}{2}$ " cable; wt. 135 lbs; \$85

5 Ton "Heavy Duty"—Drum capacity: 325 ft. of $\frac{1}{2}$ " cable; wt. 140 lbs; \$90

Power models also available.
Write for literature.

Cascade Manufacturing Co.

2439 N. W. 29th Avenue, Portland 10, Oregon

LATEST STANDARDS LIST—American Standards Association, New York City, N. Y., has released an entire new listing of its 874 standards. This listing includes prices which are revised slightly upward because of increased production cost. A number of additional revised standards approved since the January, 1947, issue of all American Standards are included. Under the new price listing a complete set of all American Standards comes to \$200.00 and a complete set of all American Safety Standards costs \$32.50 a set.

SLURRY PUMPS—Pettibone Mulliken Corp., Chicago, Ill., has just published a 16-page bulletin on their new Slurry Pump whose wear parts are centrifugally cast of abrasion resistant Diamond alloy. Complete, detailed description, engineering and pumping data, selection chart, dimensions, assembly drawings and parts list are included. The bulletin demonstrates in general the outstanding mechanical features of the pump, including the characteristics of Diamond alloy which specifically withstands abrasion and corrosion and gives harder, better, longer wearing parts, and increases pump life and efficiency.

WATER BOY—H. Wenzel Tent & Duck Co. of St. Louis, Mo., have sent off the press a new color folder explaining the use of the unique, new Water Boy Drinking-Water Bag, a five-gallon capacity bag with spigot turned upward to be used as a drinking fountain or spigot turned down to fill drinking cups. The bag may be hung, or attached to an apron and harness for carrying and can be well used by railroad section crews, building contractors, harvest hands, road builders, lumbermen, and maintenance units.

SANITARY ENGINEERING EQUIPMENT—The Dorr Co., New York City, N. Y., has published a four-page, color leaflet, "New Sanitary Engineering Equipment for 1947," which is essentially a preview of the new equipment items which were featured at the AWWA-FSWA convention in July. The six new units are: the Dorr S-7 Clarifier; Dorr Duo-Clarifier; Dorco Duo-Filter; Dorr Type M Digester; External Sludge Heater; and Dorco Sulzer Disintegrator. Page four of the leaflet illustrates how all Dorr units, both old and new, fit into conventional sewage treatment flowsheets.

NON-TILTING MIXER—Kwik-Mix Co., Port Washington, Wis., a Koehring Co. subsidiary, has just published a new illustrated bulletin describing the Kwik-Mix 6-P Plaster-Mortar Mixer, a tool for small and large plaster and mason contractors. Photographs of the mixer in action and pictures of the parts of the mixer amply illustrate the leaflet. Condensed specifications are also given.

NI-RESIST—The International Nickel Co., Inc., New York City, N. Y., has released a revised, 36-page, well illustrated booklet concerning Engineering Properties and Applications of Ni-Resist. The booklet gives detailed information on the

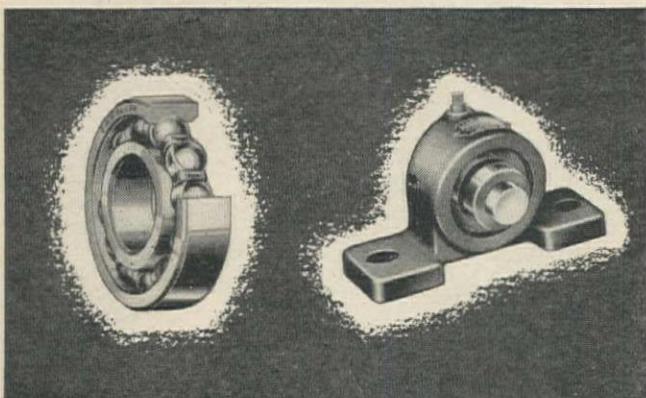
FOR SALE

Model 2 Northwest combination shovel. Al shape \$7,000. 10 Drag & Clam buckets, $\frac{1}{2}$ to $1\frac{1}{2}$ cu. yd. New, standard makes, \$575. 8-10 yd. scraper. New \$3,000.

TEUBERT & TEUBERT
EXCAVATING & LAND LEVELING
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any TYPE, any SIZE, for any PURPOSE!

Fafnir Ball Bearings help you save installation time, improve machine performance, and reduce maintenance and power costs.

