

WESTERN CONSTRUCTION NEWS

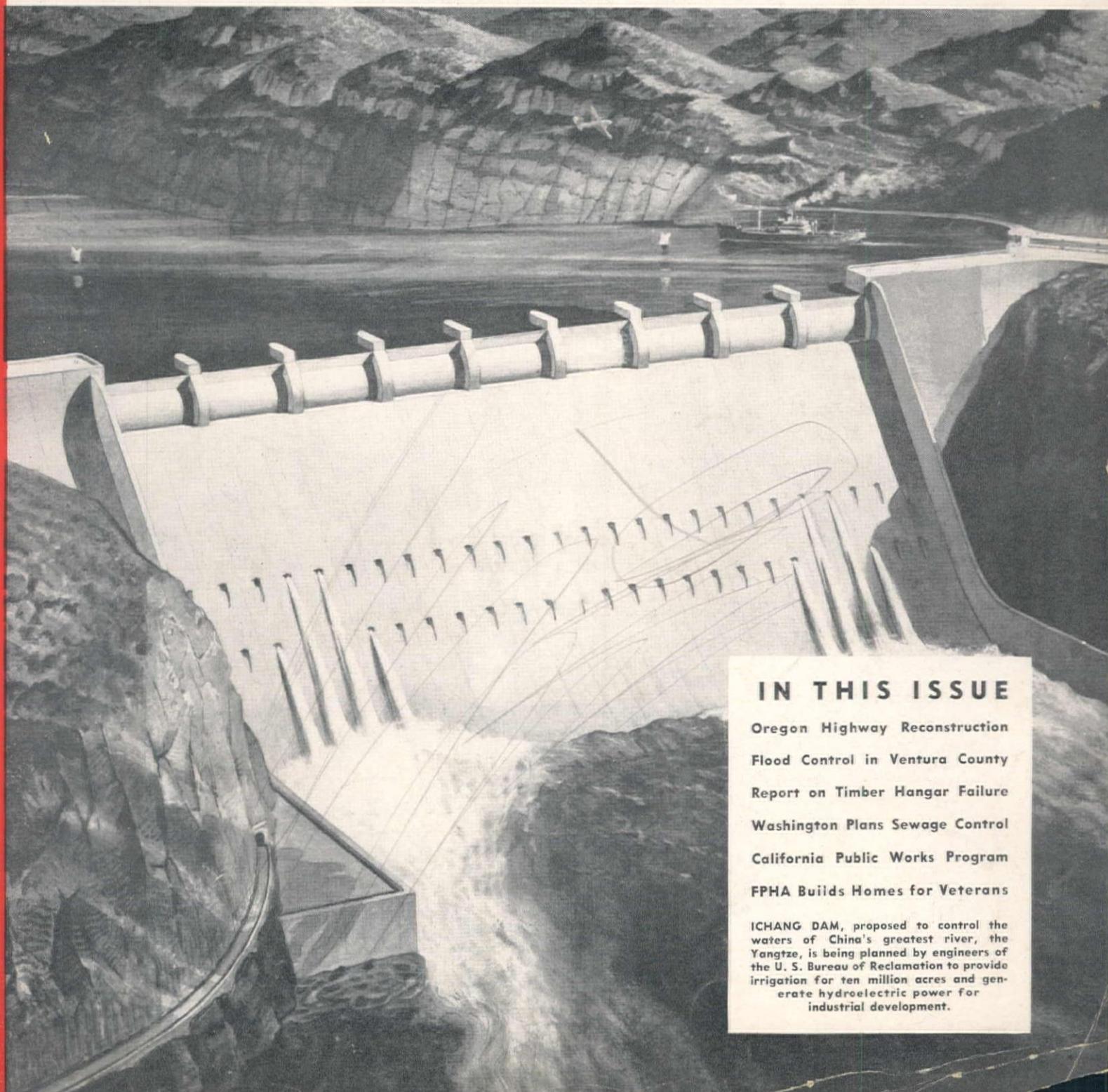
3/7
7/4
04 115th
03 103
08th 767
21 310
7/7 108

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

PUBLISHED MONTHLY
VOLUME XXI, No. 3

MARCH • 1946

35 CENTS A COPY
\$3.00 PER YEAR



IN THIS ISSUE

- Oregon Highway Reconstruction
- Flood Control in Ventura County
- Report on Timber Hangar Failure
- Washington Plans Sewage Control
- California Public Works Program
- FPHA Builds Homes for Veterans

ICHANG DAM, proposed to control the waters of China's greatest river, the Yangtze, is being planned by engineers of the U. S. Bureau of Reclamation to provide irrigation for ten million acres and generate hydroelectric power for industrial development.

HIT IT HARD



Hit it as hard as you can,
Marfak cushions the
blow, doesn't splatter —
stays in the chassis bear-
ings.

...find out why
**MAINTENANCE
COSTS LESS**



GREASE SPLATTERS

Even a light blow sends
ordinary chassis lubricant fly-
ing in all directions—leaving
parts unprotected.

THIS simple "hammer test" proves that *Texaco Marfak* is super-tough, adhesive and cohesive — stays right where you put it despite heavy loads and hammering shocks. It gives greater protection with fewer applications, makes parts last longer. That's why operators everywhere use *Marfak* to reduce maintenance costs.

To prolong the life of wheel bearings, use *Texaco Marfak Heavy Duty*. It stays in the

bearings despite high speeds, heavy loads and extremes of temperature — sealing out dirt and moisture, sealing itself in, assuring safer braking. No seasonal change is required.

For Texaco Products and Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street,
New York 17, N. Y.



TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON SUNDAY NIGHTS ★ METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS

WHEN THESE HIGHBALL ROAD JOBS START!

What are you going to have on the batcher plant? Better plan for a smooth operating, fast, Northwest!

The "Feather-Touch" Clutch Control makes operation easy, keeps the output curve up throughout the day, makes spotting the load faster and easier and reduces the banging up of the batch bin.

Uniform Pressure Swing Clutches eliminate the jerks and jars present with ordinary swing clutches and assure longer life, smoother operation, less time down for replacement or adjustment.

Northwest Crawlers give smoother travel. Front-end cab and window design provides for easy vision and there is a choice of boom hoists that provide for live boom operation independent of all other functions at the will of the operator. Everything has been incorporated to assure a smooth running job that will keep the plant ahead of the paver. There are 18 sizes—4 to 44 tons capacity!

Ask for further details.

NORTHWEST ENGINEERING CO.

1727 Steger Building
28 E. Jackson Blvd.
Chicago 4, Illinois

Every Third
NORTHWEST
is a repeat
order

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Northwest Sales Agents: ARNOLD MACHY. CO., INC., 149 W. 2nd South St., Salt Lake City, Utah;
BALZER MACHY. CO., 2136 S.E. Eighth Ave., Portland, Oregon;
WILSON EQUIPMENT SUPPLY CO., 902 West 22nd St., Cheyenne, Wyoming;
Branch Offices: 255 Tenth St., San Francisco, Calif.; 1234 Sixth Ave., South, Seattle, Wash.;
3707 Santa Fe Ave., Los Angeles, Calif.; 3015 C St., Denver, Colo.

EUCLIDS

have the Backbone to take it

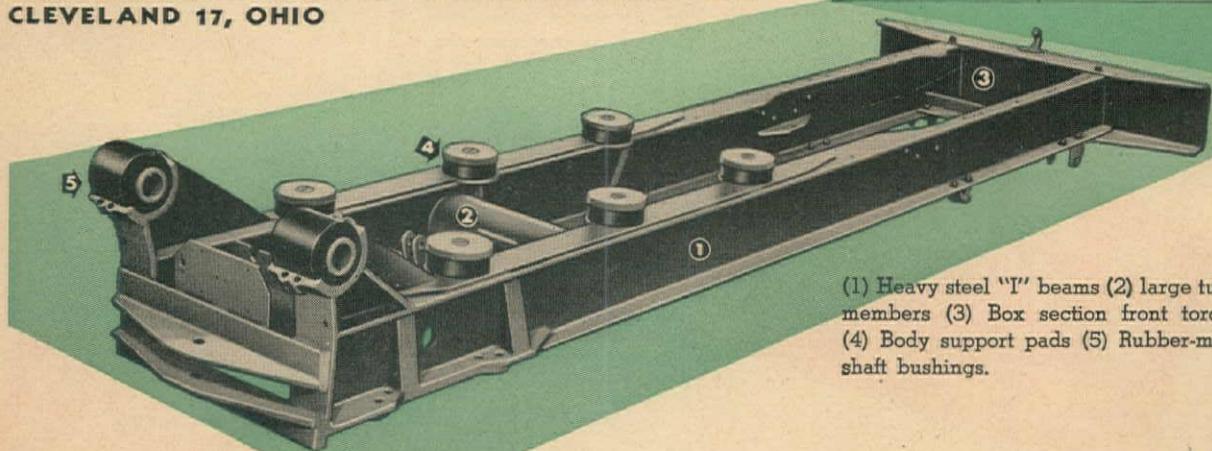
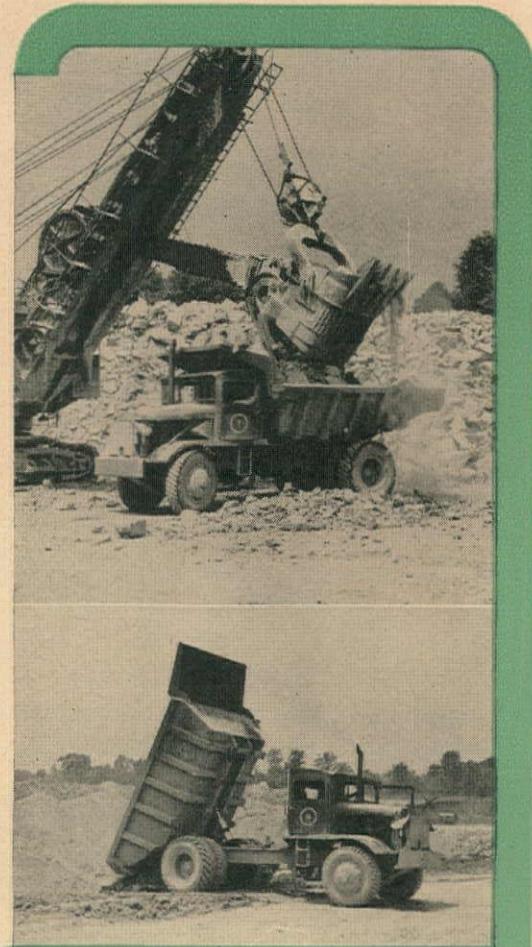
A FRAME OF UNMATCHED STRENGTH

• Hauling equipment used in off-the-highway work must be designed and built to move large loads over difficult haul roads at low cost. It must have rugged "staying power" for the hard usage and varying conditions of mining, construction and quarry operations.

The strong, rigid frame is the backbone of the Rear-Dump Euclid, the hauling unit that has proved its dependable, low cost performance on hundreds of the toughest jobs. Constructed of wide-flanged, deep sectioned "I" beams stiffened by large tubular and box section torque members, the Euclid frame is built to last for the life of the truck. The body is cushioned on large rubber support pads which absorb the heavy impacts of loading and hauling over rough roads . . . there is no metal to metal contact between the body and frame.

Ask your Distributor to show you how all Euclid models, Rear-Dump and Bottom-Dump, are built *throughout* for long lasting, efficient off-the-highway service.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO



(1) Heavy steel "I" beams (2) large tubular torque members (3) Box section front torque member (4) Body support pads (5) Rubber-mounted pivot shaft bushings.



EUCLIDS

  Move the Earth



Brown, Fraser & Co., Ltd., Vancouver; Columbia Equipment Co., Portland; A. N. Cox & Co., Seattle; Hall-Perry Machinery Co., Butte; Intermountain Equipment Co., Boise & Spokane; The Lang Co., Salt Lake City; Lively Equipment Co., Albuquerque; Constructors Equipment Co., Denver. Factory Branch: 3710 San Pablo Avenue, Emeryville, California.

WESTERN CONSTRUCTION NEWS

*Covering
the Western Half of
the National
Construction Field*



J. M. SERVER, JR.
Editor

SUBSCRIPTION RATES

The annual subscription rate is \$3 in the United States and foreign countries where extra postage is not required. To Canada and to foreign countries where extra postage is necessary the annual rate is \$4. Single copies, 35 cents.

Contents for March, 1946

Editorial Comment	87
Oregon Highway Section Modernized	89
By K. D. LYTHE	
Flood Control Planned for Ventura River	93
By E. L. CLARK	
Timber Blimp Hangar Failure Examined	96
Stream Pollution Program of Washington State	100
By JACK TAYLOR	
Huge Public Works Program for California	102
FPHA Plans for Relieving Housing Shortage	104
1946 Officers for Western Associations	109
How It Was Done	112
News of Western Construction	114
Unit Bid Summary	126
Construction Contracts Awarded During February	135
New Equipment and News of the Men Who Sell It	156

Published Monthly by King Publications

OFFICE OF PUBLICATION
503 Market St., San Francisco 5, Calif. Telephone YUkon 1537

SOUTHWEST OFFICE
3835 Wilshire Blvd., Los Angeles 5 Telephone FAirfax 2301

J. E. BADGLEY, District Manager

MIDWEST OFFICE

5833 So. Spaulding Ave., Chicago 29, Ill. Telephone PRospect 1685

A. C. PETERSEN, District Manager

EASTERN OFFICE

117 Hartwick Street, Maywood, N. J. Telephone Hackensack 2-2914W

R. E. DORLAND, District Manager

WASHINGTON OFFICE

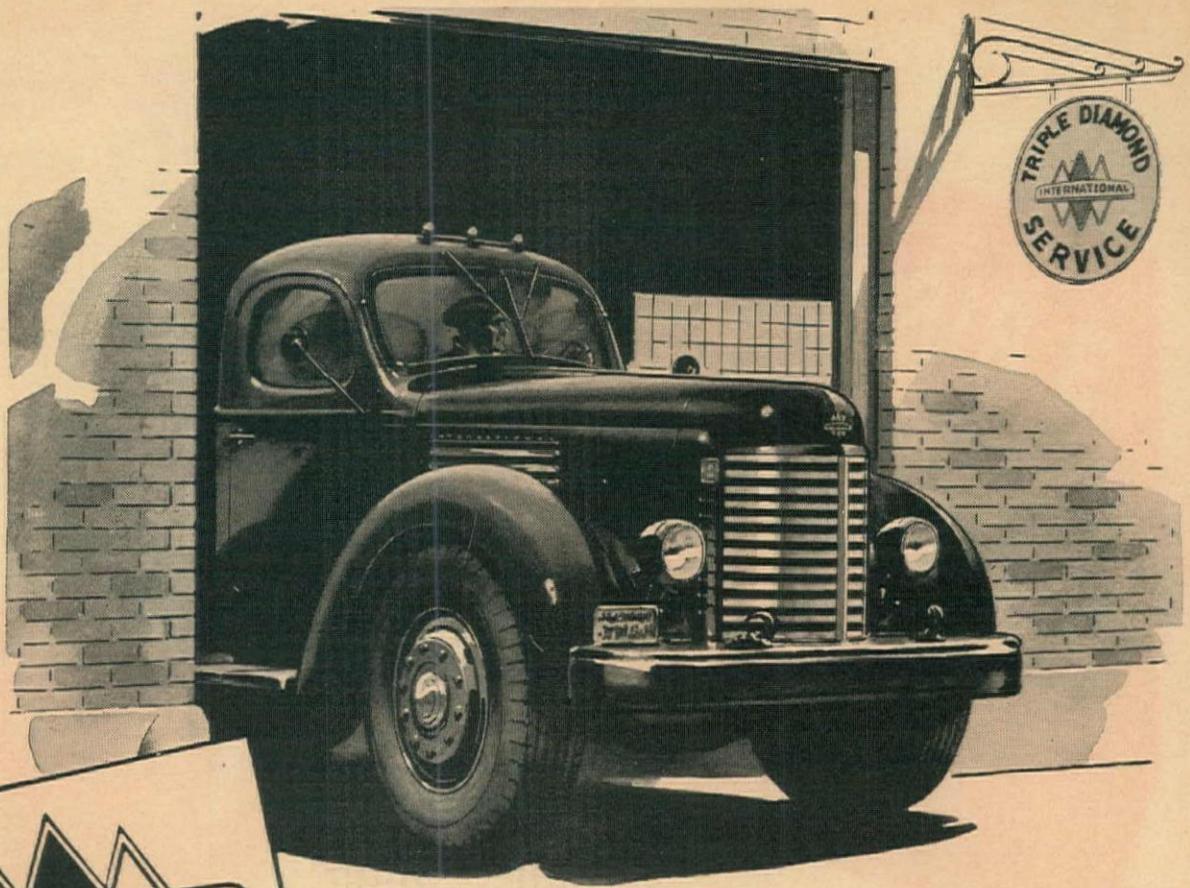
1120 Vermont Ave., NW., Washington 5, D. C. Telephone District 8822

ARNOLD KRUCKMAN, Associate Editor

Please address correspondence to the executive offices, 503 Market St.,

San Francisco 5, California

Entered as Second Class Matter at the Post Office in San Francisco, California, under the Act of March 3, 1879. Copyright, 1946, by King Publications.



This emblem identifies the nation's largest company-owned truck-service organization—International Branches—and International Truck Dealers everywhere.

5 Reasons Why INTERNATIONAL SERVICE Can Help You Meet Rising Truck Operating Costs

1. Mechanics who furnish International Service are *truck* mechanics—specialists in truck service.
2. They are trained in International shop methods.
3. They are kept constantly informed of all improvements in maintenance and service practices.
4. They use International-approved equipment for analysis and testing.
5. They install International factory-engineered parts.

International Truck Service is supplied by a national network of International Truck Dealers and by International Branches—the nation's largest company-owned truck-service organization.

Listen to "Harvest of Stars" every Sunday. NBC Network

In the present critical truck situation, International Truck Service is your best bet to keep operating costs at practical levels and to minimize chances of highway failures. You will find an International Branch or Truck Dealer within easy driving distance. Get in touch with him today.

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



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



INTERNATIONAL Trucks

3 BIG REASONS

why "MORE YARDS ARE MOVED ON

GOOD YEAR

OFF-THE-ROAD TIRES
THAN ON
ANY OTHER KIND"

2 ALL-WEATHER
EARTH MOVER
SURE ROLL — for drawn
vehicles and general
purpose traction

1 SURE-GRIP
EARTH MOVER
for SUPER TRACTION on
drive wheels

3 HARD ROCK LUG
SUPER ARMORED — for all
rough and rugged rock work

BUY and SPECIFY GOOD  YEAR — it pays!

Sure-Grip, All-Weather—T. M.'s The Goodyear T. & R. Co.

Better Trucks for YOUR Business!

TRUCK-ENGINEERED • TRUCK-BUILT • BY TRUCK MEN



"Our 20 Ford Units Stay on the Job"

It doesn't take long for the profit on a job to vanish, if truck equipment can't stand the pace. That's why the rugged reliability and endurance of Ford Heavy Duty Trucks have made them such favorites in the construction field as well as on street and highway work.

Contractor C. W. Shirey, of Waterloo, Iowa, is strong for Ford Trucks. He wrote recently:

"The splendid way we've been able to maintain our Ford units, handling ready-mix concrete deliveries, for the last ten years, has been very

gratifying. Eleven of our twenty Ford units carry mixer equipment, and they've been going every day, long hours—especially all through the war period. Through the service given by our Ford dealer, we've kept them running, and kept tie-ups to a minimum. Rest assured we'll continue to use Ford units."

The new Ford Trucks are better than ever—engineered for more economy, more reliability, longer life. There's a new Ford Heavy Duty Dump Truck chassis that's a stand-out value. Ask your Ford Dealer about it!



ADVANCED ENGINEERING IN NEW FORD TRUCKS

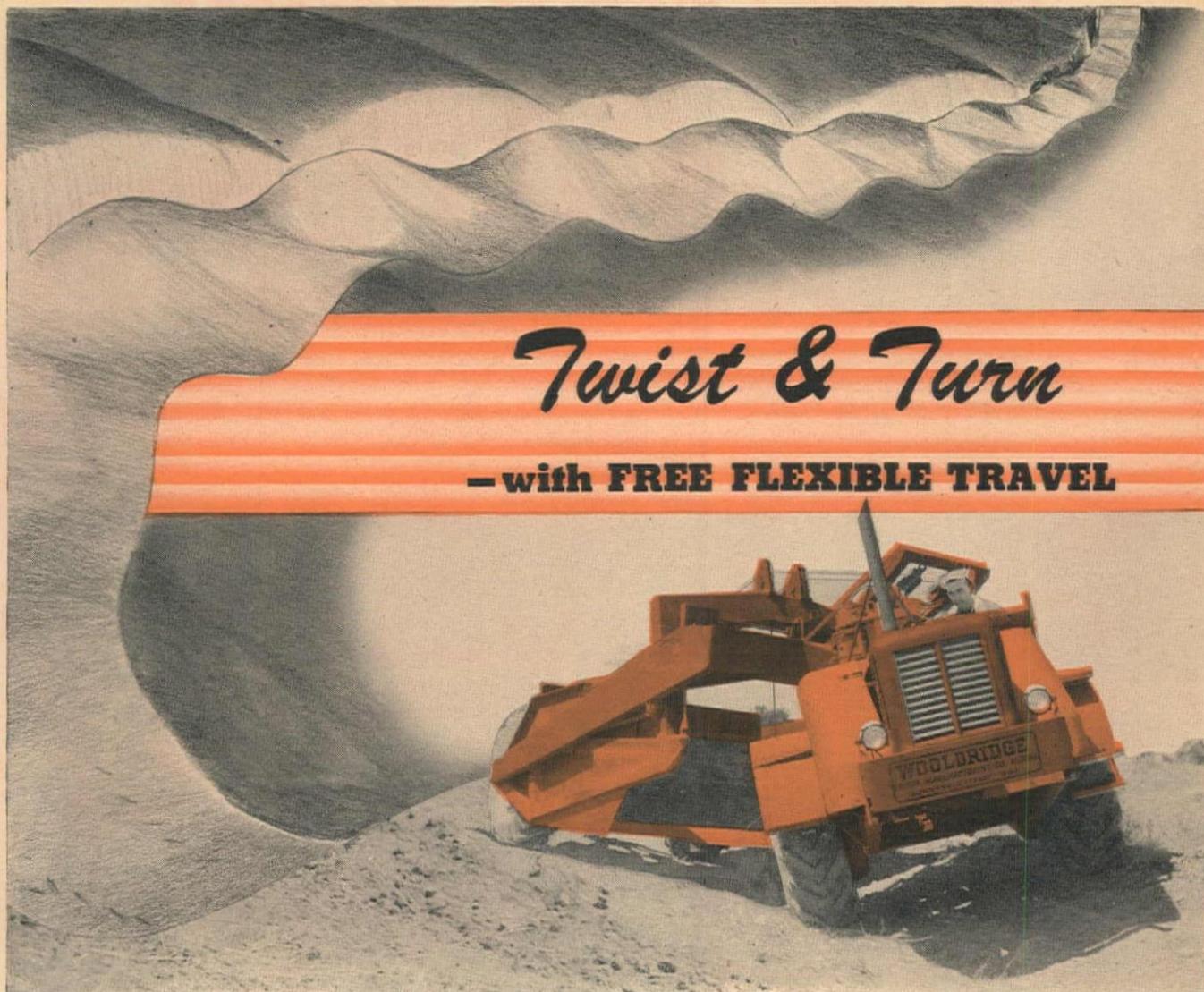
*More Economy and Endurance
Easier Servicing*

A STILL GREATER 100 HP V-8 ENGINE with NEW Ford steel-cored Silvaloy rod bearings, more enduring than ever in severe service • NEW aluminum alloy cam-ground 4-ring pistons for oil economy • BIGGER, more efficient oil pump and IMPROVED rear bearing oil seal • NEW longer-lived valve springs • NEW improvements in cooling • NEW efficiency in ignition • in carburetion • in lubrication • in ease and economy of servicing operations • And available in all truck chassis except C.O.E. units—the rugged, thrifty 90 HP FORD SIX-CYLINDER ENGINE, with many important advancements.

FORD CHASSIS ADVANTAGES: Easy accessibility for low-cost maintenance • Universal service facilities • Tough, forged front axles • Extra-sturdy rear axles with pinion straddle-mounted on 3 large roller bearings, $\frac{3}{4}$ -floating type in light duty units, full-floating in all others • 3 axle ratios available (2 in 1-ton unit) • 2-speed axle available in heavy duty units at extra cost • Powerful hydraulic brakes, large drums, cast braking surfaces • Rugged 4-speed transmission with NEW internal reverse lock optional at extra cost on light duty units, standard on all others.

FORD TRUCKS

MORE FORD TRUCKS ON THE ROAD • ON MORE JOBS • FOR MORE GOOD REASONS



WOOLDRIDGE

EARTHMoving EQUIPMENT

Includes



★ **SCRAPERS**

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



★ **POWER CONTROL UNITS**

Single and multiple drum with universal or roller fairleads.



★ **BULLDOZERS**

Tough and rugged design for standard makes of tractors.



★ **TRAILBUILDERS**

Adjustable angle-blades for standard tractor mounting.



★ **RIPPERS**

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

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

over ROUGH GROUND

Higher travel speeds can be maintained over rough, rocky or rutty surfaces due to the free floating action of the single King-Pin on Wooldridge Terra-Cobras.

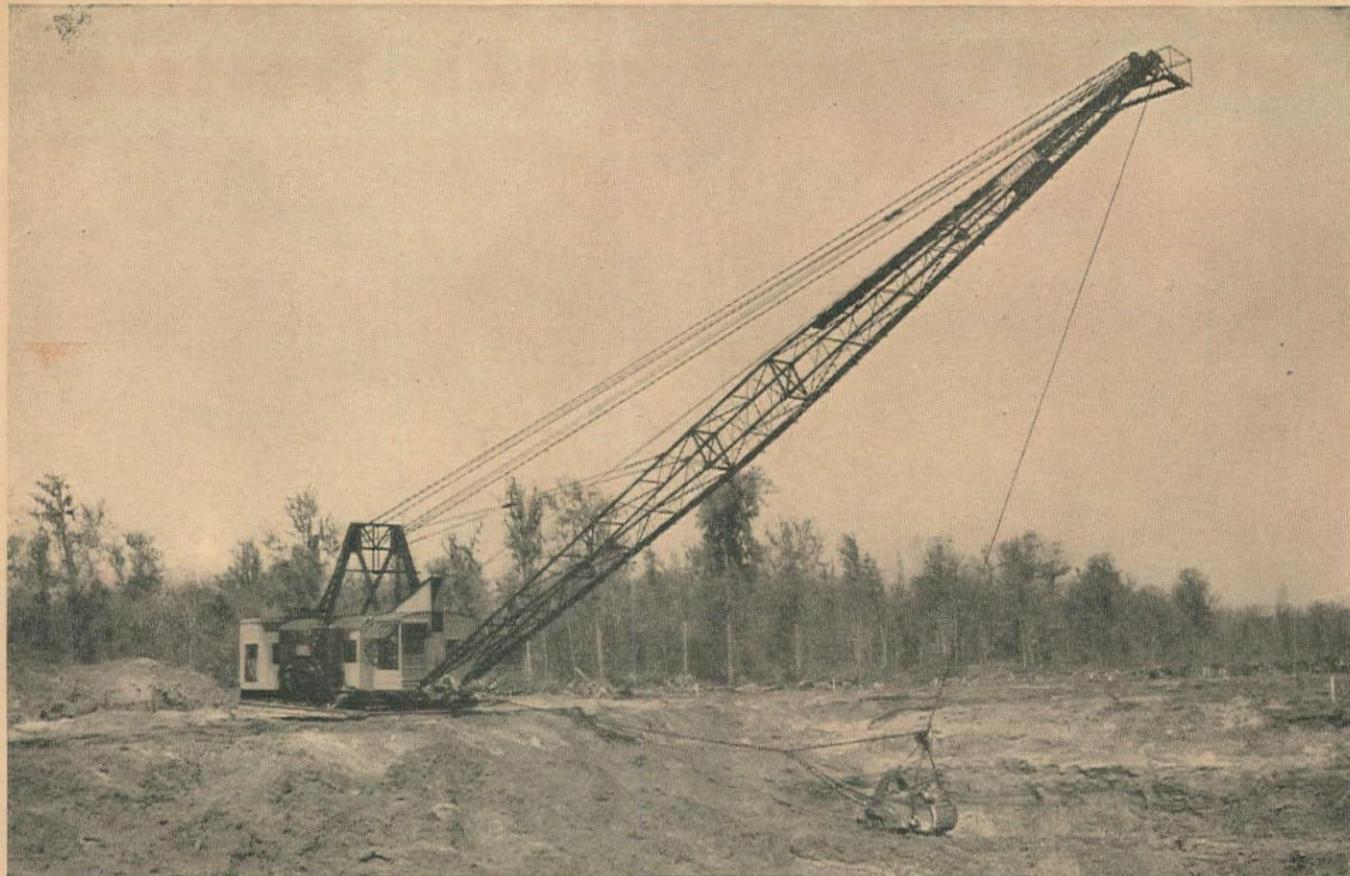
Either unit can tilt while the engine unit freely turns in either direction with no danger of "jacknifing." Positive steering control further permits operator to set and maintain a true course of travel at all times—and at all speeds. Increased yardages per hour, per shift, per day result. To speed up your operations investigate Wooldridge Terra-Cobras, today.