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San Francisco: 434 Larkin St. Tel. Ordway 3-0981
Seattle: 611 East Pine St. Tel. Prospect 8744

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**RETIP TAMPERS IN FIELD
WITHOUT Welding!**



A Tamprite Tip is merely driven off its shank and a new tip driven on in a few minutes. A driving fit combined with positive alignment insures permanent installation until removal is required.

The combination of an easily welded shank and an easily replaceable tip is a patented feature not available in any other Tamper Foot on the market.

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STEEL CASTING CO.**
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LU-6211

physical and mechanical properties of this widely used cast nickel alloy. Performance under a wide variety of industrial conditions involving corrosion, heat, and wear is described. Corrosion data for 400 corrosive media are presented in tabular form, completely indexed.

GAS WELDING — Eutectic Welding Alloys Corp., New York City, N. Y., has published Vol. 4, No. 7 issue of the Eutectic Welder. The magazine is entirely given over to the new development, "Ready-Flux-Coated" EutecRods for gas welding. These new "Ready-Flux-Coated" rods are a major advance in the gas welding field. Because the proper amount of flux is already on the rod, the necessity for a separate fluxing operation is eliminated. The rods are available for all types of metals such as cast iron, steels, brass, bronze, copper, nickel, aluminum and magnesium. This issue will bring the reader up to date on the latest developments in gas welding.

SPHEROIDS — Chicago Bridge & Iron Co., Chicago, Ill., announces the publication of a new 16-page booklet, "The Hortonspheroid and Hemispheroid." This booklet describes the reduction of evaporation losses from motor and natural gasolines by storing them in Hortonspheroids or Hemispheroids. A standard capacity table indicates the operating pressures available for each size of vessel. Cutaway drawings show the general design of the nodded and smooth Hortonspheroid and the nodded and plain Hemispheroid.

HOISTS AND BODIES — St. Paul Hydraulic Hoist Division, Gar Wood Industries, Inc., Minneapolis, Minn., has published an attractively printed in yellow, blue and black folder entitled "Medium Heavy Duty Hoists and Bodies." In this folder a number of appealing little mechanics explain the operation of St. Paul's Model 7 Hoist and point out its construction features. The literature also shows St. Paul steel dump bodies in various styles. Both 10 gauge (Medium heavy duty) and 8 gauge (Extra heavy duty) bodies are illustrated.

REVOLVING CRANE — Joshua Hendy Corp., Torrance, Calif., has released a four-page, color bulletin concerning the Hendy Type U Crane to be used most successfully when handling heavy concrete culvert sections, construction beams, mechanical equipment, pipe, bar-stock, concrete reinforcing and any of the heavy loading and unloading of the average general contractor. An angular and linear load chart and radius diagram has been prepared by the Joshua Hendy Corp. Industrial Equipment Co., Oakland, and Los Angeles, Calif., is at this time distributing the Hendy Crane.

REAR-DUMP — The Euclid Road Machinery Co., Cleveland, Ohio, has sent off the presses a new catalog folder describing and illustrating the Model TD Rear-Dump Euclid having a payload capacity of 22 tons and powered by a 275-h.p. diesel engine. Although a relatively new addition to the line of Euclid earth moving equipment, this model is said to have wide acceptance by open pit mine operators for hauling coal, ore and overburden. The Model TD Rear-Dump is also used by contractors to move big yardages of heavy excavation on large projects.

"A WORLD OF AGGREGATE" — Iowa Manufacturing Co., Cedar Rapids, Iowa, has released a new forty minute movie photographed in Kodachrome, with music and interesting dialogue, entitled "A

World of Aggregate." The picture graphically shows the important part played by aggregate—sand, gravel and crushed stone—in all kinds of construction and what this means to the average citizen in his everyday life and to industry in general. Featured in the film are the various types of equipment built by the Iowa Manufacturing Co. for producing aggregate and mixing asphalt. Animated drawings in color show how the principal types operate. Also included is a brief section showing where and how these plants are built. The movie will appeal to the general public as well as to the men in the construction industry.

HIGHWAY EQUIPMENT — Littleford Bros., Inc., Cincinnati, Ohio, has published a color broadside describing and illustrating some of its modern equipment required in road construction and repair.

The Littleford Model No. 106 and No. 108 highway brooms for quick easy brooming of roads before applying asphalt, etc.; the "Spray Master" pressure distributors for spraying of asphalt, tar, road oil and emulsion; "Tankar" steam heater Model No. 115; Supply tanks Model No. 102 and 103; as well as the Trail-O-Distributor are explained and photographed in this bulletin.