WOOLDRIDGE
MANUFACTURING COMPANY

SUNNYVALE, CALIFORNIA - U.S.A.

TERRA COBRA

Hi-Speed Self-Propelled EARTHMOVERS



Good for **MILLIONS** of Yards



Available with
booms up to 250
ft.; buckets up to
50 cu. yards.

Sold by

Smooth walking action and simple durable machinery —these are big reasons why you can count on Bucyrus-Monighan walking draglines for fast dependable service throughout a "life" of millions of yards of output.

Over rough ground or soft, Bucyrus-Monighans walk smoothly, cushioning down their weight evenly with each step, without the bumps or jars that cause destructive stresses. That's why their walking action lasts . . . why they step out safely, positively, and gently even after moving 15 or 20 million cubic yards. Their "years ahead" digging speed and smoothness lasts, too, because machinery design has the simplicity that keeps maintenance requirements low, digging efficiency high through many years of hard service.

3M45

BUCYRUS - ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN.

Excavate at New Low Cost with INTERNATIONAL Tractors



THE use of International Diesel TracTractors for digging basements and other excavations is a distinctly advanced practice. Costs are lowered materially; the work is speeded; time is saved. Many operators who have specialized in excavation work with TracTractors enjoy a remarkable volume of business because of these advantages.

In homesite subdivision developments, whole blocks of basements are often excavated in one operation by a single International Crawler!

The International TD-14 TracTractor shown in the photographs is owned by a basement specialist in the midwest. At this particular site, it was excavating 420 cubic yards of clay. Average depth was 6 feet. Average distance from cut to spoil was 60 feet. Time required to complete the excavation was 6½ hours.



TRACTRATORS



POWER UNITS



WHEEL TRACTORS



INTERNATIONAL

Industrial Power

International Diesel TracTractors are instant-starting, fast-working and dependable, *full-Diesel* crawlers that get work done at lowest cost with minimum maintenance. Check up on the new tractors and matched equipment now available through the International Industrial Power Distributor near you.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

DISTRIBUTORS

J. G. Bastain, Redding, California
Brown Motors, Reno, Nevada
Brown Tractor Company, Fresno, Madera, Reedley, California
Stanley J. Commerford, Eureka, California
Farmers Mercantile Company, Salinas, California
Sutton Tractor & Equipment Co., Sacramento, California
Thompson-Saga, Inc., Stockton, California
Valley Equipment Co., San Jose and San Francisco, California

Clark Bros.

SUBJECT: TORQUE CONVERTER TRACTOR
OWNER: CLARK BROS. CONSTRUCTION CO., Hinton, Iowa

PURCHASED
JULY, 1941

AUGUST 20, 1943.
Only a partial Overhaul
after 6,100 HOURS
OF OPERATION.

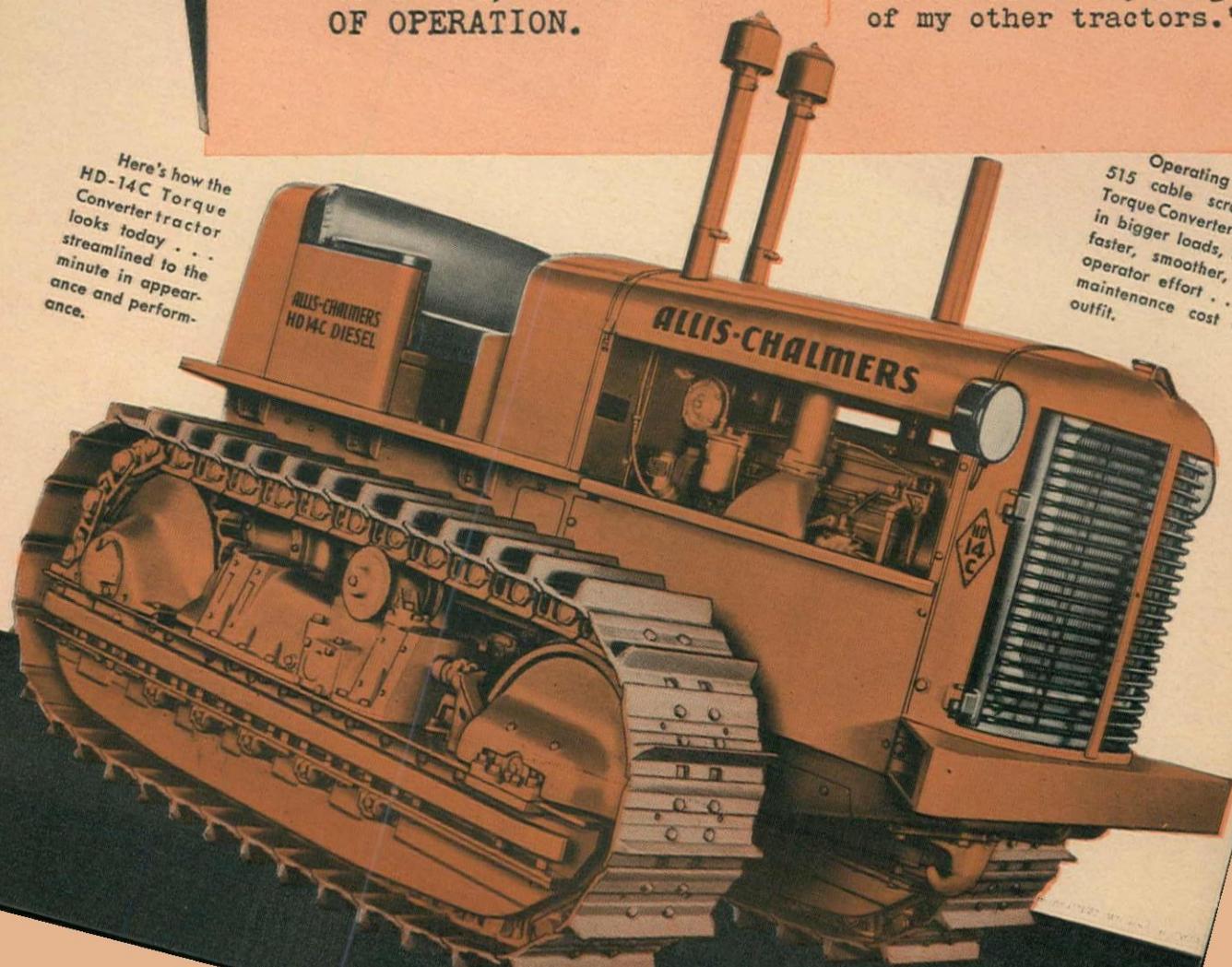
MARCH 24, 1945.
First Complete Overhaul,
after 14,000 HOURS
OF OPERATION.

Owner's opinion at this time--
"The Torque Converter is won-
derful. It's easy on the trac-
tor--operation is smooth, no
jerking. Original master
clutch is still on the tractor
--in fact, we've never even
taken up on the clutch!"

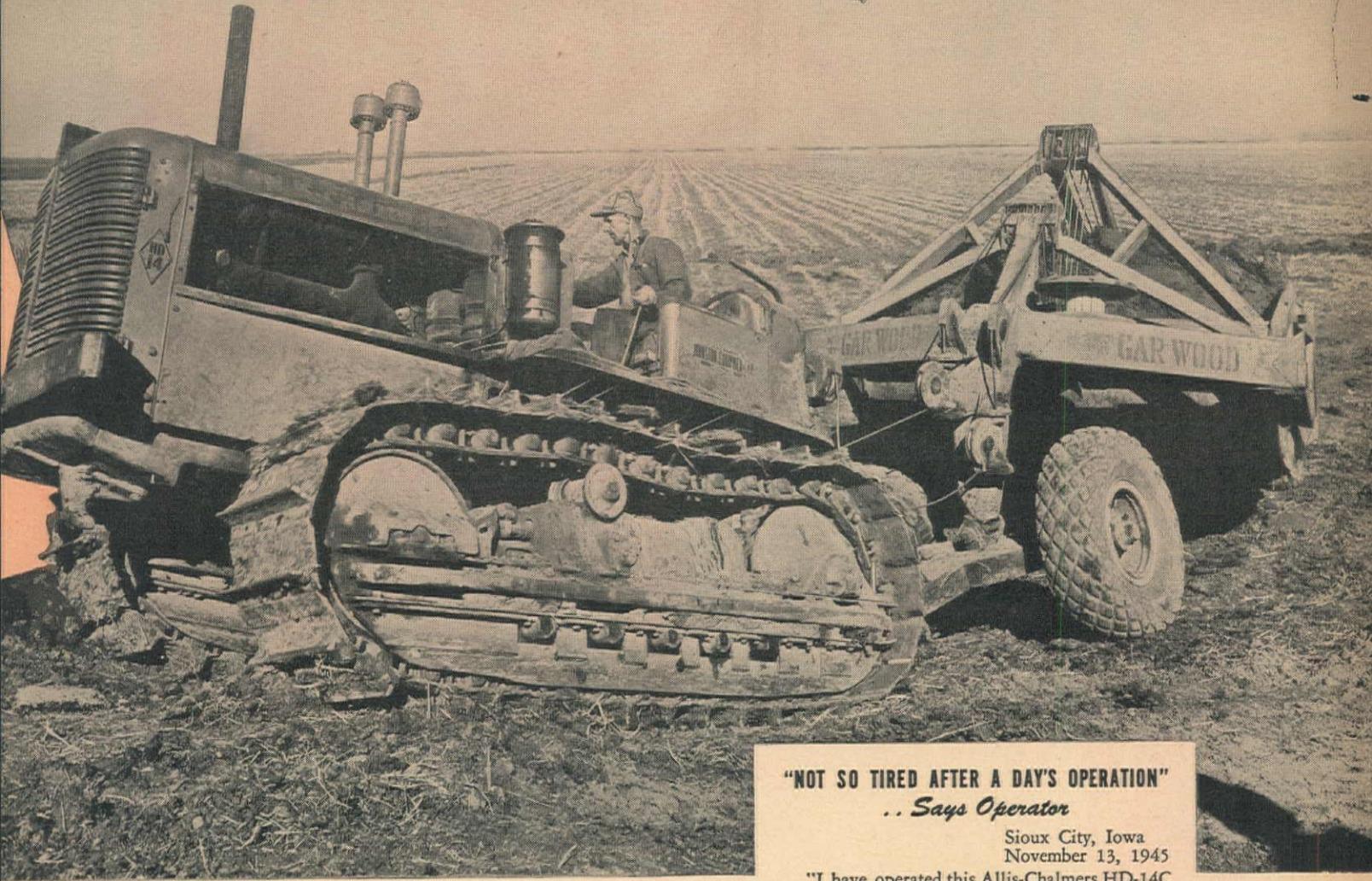
Said the owner then--"I am most
pleased with the service record
of the Allis-Chalmers Torque
Converter Tractor. Besides, it
has moved more yardage than any
of my other tractors."

Here's how the
HD-14C Torque
Converter tractor
looks today . . .
streamlined to the
minute in appear-
ance and perform-
ance.

Operating the Gar Wood
515 cable scraper, Clark's
Torque Converter tractor packs
in bigger loads, moves them
faster, smoother, with less
operator effort . . . reduces
maintenance cost of entire
outfit.



Let the Record Speak!



"NOT SO TIRED AFTER A DAY'S OPERATION"

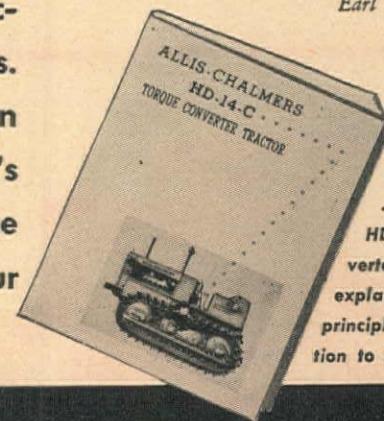
... Says Operator

Sioux City, Iowa
November 13, 1945

"I have operated this Allis-Chalmers HD-14C Tractor for over four years for Mr. Clark of the Clark Construction Company, Hinton, Iowa, and will say that the Torque Converter has it all over the gear type tractors. It has much smoother power and does more work. It is a lot easier to operate than the old tractor.

"I do not feel as tired at night after operating this tractor without all of that gear shifting."

Earl King, Operator



FREE!

Write for this book
... "Allis-Chalmers
HD-14C Torque Con-
verter Tractor" ... fully
explains torque converter
principle and its applica-
tion to the HD-14C.

CLARK BROS. was one of many to test the HD-14C, Torque Converter tractor. All were told to "give it the works." It has proved itself everywhere . . . OUTSERVICED, OUTPRODUCED conventional tractors under the most severe operating conditions. You can be sure you aren't experimenting when you put the Torque Converter tractor to work. It's a thoroughly TESTED, FINISHED PRODUCT . . . the tractor of the times! Get all the facts from your Allis-Chalmers dealer . . . NOW!

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

On the job-- DIGGING
AT A PROFIT!

HENDRIX
Lightweight
**DRAGLINE
BUCKETS**

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

3/8 to 30 Cubic Yds.



We've taken the weight out of the bucket itself, to let you put bigger loads inside. Here's how: Because the HENDRIX Lightweight is 20 to 40 per cent lighter than other buckets, type for type, you can use larger buckets on your machines, designed for smaller operations. The same holds true for long boom operations... and in either case this can be done without exceeding the allowable loaded weight. In wet digging, you get bigger pay loads by leaving the water in the pit!

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

WRITE FOR DESCRIPTIVE LITERATURE—
OR ASK YOUR DEALER

DESO TO FOUNDRY, INC. • MANSFIELD, LOUISIANA



FWDs MAKE THE MOST OF *Truck* POWER AND *Man* POWER

In everyday duty on highway construction and maintenance, FWDs regularly do 61 jobs. Including special jobs, there are more... write for list. For all year 'round highway work, you can always depend on FWDs.

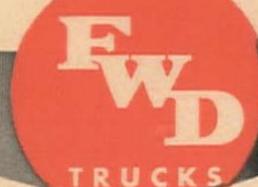
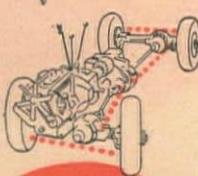
FWD trucks... rugged, reliable, modern... embody the highest development of the original four-wheel-drive principle, pioneered and advanced by FWD since 1910. The true FWD principle with

center differential and properly balanced power on all wheels, gives these trucks outstanding mechanical advantages and highway performance leadership... the FWD principle that provides the power and stamina to get through, regardless of weather, road conditions, or lack of roads, with greater assurance and safety. Balanced weight distribution on all four wheels conserves precious tires, replacements, oil and gas.

As leaders in performance, economy and style, FWDs are a great "buy" for highway service. Their value is so widely recognized that they outnumber all other four-wheel-drives 4 to 1 in this field of heavy-duty truck work.

THE FOUR WHEEL DRIVE AUTO COMPANY, Clintonville, Wisconsin

Canadian Factory: Kitchener, Ontario



THE ORIGINAL EXCLUSIVE BUILDERS
OF FOUR-WHEEL-DRIVE TRUCKS

More than \$75,000,000
in purchases of FWD
Model SU alone
in the comparatively
short span of forty-
eight months, empha-
sizes FWD leadership
in this field!

FWD Distributors

FWD'S

ARIZONA—Arizona-Cedar Rapids Co., 401 N. First St., Phoenix; CALIFORNIA—Hillman-Kelley Company, 1000 Macy St., Los Angeles and FWD Pacific Co., 469 Bryant St., San Francisco 7; COLORADO—Liberty Trucks & Parts Co., P. O. Box 1889, Denver 1; IDAHO—Intermountain Equipment Company, Broadway at Myrtle St., Boise; MONTANA—Steffeck Equipment Co., 11 E. Cutler St., Helena; NEVADA—Allied Equipment Co., Reno; NEW MEXICO—The Myers Company, Las Cruces; OKLAHOMA—Halliburton Oil Well Cementing Co., P. O. Drawer 471, Duncan and Oklahoma Road Mach. Co., Muskogee; OREGON—Feenauty Machinery Co., 112 S. E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th St., Salt Lake City; WASHINGTON—Feenauty Machinery Co., 1028 6th Ave. So., Seattle 2, and Feenauty Machinery Co., 715 N. Division St., Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne.

then he said to himself:

"Beat their brains IN...not out"



AGED Japanese Diet member, YUKIO OZAKI, lifelong champion of parliamentary government, recently called upon his colleagues to resign rather than persist in blind obedience to government. Said he:

"Our people of today do not know right from wrong. We must pour into their heads the law of humanity and the difference between right and wrong."

The difference between the right way of doing things and the wrong way would seem an easy thing to knock into heads,

—but even here in America it sometimes takes KNOCKS like that of the SHERIFF to awaken interest;

—while with others the gentle KNOCK of OPPORTUNITY spurs them to deeds for the good of all.



"The difference between **RIGHT** and **WRONG**"...he says

LOOK, OZAKI... Here is the difference between **RIGHT** and **WRONG** in making a down-hand butt weld in $\frac{3}{8}$ " plate:

WRONG

4 PASSES

PROPORTION OF
ELECTRODE METAL
AND
PLATE METAL



2" OF JOINT PER MIN.

RIGHT

2 PASSES

PROPORTION OF
ELECTRODE METAL
AND
PLATE METAL



9" OF JOINT PER MIN.

CONVENTIONAL TECHNIQUE ...

$\frac{3}{8}$ " plate. 60° bevel. $\frac{1}{16}$ " gap. 1st pass (sealing bead): $\frac{3}{16}$ " "Fleetweld 5", 150 amps. 2nd, 3rd, 4th passes: $\frac{1}{4}$ " "Fleetweld 5", 250 amps.

"FLEET-WELDING" TECHNIQUE ...

$\frac{3}{8}$ " plate. No plate beveling. 1st, 2nd passes: $\frac{5}{16}$ " "Fleetweld 5", 450 amps. Increases welding speed 350%. Cuts deposited metal 50%.

DIFFERENCE: 75¢ on the dollar

The "Fleet-Welding" technique uses "arc force" to reduce the amount of deposited metal and increase the rate of deposit. Also, in some cases, such as the butt weld shown, it eliminates plate beveling. Results for this joint: strength equals that of conventional weld; deposited metal is cut 50%; welding speed is increased 350%; cost is cut 75%.

For all types of joints, in all positions: "Fleet-

"Welding" procedures for all applications in mild steel plate and sheet are given in handy pocket manual, Bul. 444. Free on request. Ask for it on your business letterhead.

The **RIGHT Ways to Control Distortion**

The new Lincoln sound-color movie, "The Prevention and Control of Distortion in Arc Welding", by Walt Disney Productions, explains simply and clearly the causes and cures of distortion. A valuable aid to designers and production men. Available free for showing to groups. Ask for Bul. 709.

THE LINCOLN ELECTRIC COMPANY
Dept. W-1 Cleveland 1, Ohio

America's greatest natural recourse

ARC WELDING

Claims Are More Than Clai They're Backed By Proof Like

*Here are
some of the
claims we
make for*
**MISSISSIPPI
WAGONS**

Check each of these statements against the owner report opposite . . . one of the many we have received testifying to the economy and versatility of Mississippi Wagons. Performance records like this are your guarantee that Mississippi Wagons have what it takes to handle your hauling jobs, at costs that will assure you of maximum profits.

1. Since the tractor is not subjected to the pounding and surging of the loaded trailer, a minimum of repairs are necessary during the life of the unit, resulting in more actual operating hours per month or year and in greatly decreased repair expense.
2. Repair parts are low in cost. The list price of all gears, bearings and shafts in the five-speed transmission is only \$188.99; of all wearing parts in the rear axle and differential, only \$315.95.
3. Short or long hauls, on or off the highway—it's all the same to versatile Mississippi Wagons.
4. The Mississippi Wagon is the only bottom-dump unit powered by a long-life industrial tractor that can haul payloads of 27,000 pounds over highways without exceeding the 18,000-pound axle-loading limit set by most state laws.
5. Mississippi Wagons provide greater flotation than semi-trailer units of the same capacity and will therefore travel over spongier ground. For the same reason, they will travel over black-top and other types of pavement without damage to the road surface.

M-R-S MANUFACTURING COMPANY, Jackson, Mississippi



ms, When
This!

Write us, or consult your nearest distributor, for full information on Mississippi Wagons and recommendations as to which type or types will serve you most profitably.

E. R. MORRIS

H. M. YOUNG, JR.

MORRIS & YOUNG

CONTRACTORS

La. Nat'l. Bank Bldg.
BATON ROUGE, LA.

September 12, 1945

Dunham-Pugh Company
Baton Rouge, Louisiana

Gentlemen:

I am pleased to give you the information requested on the four Mississippi Wagons we purchased from you on July 11, 1944.

During the first fourteen months we have owned these four Mississippi Wagons we have operated them approximately 3490 hours per unit with a repair parts bill of \$1099.87 on the tractors and \$181.65 on the trailers—a total of \$1281.52 for the four units, or \$320.38 for each unit.

In other words, our repair parts costs have been 9 and 18/100 cents an hour per unit, and the units are still in good operating condition, using about the same amount of fuel and oil they have always used.

During this fourteen months we have hauled the following quantities of material for the distances shown:

240,000 yards of dirt	average haul	$\frac{1}{2}$ mile
42,000 yards of gravel	average haul	8 miles
28,000 yards of gravel	average haul	10 miles
18,000 yards of shell	average haul	5 miles

We are now back on our dirt job at Lottie, Louisiana, finishing it up. Last winter's rains made it necessary for us to leave it as the ground conditions were quite bad, since the water level is only five feet underground on the job site.

It was very pleasing to us to have hauling equipment that permitted our taking contracts for gravel and shell hauling during those winter months, instead of having to scatter our organization and let our equipment stand idle.

In addition to their low maintenance cost and their suitability for both on or off the highway use, we are very pleased with the ability of our Mississippi Wagons to work under soft ground conditions, and with their ease of handling, operator comfort and simplicity.

I trust the above gives you all of the information requested.

Very truly yours,

MORRIS & YOUNG, CONTRACTORS

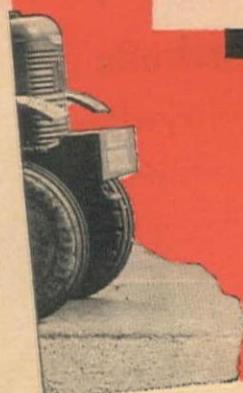
E. R. Morris

ERM/J

E. R. Morris

MISSISSIPPI WAGON

The World's Most Modern Hauling Unit



**FOR A QUICK SOLUTION
TO YOUR MATERIAL
HANDLING PROBLEM
CALL IN YOUR NEAREST
M A R I O N
DISTRIBUTOR**

The Marion Steam Shovel Company, 571 Howard Street, San Francisco 5, Calif.; Joseph O. Reed, The Marion Steam Shovel Company, 603 Terminal Sales Bldg., Portland 5, Ore.; Star Machinery Co., 1741 First Ave., South, Seattle 4, Wash.; Shaw Sales & Service Co., 5100 Anaheim Telegraph Road, Los Angeles, Calif.; H. H. Nielson, 541 West Second South Street, Salt Lake City, Utah.



There are still a few open spaces on the
M A R I O N
schedule for some sizes of Shovels ★
Draglines ★ Clamshells
Cranes ★ Pull-shovels
What size or type machine do You need?

THE M A R I O N STEAM SHOVEL CO., MARION OHIO
Offices and Warehouses in all Principal Cities ★ $\frac{3}{4}$ cu. yd. to 40 cu. yds.



Gar Wood Cable Dozecaster



Gar Wood 2-Wheel Hydraulic Scraper



**GAR WOOD
ROAD MACHINERY
WITH ALLIS-CHALMERS DIESEL POWER**

up GOES YARDAGE
down GO COSTS

Gar Wood earth moving units boost yardage to a maximum by superior maneuverability, ease of control and advanced design.

They push down costs by their high efficiency on the job and by staying on the job.

"Teamed-up" with Allis-Chalmers 2-cycle Diesel Tractors, they have the power to get jobs done most economically and quickly. Service is always promptly available.

These are some of the reasons for the increasing demand for Gar Wood Road Machinery, now the greatest by far in Gar Wood history—demand that has reached the proportions of a nationwide trend. Get the Gar Wood units that will push your yardage up and your costs down from your Allis-Chalmers dealer.



Down goes a 60-foot-high tree to the irresistible push of a Gar Wood Hydraulic Bulldozer



GW ROAD MACHINERY
is Sold Through
ALLIS-CHALMERS
Dealers Everywhere

ROAD MACHINERY DIVISION

GAR WOOD INDUSTRIES, Inc.
DETROIT 11, MICHIGAN

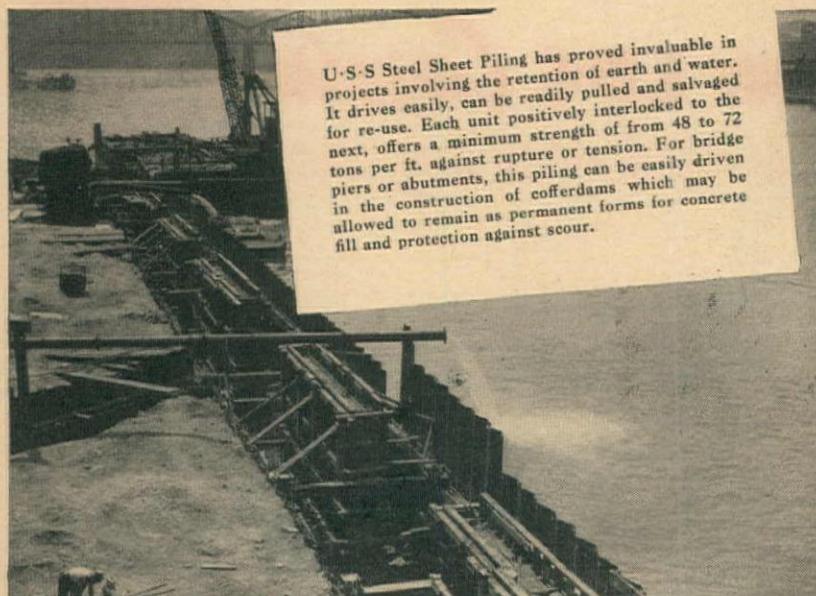
OTHER PRODUCTS OF GAR WOOD INDUSTRIES INCLUDE HOISTS AND BODIES • WINCHES AND CRANES • TANKS • HEATING EQUIPMENT • MOTOR BOATS

- To solve tough foundation problems
- To keep earth and water in place



This foundation at Sepulveda Dam, one of the largest pile driving jobs ever undertaken in Los Angeles County, Calif., is typical of the nationally important foundation jobs in which economical and practical considerations are best served by U-S-S Steel Bearing Piles. These Bearing Piles, weighing 53 lbs. per foot, were used in 45 and 60 ft. lengths. They consist of both vertical and batter piles, the latter being driven on batter of 18 degrees.