CEMENT WATERPROOFING — Ranetite Manufacturing Co., Inc., St. Louis, Mo., has released a 12-page illustrated booklet which describes the simple way to make leaky masonry bond dry. The booklet pictorially describes waterproofing with Ranetite No. VVV Cement, its application, mixing, roughening, bonding, and coving. A 4-way test showing Ranetite No. VVV for perfect waterproofing, and a section on estimating materials is given.

Shovel Operators Are Talking About . . .

A revolutionary new power shovel clutch that provides smooth, positive action in place of jerky, uncontrolled performance . . . a clutch that seldom requires adjustment . . . a clutch with only one working part, and without a single cam, lever, bolt, piston or valve.

→ It's a power shovel clutch with direct air power that assures positive control, without any "grabbing" effect . . . a clutch that needs no mechanical attention . . . a clutch whose simple operation automatically compensates for any wear on the clutch linings.

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OSGOOD
AIR-CUSHION
CLUTCH

ANOTHER
OSGOOD "FIRST"



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THE OSGOOD CO.  THE GENERAL CO.
EXCAVATOR
MARION OHIO
DIESEL GASOLINE OR ELECTRIC POWERED • 3/4 TO 2 1/2 CU. YD. • CRAWLERS & MOBILCRANES

OPPORTUNITY SECTION

FOR SALE

1—Jeffrey battery loco., 3 ton, 24" gauge
 1—Goodman battery loco., 3 ton, 24" gauge
 2—Mancha battery locos., 5 ton, 36" gauge
 2—Plymouth gasoline locos., 8 ton, 36" gauge
 2—Root-Connorville blowers, 10,000 CFM with 125 HP. syn. motors
 2—Root rotary blowers, size 7 1/2, with 100 HP. motors
 2—Sullivan air compressors, 868 and 1051 CFM
 3—180 HP., 6 cyl. Fairbanks-Morse full diesel engines
 2—260 HP., 6 cyl. Superior full diesel engines
 1—C. S. Johnson batch plant with 30 ft. dia. hex bin
 1—15 x 24 Universal jaw crusher
 1—28S Ransome concrete mixer
 1—10S Jaeger concrete mixer
 2—D8 tractors with dozers
 1—complete shovel attach. for Bucyrus-Erie 37-B, 1 1/4 - 1 1/2 yd.
 3700—ft. 18" Spiralweld pipe with couplers
 11—Deepwell turbine pumps, 8" to 12", with motors
 1—100 HP. Sauerman drag scraper hoist, 2 drum
 1—40 HP. Clyde Hoist, 2 drum
 Various Electric Motors 10 to 250 HP., transformers, centrifugal pumps 10 to 50 HP. and other equipment.

THE GORDON CONSTRUCTION COMPANY
 1900 - 31st Street Denver, Colorado

EUCLIDS FOR SALE

One bottom dump, Model 5LDT, 21 yard Cummins supercharged diesel engine. One bottom dump, Model 9FDT, 13 yard Cummins diesel engine. Both Units reconditioned.

RIVERS & SONS
 P. O. BOX 29 OKMULGEE, OKLA.

FOR SALE

Nearly New Complete Shovel Front for Link Belt K 40 or 45 Machine, 23 ft. boom—16 ft. Sticks Chain Crowd. 1 1/4 yd. Amsco Dipper. Inspection invited. Half price.

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 1361 South 2nd West Salt Lake City 8, Utah

1—5000 lb. Cap. Lidgerwood Sgl. Drum Elec. Hoist Drum 54" x 20" F. x 5 1/2" Flg. Dbl. Reduction. Rope speed 850 FPM, Motor G.E. 250 HP for 440/3/60 AC. with magnetic contactor. Post brake.
 1—200 HP. GE Motor complete with operating control all for 2200/3/60 AC. Speed 600 RPM, all in good operating condition.
 1—8000 lb. Cap. Ottumwa Hoist with 100 HP motor. 2200/3/60 AC.
 1—12000 lb. Lambert Hoist with 150 HP motor, 440/3/60 AC.
 1—2 Yd. Manitowoc Strip Shovel, Diesel operated.
 1—3 Yd. Lima Diesel D/L Crane 80' boom. Light Plant.
 1—25 ton, 3 drum elec. stiff leg derrick, 90' boom.
 1—6 ton 3 drum elec. stiff leg derrick, 90' boom.
 1—300 HP. Westinghouse Slip Ring Motor, high torque type, completely rebuilt for 440/3/60 AC.
 3—4000 lb. Dbl. Drum National Tugger Hoists for 220/440/3/60 AC.
 10—New 50 ft. Appleton 3 cond. Reelite Cable Reels.
 3—New 2000 lb. Cap. Shepard Form 8-T Elec. Hoists, 110/1/60 AC. 104 ft. lift.