-choose Steel



U-S-S Steel Sheet Piling has proved invaluable in projects involving the retention of earth and water. It drives easily, can be readily pulled and salvaged for re-use. Each unit positively interlocked to the next, offers a minimum strength of from 48 to 72 tons per ft. against rupture or tension. For bridge piers or abutments, this piling can be easily driven in the construction of cofferdams which may be allowed to remain as permanent forms for concrete fill and protection against scour.

IN cut-off and core walls for dams and dikes, in wharves, slips, seawalls, in bridge pier retaining walls and in railroad and highway abutments, U-S-S Steel Sheet Piling offers easily installed construction that is strong, rugged and lasting. It forms a wall that is sand-tight and continuous and that can be made watertight. Made in straight-web, arch-web, and Z-sections, it is available in a complete range of sizes and sections.

In U-S-S Steel H-Beam Bearing Piles, engineers have found lasting safety and economy for every type of foundation job. On large jobs and small, in fresh and salt water, under buildings, bridges and viaducts, these strong, permanent, easily driven H-Beam Piles have proved their ability to provide a secure means of supporting foundations in unstable materials of great depth.

Their capacity for high unit loads, both vertical and horizontal, permits fewer piles and fewer driving operations for a given load.

We will be glad to send you catalog and authoritative data sheets on these products and other U-S-S Construction Steels. If your particular problem goes beyond the comprehensive limits covered in such literature, the services of our engineers are available.

EVERY SUNDAY EVENING, United States Steel presents *The Theatre Guild on the Air*. American Broadcasting Company coast-to-coast network. Consult your newspaper for time and station.

COLUMBIA STEEL COMPANY

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



Pacific Coast Distributors for
AMERICAN BRIDGE COMPANY · AMERICAN STEEL & WIRE COMPANY · NATIONAL TUBE COMPANY
CARNEGIE-ILLINOIS STEEL CORPORATION · TENNESSEE COAL, IRON & RAILROAD COMPANY
United States Steel Export Company, New York

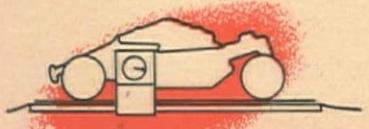
UNITED STATES STEEL

LOAD... haul ...DUMP... SPREAD

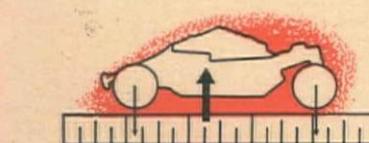


you're yards ahead with

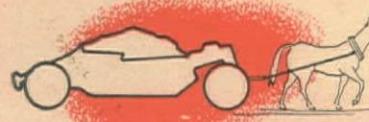
the new LPC Carrimor*



LOWEST WEIGHT
PER YARD OF CAPACITY



PROPER
WEIGHT DISTRIBUTION



LOW HORSEPOWER
REQUIREMENTS

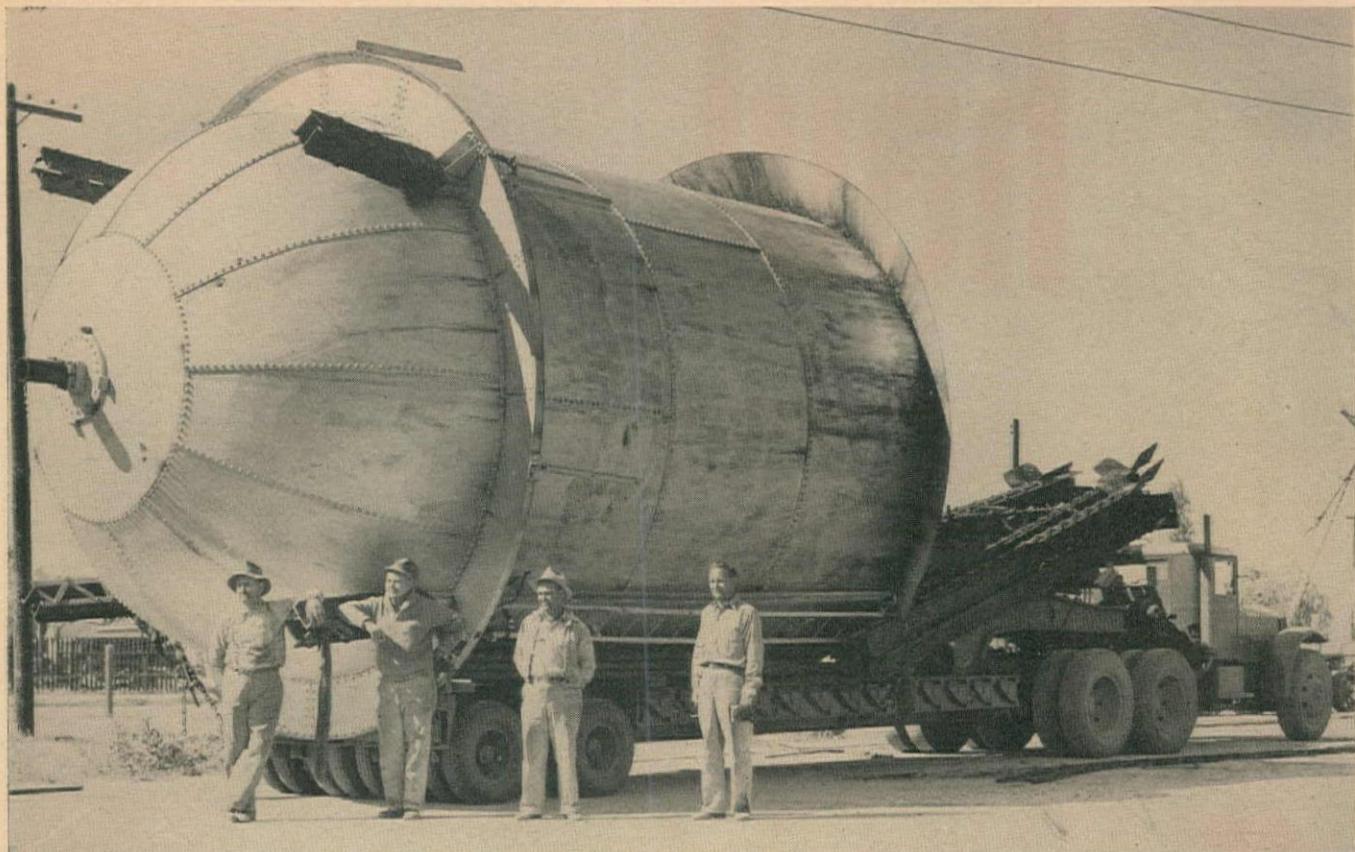
Once you get a load into a scraper, it's important to get it rolling to the dump—and back again—as quickly as possible. Here again, you'll earn more with a "Carrimor" because it has less dead weight per yard of capacity than any other scraper on the market. This, together with proper weight distribution, reduces horsepower requirements and fuel costs, saves wear and tear on your tractor and enables you to handle peak pay loads with maximum efficiency.

Low center of gravity, low draft and low overall height also mean that the new LPC "Carrimor" trails easier, has greater stability and can be operated anywhere without worrying about overhead clearance. Moreover, the choice of single, over-size single or dual tires assures efficient results under all working conditions. Get the facts and you'll get an LPC—for lowest possible cost per yard. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; Oakland, Calif.

*Trade Mark Registered

LaPLANT-CHOATE
Engineered Earthmoving

**Lowest Possible Cost
per yard**



TRAILMOBILE TAKES TANK TO MEXICO

Here is a huge 60,000 pound water tank, owned by the Arizona Edison Company, which for years furnished water for Casa Grande, Arizona. It was lowered 65 feet from the top of its supporting tower and loaded onto the TRAILMOBILE shown above.

Then started the trek to Agua Prieta, Sonora, Mexico, just across the International Line from Douglas. The rigging and hauling job was assigned to Lee Garrison and William Hansen, Arizona contractors and contract haulers, who rely on a TRAILMOBILE low bed for transporting their heaviest loads.

For hauling powerhouse and refinery equipment, as well as oil field machinery, and contractors' equipment, you just can't beat the easy pulling TRAILMOBILES. That's why so many contractors and riggers use them.

THE TRAILMOBILE COMPANY • BERKELEY, CALIFORNIA

TRAILMOBILE

Los Angeles Berkeley

Sacramento

Fresno

San Jose

Bakersfield

Stockton

Ogden

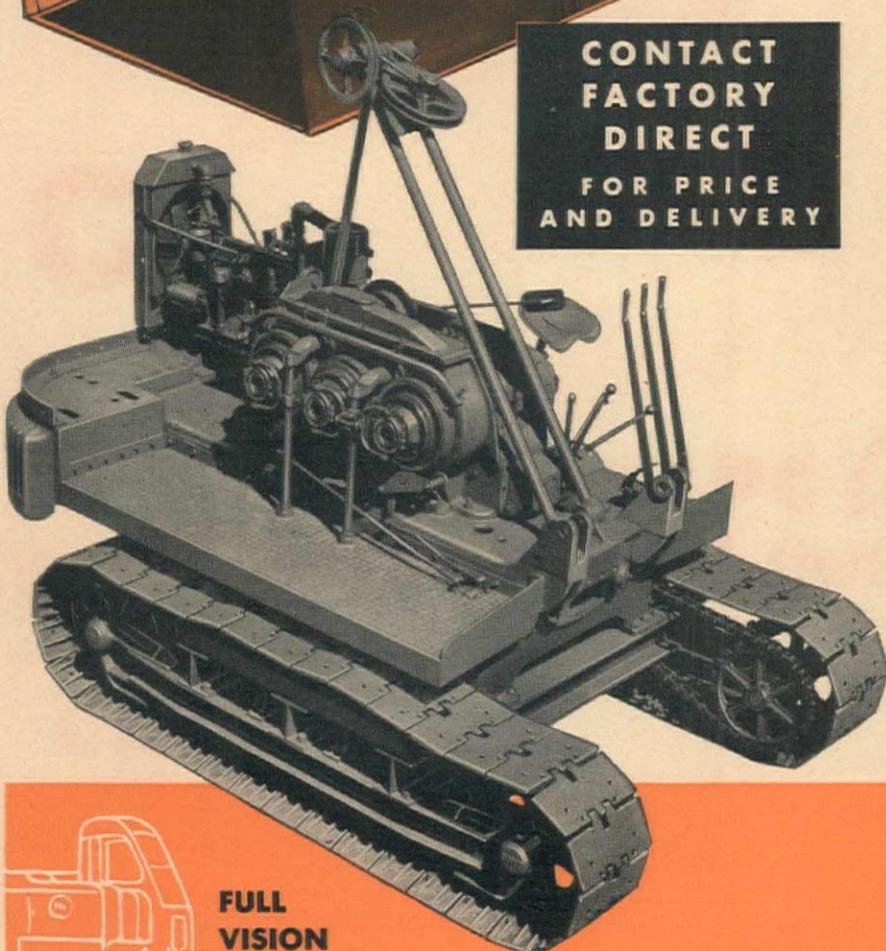
Seattle

Honolulu

LOOK into UNIT!



CONTACT
FACTORY
DIRECT
FOR PRICE
AND DELIVERY



FULL VISION CAB

Operator can see in ALL directions. No "blind spots". Promotes safety. Increases job efficiency.

½ AND ¾ YD. EXCAVATORS

UNIT CRANE & SHOVEL CORP.



5 TO 10 TON CRANES

MILWAUKEE 14,
WISCONSIN, U.S.A.

Lift the cab from any UNIT crane or shovel. You'll find the following exclusive features not found in any other comparable machine:

- Compact, modern design . . . all parts readily accessible.
- Gasoline engine mounted in straight line with main machinery.
- Drop-forged alloy steel gears and splined shafts, heat-treated.
- Automatic traction brakes . . . no manual control required.
- Disc type clutches, interchangeable with easy and foolproof adjustment.
- One-piece cast gear case...simple in design and built as carefully as the finest automotive transmission . . . dust-proof and oil tight.

And that isn't all! A UNIT costs less . . . is more economical to operate . . . is built to endure. Investigate today.

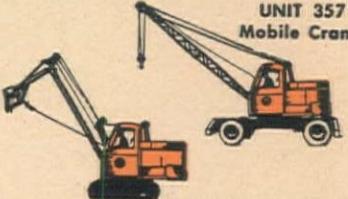
Convertible TO ALL ATTACHMENTS

Shovel . . . Clamshell . . .
Dragline . . . Trenchoe . . .
Magnet . . . Pile Driver . . .
Back Filler.

UNIT 1020
Clamshell



UNIT 357
Mobile Crane



UNIT 514
Trenchoe



UNIT 514
Shovel

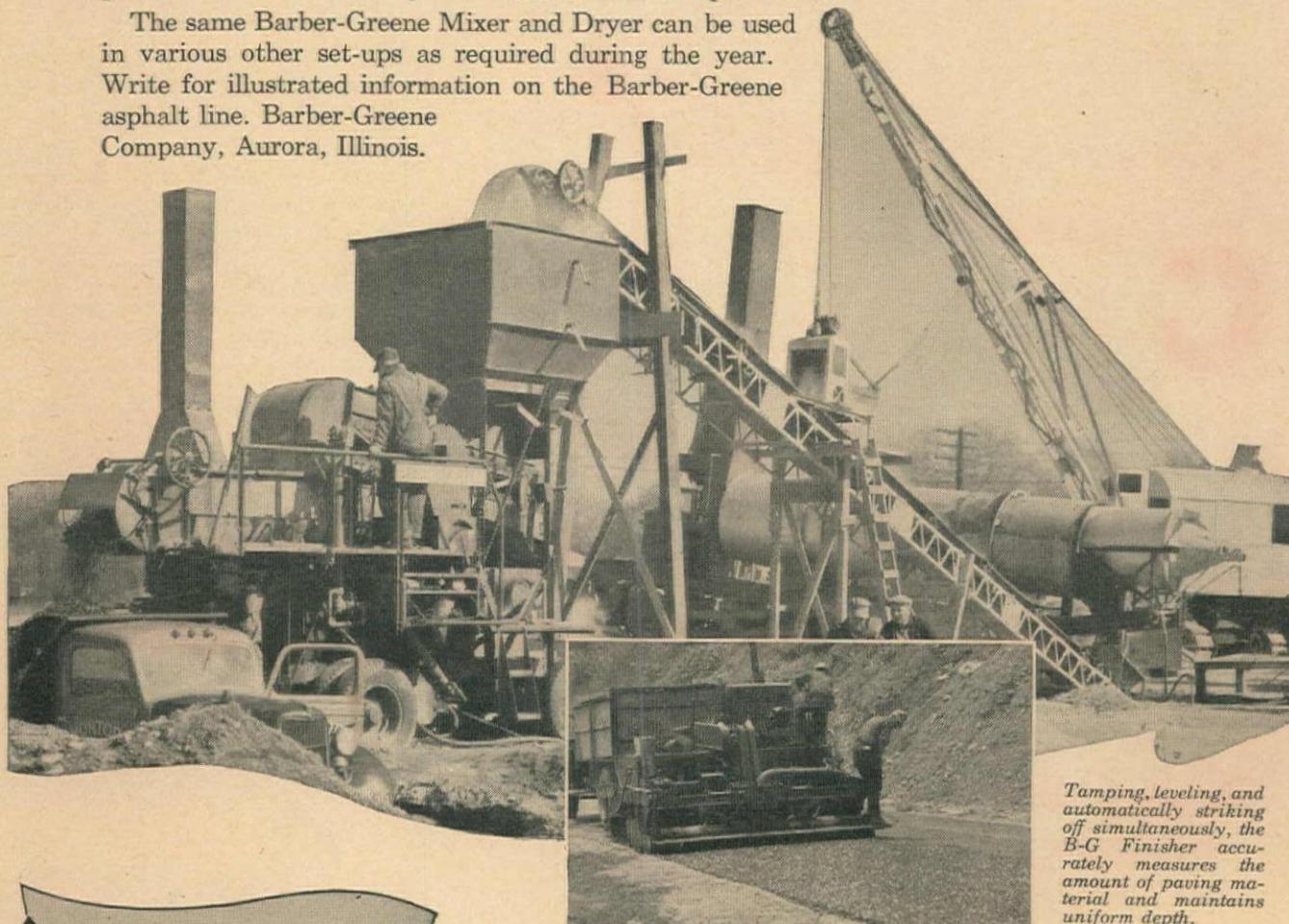


How a Asphalt Plant Provides "Intermediate" Mixing

- For "intermediate" roads—roads having traffic too heavy for a travel plant mat, but not sufficient to warrant the high type, densely graded Class I mixes—the Barber-Greene Mixer and Dryer may be combined to provide a plant quality mix at 10 to 120 tons per hour, depending on size of units.

Moisture content—responsible for the failure of many secondary pavements—is positively controlled by the B-G Intermediate Plant. In addition, use of heavier bitumens is permitted, producing a higher quality surface than can be obtained with road mix. And frequently at comparable cost. Temperature control gives this B-G plant a wide range of application, from road mix types to high quality asphaltic concretes. High capacity and low erection costs make high quality pavements possible on roads formerly restricted to mixed-in-place surfaces.

The same Barber-Greene Mixer and Dryer can be used in various other set-ups as required during the year. Write for illustrated information on the Barber-Greene asphalt line. Barber-Greene Company, Aurora, Illinois.



Tamping, leveling, and automatically striking off simultaneously, the B-G Finisher accurately measures the amount of paving material and maintains uniform depth.

46-10

 **Barber-Greene**

CONSTANT FLOW EQUIPMENT



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

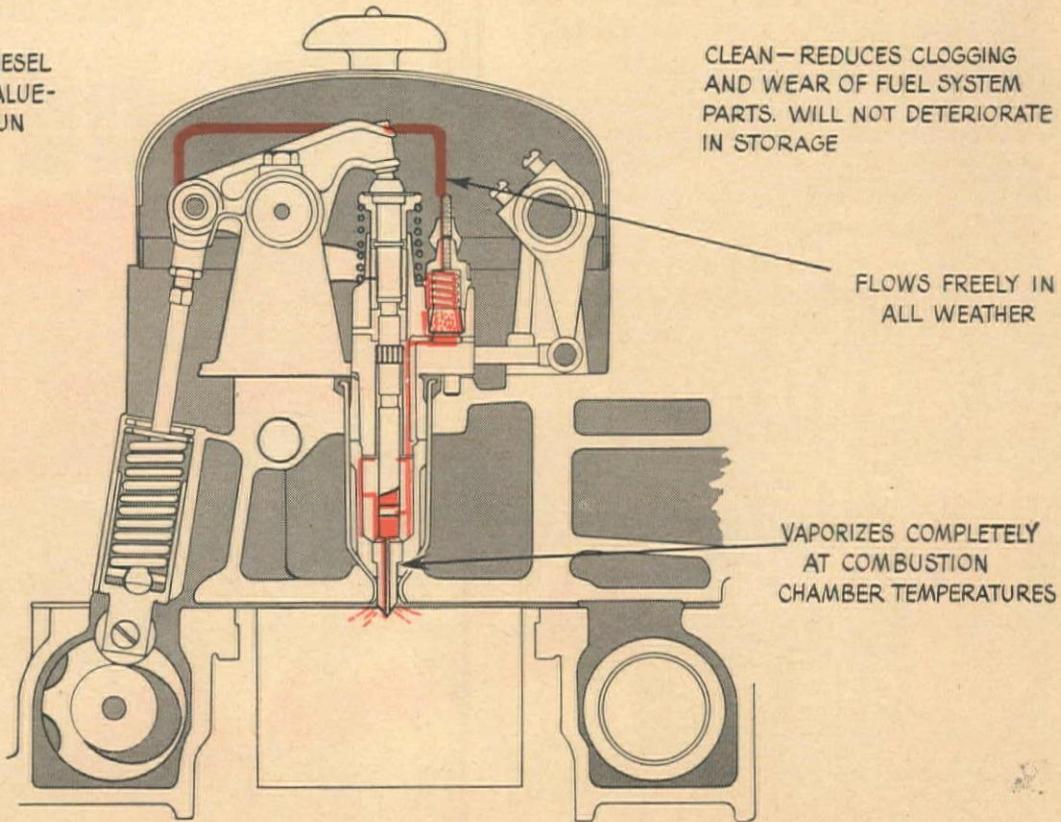
Brown-Bevis Equipment Co., Los Angeles 11, Calif.; Brown-Bevis Equipment Co., Phoenix, Ariz.; Columbia Equipment Co., Spokane, Wash.; Columbia Equipment Co., Seattle, Wash.; Columbia Equipment Co., Boise, Idaho; Contractors Equip. & Supply Co., Albuquerque, New Mexico; Ray Corson Machinery Co., Denver 2, Colo.; Jensen Machinery Co., San Francisco 7, Calif.; Lund Machinery Co., Salt Lake City, Utah; Western Construction Equipment Co., Billings, Mont.; Western Construction Equipment Co., Missoula, Mont.

STANDARD ENGINEERS NOTEBOOK



STANDARD AUTOMOTIVE DIESEL FUEL HAS HIGH CETANE VALUE—ENGINES START EASILY, RUN SMOOTHLY

NON-SMOKING AND NON-IRRITATING EXHAUST



Special Diesel Fuel ends hard-starting and knocking

Where Diesel engines require fuel of high-cetane value and volatility, Standard Automotive Diesel Fuel will help them perform with maximum efficiency.

Standard Automotive Diesel Fuel is a completely distilled, quality fuel. Its range of distillation is carefully controlled during refining so that it vaporizes completely at combustion chamber temperatures, and yet, provides maximum power. It has a high-cetane value—a minimum of 50. This means easy starting, even in cold weather, and smooth running and idling without ignition knock.

These outstanding qualities assure complete combustion of Standard Automotive Diesel Fuel with a

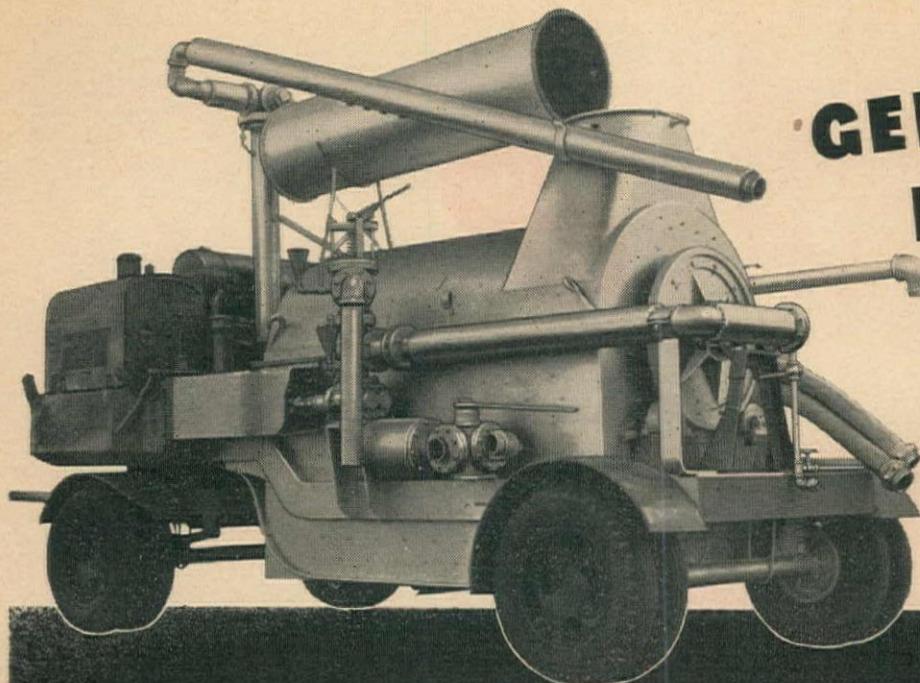
minimum of smoke and obnoxious exhaust odors.

The pour point of Standard Automotive Diesel Fuel is extremely low. This provides fluidity in all atmospheric temperatures normally encountered in operation and insures good circulation of fuel in cold weather. Because of its high stability, this special fuel may be stored for long periods without losing its unusual operating characteristics.

For Diesel engines which are not as sensitive to cetane value or volatility of the fuel but do require higher viscosity for lubrication of fuel pumps and injectors, we recommend our regular grade of Standard Diesel Fuel.

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert service—make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

FOR EVERY JOB A **STANDARD OF CALIFORNIA** TEST-PROVED PRODUCT

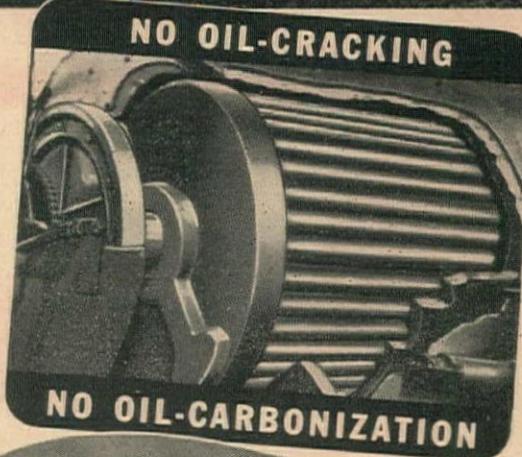


GERLINGER PORTABLE Rotary Oil RETORT

Controlled Rotary Heat Process
an All Exclusive Feature insures
1000 GALLONS OF ROAD OIL
OR ASPHALT
LOADED OUT **IN 4 MINUTES**

In a single hour the temperature of 10,000 gallons of road oil or asphalt can be raised 60 degrees by the Gerlinger Rotary Oil Retort through an exclusive Gerlinger feature—the rotary coil! This complete, safe and highly time-saving feat is possible because the Gerlinger Rotary Coil contains 550 square feet of rapid and controlled heating surface. It is also insured against formation of carbon or oil cracking. Oil or asphalt heated by this exclusive Gerlinger process is now ready to be loaded out at the unbelievable rate of 1,000 gallons every four minutes. Each unit of this unique retort has been carefully, painstakingly engineered and deserves the praise given it by highway builders all over the country.

For detailed information and specifications please phone or write Department 7, Salem Iron Works, Salem, Oregon.