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Eight Practically New MACK MODEL 8D 10 TON TRACTORS

169" W.B., 12:00 x 24 TIRES AROUND, TANDEM DRIVE, MACK MODEL EY ENGINE, 707 CU. IN. DISPLACEMENT, 175 H.P., WITH MCCOY BOTTOM DUMP 14.72 CU. YD. TRAILERS, TRAILER TIRES 18:00 x 24, AIR BRAKES, ALL IN EXCELLENT CONDITION.

TRACTOR AND TRAILER COMBINATION UNIT EACH.....\$7500.00

CONSTRUCTORS EQUIPMENT CO.

3707 DOWNING STREET

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Corrugated Pipe For Sale

13,000 ft. 14 gauge 24" Corrugated Culvert with 2 oz. coating bearing Armco brand. Made in half-circle sections with flanges on each section so they can be bolted together to form complete circle. Sections are 26" long allowing for 2" overlap at joints. Sheets are packed 10 in a bundle, each bundle weighing about 262 lbs.

Write to

DON R. STEWART
 BOX 310, STOCKTON, CALIF.

NEW API 100 BBL. BOLTED TANKS

150—100 bbl., dia. 9' 2 3/4" x 8-0 1/2" High. 12 gauge thickness throughout. Each tank complete with bolts, gaskets, fittings, erection tools knocked down and crated one large box weighing 3198 lbs. Detailed packing list can be furnished upon request.

Location: Los Angeles, Calif. District.

HORWITZ PIPE & STEEL CO.
 PH. 2-9128 TULSA, OKLA.

NEW API 10,000 BBL. BOLTED TANKS

3—10,000 bbl.—Diameter 54' 11 1/2" x 24' 1 1/2". Detailed packing list and specifications furnished upon request. Each tank complete with bolts, gaskets, fittings, erection tools, knocked down and properly crated for domestic or export shipment.

Location: Los Angeles, Calif. district.

HORWITZ PIPE & STEEL CO.
 PH. 2-9128 TULSA, OKLA.

SALESMAN WANTED:

Large Rocky Mountain tractor dealer has opening for top flight tractor and compressed air sales engineer. Allis-Chalmers tractor experience preferred. Candidate must have had minimum ten years actual heavy machinery field sales experience. Man forty or under preferred. Salary, commission, liberal car mileage and expense account. Write full experience, details, stating when available to

BOX 1021

WESTERN CONSTRUCTION NEWS
 503 Market Street, San Francisco 5, Calif.

QUITTING BUSINESS?

Are you planning on selling your construction outfit? The certain method to reach all buyers and obtain the top prices for your equipment and real estate is to sell at auction. Exclusively auctioneers since 1921, experience in selling construction equipment and real estate, write or call for sale in any part of the United States.

FORKE BROS. & FICKE
 THE AUCTIONEERS

Telephone 2-1452

314 SHARP BLDG. LINCOLN, NEBR.

Superintendent Wanted

Capable of complete charge of diamond and calyx drilling and pressure grouting for Bull Shoals Dam. Housing available.

Forward complete experience record, family status, availability.

Salary commensurate with ability. Applicant must file within three weeks to be considered.

Ozark Dam Constructors

BULL SHOALS DAM PROJECT
 MOUNTAIN HOME, ARK.

Euclids—5 Model FDT-47W

9 YARD BOTTOM DUMP
 150 H.P. CUMMINS—21:00 x 24 DRIVE TIRES
 GOOD WORKING CONDITION.

BOX 1030, WESTERN CONSTRUCTION NEWS
 503 Market Street, San Francisco 5, Calif.

MECHANIC WANTED:

Large Rocky Mountain Allis-Chalmers industrial tractor distributor has opening for experienced tractor mechanic. Candidate must have had minimum of ten years tractor experience. Excellent wages and fine living conditions. Man under forty preferred. Write full references and experience to Box 1022, Western Construction News, 503 Market Street, San Francisco 5, California.