GERLINGER
PRODUCTS

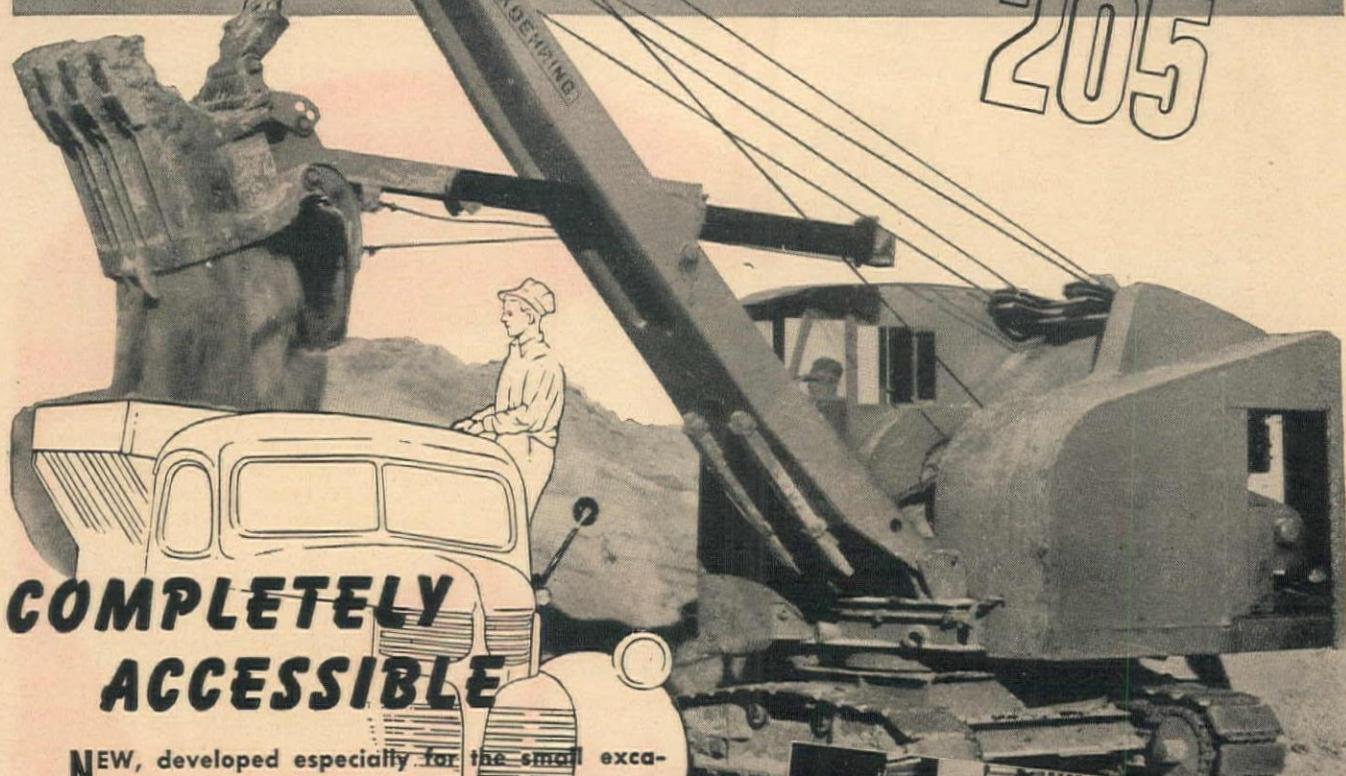
A
PRODUCT
OF

SALEM IRON WORKS

SALEM
OREGON

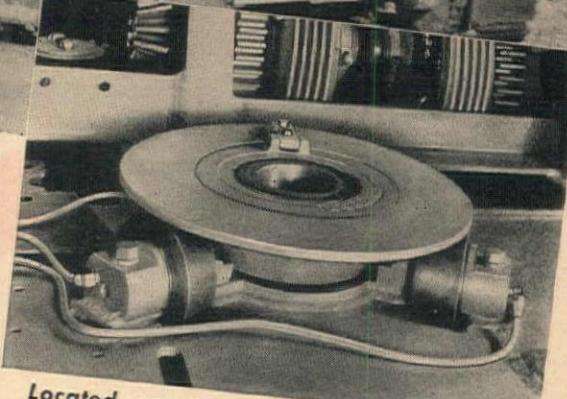
HOOK ROLLERS *On Top* OF THE TURNTABLE

KOEHRING
205



NEW, developed especially for the small excavator, the load equalizing hook rollers of the Koehring 205 deliver every operating advantage of conventional hook roller design — free swings at peak loads, easy "coasting" on every swing. But, unlike conventional design, the rollers of the Koehring 205 are on top of the turntable, up where the operator can observe them from the cab, completely and easily accessible.

Because the hook roller track automatically adjusts, each of the three hook rollers takes only 1/3 of the load at any time; the full load never rides on only one. Rollers are lubricated from inside the operator's cab.



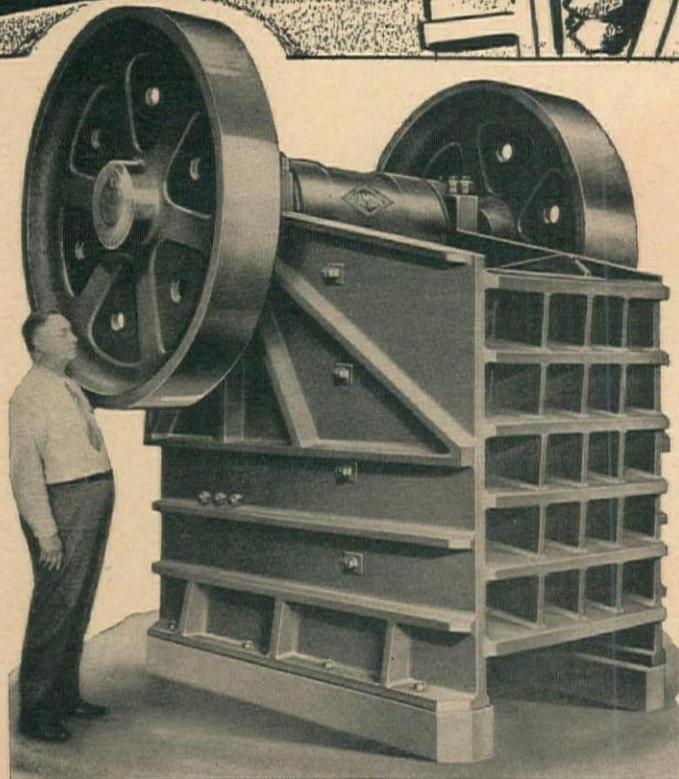
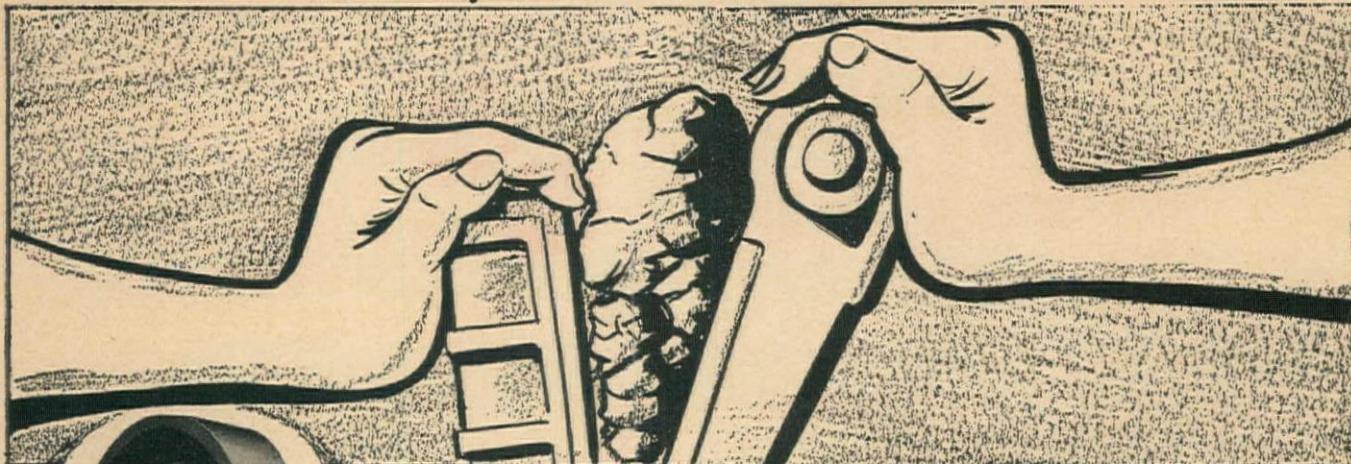
KOEHRING COMPANY
MILWAUKEE 10, WISCONSIN

PACIFIC HOIST & DERRICK CO. Seattle, Washington
WESTERN MACHINERY CO. Spokane, Washington
COLUMBIA EQUIPMENT CO. Portland, Oregon
MOORE EQUIPMENT CO. Stockton, California
HARRON, RICKARD & McCONE CO., San Francisco-Los Angeles

KOEHRING COMPANY WEST COAST PARTS WAREHOUSE . Sacramento, California

MCKELVY MACHINERY CO. Denver, Colorado
HARRY CORNELIUS CO. Albuquerque, New Mexico
NEIL B. McGINNIS CO. Phoenix, Arizona
LUND MACHINERY CO. Salt Lake City, Utah
WESTERN CONSTRUCTION EQUIPMENT CO. . Billings, Mont.

THE DIAMOND "Long Jaw" has GIANT CRUSHING POWER



**Get Maximum Output
with the
DIAMOND
JAW CRUSHER**

The output of your primary crusher controls the output of the entire plant. A DIAMOND crusher on the job keeps screens, conveyors and elevators running at capacity, and keeps bins loaded. It will handle even the hardest rock and operates with a minimum of undersize and excellent uniformity of product.

The "Long Jaw" design of the DIAMOND means that the primary crushing effect at the top area of the jaw is a direct, smashing impact from the overthrow of the heavy eccentric shaft. The revolution continues downward, and a combined crushing and grinding action throughout the entire jaw area takes place. A receding action follows and discharges the product on the underthrow of the eccentric.

MADE IN 10 SIZES

Write for Bulletin D-43-D which tells all about the ten DIAMOND sizes for every primary crushing need.

OTHER DIAMOND PRODUCTS

Jaw Crushers . . . Roll Crushers . . . Hammermills . . .
Screens . . . Conveyors . . . Bins . . . Feeders . . .
Portable and Stationary Plants.

**"THERE'S NOTHING TOUGHER
THAN A DIAMOND"**

DIAMOND DEALERS

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



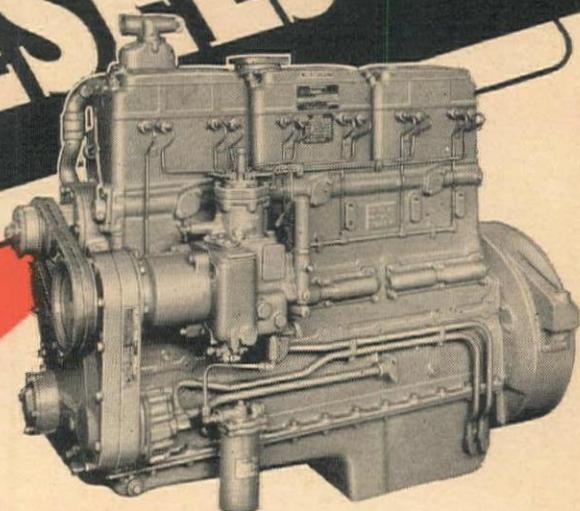
**DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIVISION**

1818 SECOND STREET NORTH

MINNEAPOLIS 11, MINNESOTA

**Proved dependable...through millions
of work-hours...handling and moving
millions of tons. On these tough jobs
you can't beat the proved performance
of Cummins Dependable Diesels!***

CUMMINS
Dependable
DIESELS



***The Facts:** No fewer than 54 of the nation's first-ranking builders of material handling and earth moving equipment today offer Cummins as standard or optional original power! What

better proof of proved performance? For every heavy-duty job in the construction and aggregates industry, there is a proved-on-that-job Cummins Diesel—150-200-275 hp (maximum).

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA



Just connect the bulldozer conversion unit illustrated here to a Huber Maintainer . . . it's as simple as that . . . and you have a bulldozer which will move plenty of dirt for you . . . and move it fast! Huber's bulldozer unit has a 6' blade, 20" deep, which can be raised and lowered hydraulically from 20" above to 1" below ground level. There's plenty of push behind it, too—thanks to the Maintainer's sturdy, dependable 32 horse engine. Why not ask your nearest Huber distributor for a bulldozer demonstration . . . today?

THE **Huber** MFG. COMPANY • MARION, OHIO, U. S. A.

LEE & THATRO EQUIPMENT CO.
Los Angeles, Calif.

THE O. S. STAPLEY CO.
Phoenix, Arizona

EDWARD F. HALE CO.
Hayward, Calif. • San Francisco, Calif.

THE MINE & SMELTER SUPPLY CO.
Denver, Colorado

CONTRACTORS' EQUIPMENT & SUPPLY CO.
Albuquerque, New Mexico

FEENAUGHTY MACHINERY CO.
Portland, Ore. • Boise, Idaho
Seattle, Wash. • Spokane, Wash.

THE C. H. JONES EQUIPMENT CO.
Salt Lake City, Utah

Contractors say

ROCK DRILLING
COSTS ARE LESS WITH
Timken Bits



Any contractor who has had any appreciable experience with Timken Rock Bits will tell you that his rock moving costs are considerably lower than they used to be.

That's because Timken Bits drill faster; yield more footage per bit; can usually be reconditioned several times for additional service life; drastically cut steel costs; save the drillers' time.

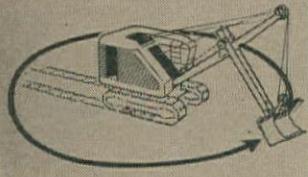
These advantages spring from a combination of design, material and manufacturing technique that cannot be duplicated. No other bit manufacturer makes his own steel. No other bit manufacturer has the benefit of such far-reaching metallurgical knowledge and experience.

If you've never used Timken Bits you don't know what you're losing. Write for name of nearest authorized distributor. The Timken Roller Bearing Company, Canton 6, Ohio.

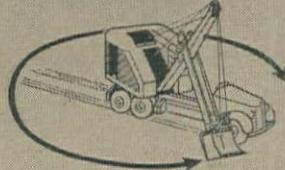
TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
ROCK BITS

BEFORE

You could have a full circle shovel on CRAWLERS...



or, a part circle shovel with rubber tire MOBILITY...