OPPORTUNITY SECTION

SOLVENT OIL PLANT

Bowser Filtering Equip., Detrex Solvent Still, Hillmore Reclamation Still, De Laval Centrifuge, Viking Pumps with GE Motors, weather proof and explosion proof starters and switches, and Stock Tanks. Plant can be used to re-process lubricating oil, naphthas, etc.

Detailed inventory available upon request.

HORWITZ PIPE & STEEL CO.

PH. 2-9128

TULSA, OKLA.

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.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

For Sale . . . New and Used Diesel Engines and Generator Units

All Sizes — Available for Immediate Delivery

Send Us Your Inquiries



DULIEN STEEL  **PRODUCTS, Inc.**

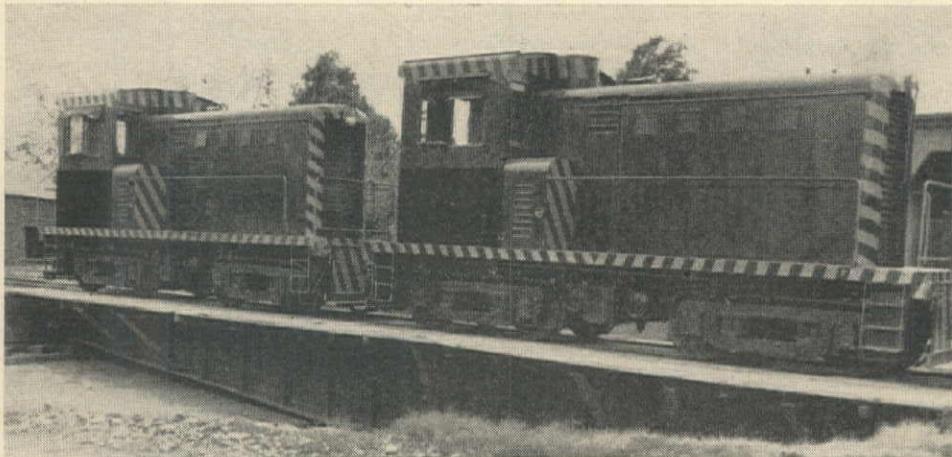
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9265 E. MARGINAL WAY • LANDER 6000 • SEATTLE 8, WASH.

Immediate Delivery

44 TON DIESEL-ELECTRIC LOCOMOTIVES!

New 1942 — Four (4) Traction Motors — Speed 40 M.P.H.



SPECIFICATIONS:

Wheelbase — (Truck) 7' 0"; Length over couplers 33' 10"; Height above rail 14' 1 1/2"; Radius of Sharpest Curve 50'; Maximum safe speed 40.7 M.P.H.; Drawbar Pull—27,000 lbs.; Diesel Unit—one Cooper-Bessemer Model EN, 310 HP at 900 RPM.; Westinghouse Electrical Equipment; Brakes—Westinghouse EL-14; Immediate Inspection Under Operation!

Two 50 Ton Steam Switchers New 1942

Type 0-6-0, side tank type, H. K. Porter steam switching locomotives, wheelbase 10', pressure 210 lb., tractive effort 21,360 lb., new 1942.

45 Ton Industrial Type, New 1941

One 300 HP, 45 ton diesel-electric locomotive, new 1941, Cummins diesel units, two Westinghouse Traction motors, tractive effort 27,000 lbs., speed 20 M.P.H.

Six 80 Ton 0-6-0 Steam Switchers New 1942-44

Six excellent switching locomotives comparing favorably with new units, 21 x 28" cylinders, tractive effort 40,000 lbs., at Texas, New York and California locations.

65 Ton 400 HP Unit New 1941

Type 0-4-4-0 GE Diesel-Electric new 1941, tractive effort 39,000 lbs., Hercules diesel units, maximum speed 40 M.P.H., located Missouri.

50 All Steel Fifty Ton Capacity Hopper Cars

All steel twin hopper cars, open top, self clearing, 50 ton capacity in good ICC interchange condition for immediate delivery.

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DALLAS, TEXAS

Two 50 Ton Fireless Steam Locomotives

FIRELESS Steam locomotives for plant switching, one built by Porter 1942, the other in 1937. Good condition. 22" x 18" cylinders, piston valves.

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Phoenix

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MacDonald Co.
Reno

Mahl Steel & Supply Co.
Los Angeles

Renfro Products Co.
Los Angeles