NOW

You can have a full circle shovel with rubber tire mobility... and one man operation



Profit WITH THESE OUTSTANDING FEATURES:

1 SELF PROPELLED... around the job or on the highway.
Eliminates Trailer

2 ONE MAN OPERATED... All controls conveniently grouped for operating or steering by the one operator.
Eliminates Second Man

3 4-WHEEL DRIVE... 6 wheel traction, mud grip tires.
Specially Engineered Chassis

4 DIGS ALL AROUND... Over front, sides, back.
A Full Circle Machine

5 AIR CONTROLS, AIR BRAKES... Power steer.
Not An "Old" Design Modernized

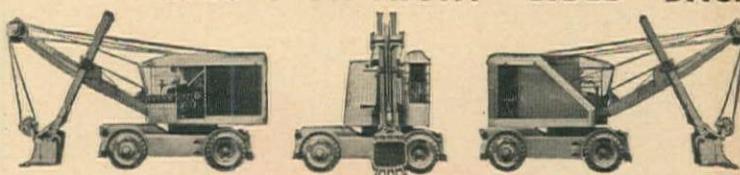
6 NEW SMOOTH, "AIRFLEX" COOL INTERNAL EXPANDING CLUTCHES.
Free From Adjustment and Repair

7 ENCLOSED GEARS RUNNING IN FLOWING OIL.
Efficient, Clean, Longlived

8 CONVERTIBLE TO ALL ATTACHMENTS.
7½ Ton Safe Crane Lifting Capacity



DIGS OVER FRONT • SIDES • BACK



This complete illustrated booklet will show you how Byers Traveler meets today's power shovel requirements

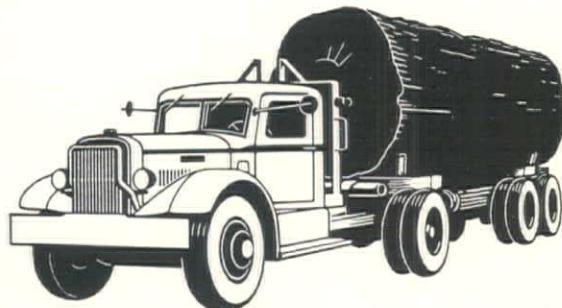
THE BYERS MACHINE COMPANY • RAVENNA, OHIO
Distributors throughout the world



Byers shovels are distributed through:

EDWARD R. BACON COMPANY, San Francisco
NELSON EQUIPMENT CO., Portland & Seattle Offices
RAY CORSON MACHINERY CO., Denver
WILLARD EQUIPMENT, LTD., Vancouver, B. C.
EQUIPMENT SALES CO., Phoenix, Arizona

BYERS HALF YARD TRAVELER



BIG TRUCKS FOR BIG LOADS

Big trucks, built to carry big loads, are needed now to feed the fires of industry with the raw materials for civilian production. Let those trucks be Autocars, for Autocar Trucks are specifically engineered and precision-built for *heavy*, heavy-duty work. Autocars cost more *because they're worth more*. They're worth more because they haul more tons, more miles, at less cost. They have the extra stamina, brawn, and power to command the load at all times.

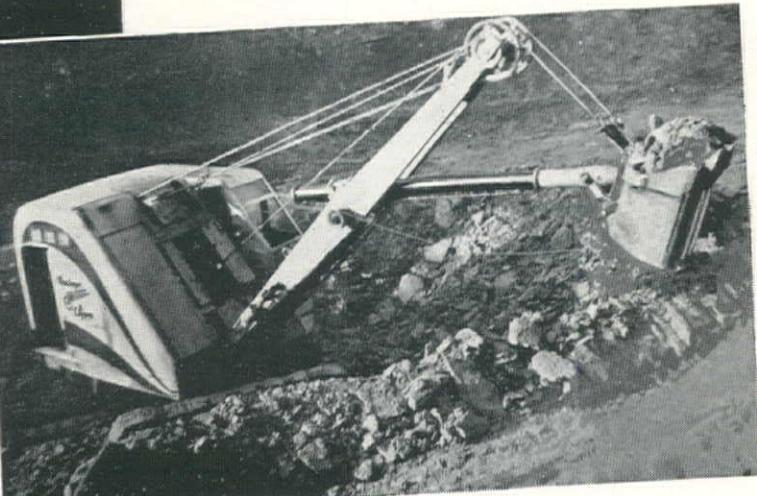
AUTOCAR TRUCKS FOR HEAVY DUTY

SOLD AND SERVICED BY POINTER-WILLAMETTE CO.
IN OREGON, WASHINGTON, AND MONTANA

HEADQUARTERS: 238 N. E. OREGON ST., PORTLAND 14

TOUGH - for its size!

BUCKEYE CLIPPER



Let cost-cutting Buckeye Clippers solve your material handling problems. Operators like the smooth, easy way they handle. Owners like the lower operating costs!



BUCKEYE TRENCHERS FILL EVERY NEED!

The Buckeye "160" Trencher, shown above, digs trench from 16" to 42" wide and up to 12'6" deep. Its shiftable boom, maneuverability, and light yet rugged construction make it ideal for contractors on both city and country work. THERE'S A COST-CUTTING BUCKEYE TRENCHER FOR EVERY TRENCHING NEED!

1/2 AND 3/4 YARD POWER SHOVELS

From the shoes on the crawlers to the sheaves on the boom, Buckeye Clipper $\frac{1}{2}$ and $\frac{3}{4}$ yard shovels are designed and built to take the toughest kind of work day-in and day-out. Production is greater because of in-built speed and ease of handling. Long life with low maintenance costs is assured by the use of top quality, tested and proved materials in every part.

Buckeye Clippers exclusively have "Mevac" metered vacuum power control—similar to that used for years on big highway trucks—which gives instant, measured response and improved

operator "feel." Eliminates operator fatigue.

In all, Buckeye Clippers feature 24 points of superior design and construction that mean more production at lower overall cost. They can quickly and easily be converted for any standard front end attachments; have automatic swing brake; 360° swing; swing, crowd and hoist while traveling; non-clogging, self cleaning crawlers; independent chain crowd, etc.

Send for your copy of "Age of the Clippers" and learn how Buckeye Clippers will help you increase production and lower costs.

BUCKEYE TRACTION DITCHER COMPANY

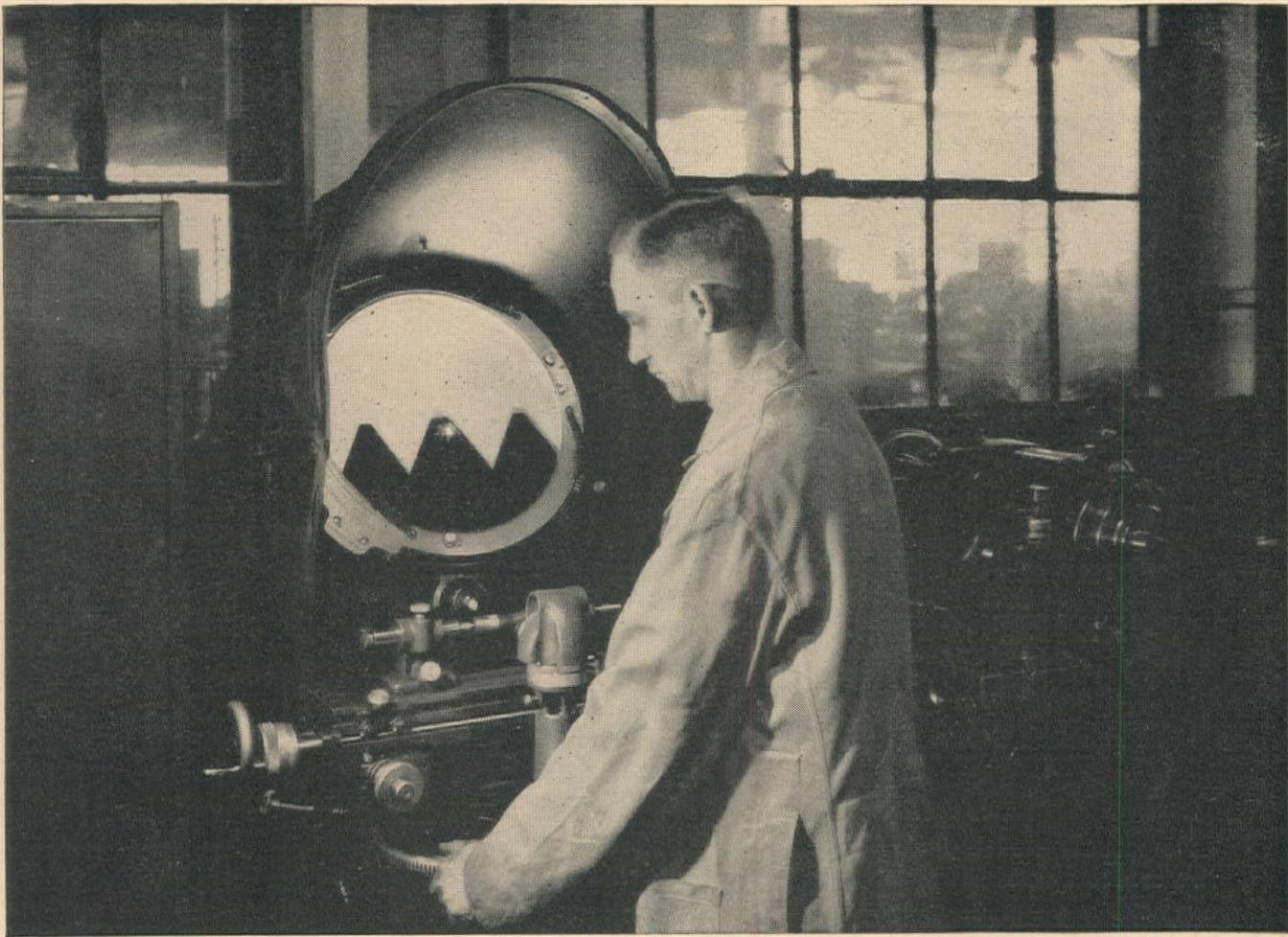
FINDLAY, OHIO

®



Buckeye

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



An optical comparator used to check gear thread profiles in the OLIVER "Cletrac" plant.

Check... and double check



It's fundamental at Oliver "Cletrac" . . . the checking and double checking of all tractor parts before they are assembled. The most modern of testing and checking devices are in daily use as typified by this operator checking the thread profile of a gear.

The thread, magnified 62½ times, is projected on the screen where minor and major diameters, including angle and lead, can be checked within .0001. Use of precision equipment such as this guarantees that nothing is left to chance in building Oliver "Cletracs."

Quality is the standard that characterizes every tractor part . . . in design, workmanship, materials and performance.

Maintenance of that standard enables your Oliver "Cletrac" dealer to offer you the finest in crawler tractors . . . for your every need.

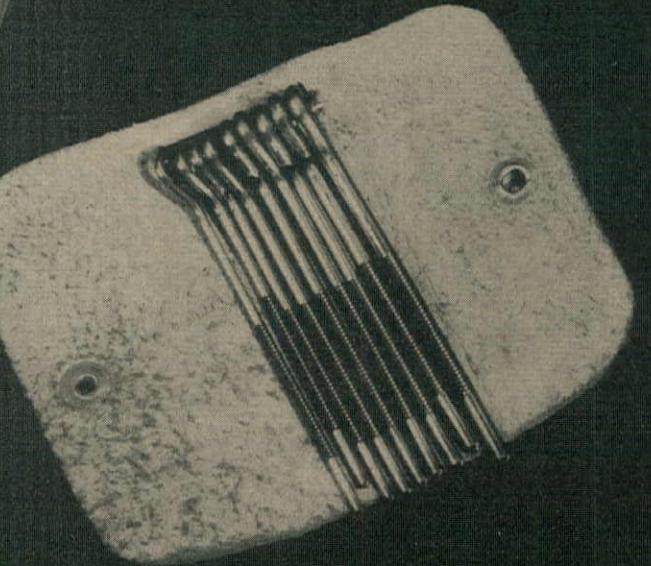
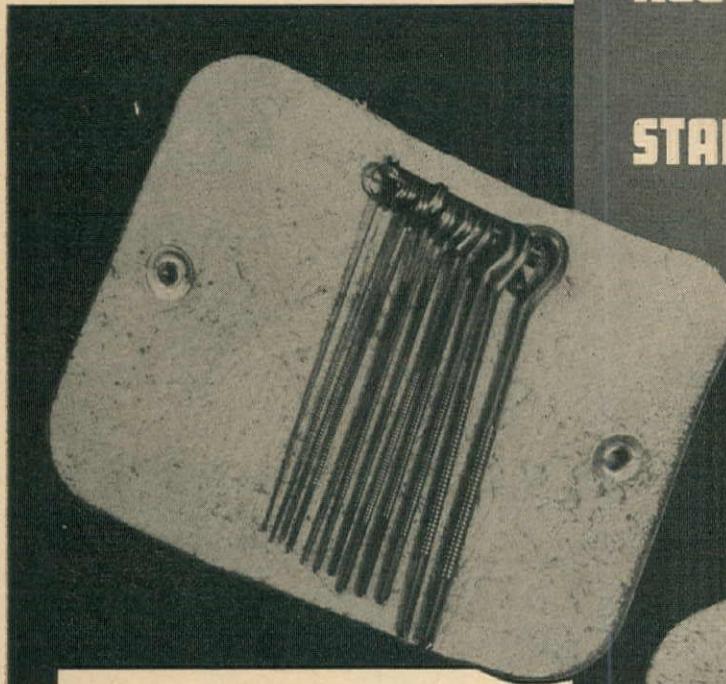
CLETRAC

a product of



The OLIVER Corporation

State of Arizona: Choguill Tractor Co., Phoenix. State of California: Gustafson Tractor Co., Eureka; Mechanical Farm Equipment Dist., Inc., San Jose; Comber & Mindach, Modesto; Nelson Equipment Co., Los Angeles; Tractor & Equipment Co., San Leandro; Flood Equipment Co., Sacramento; W. J. Yandie, Santa Rosa; Hamsher Tractor Co., Stockton. State of Washington: Burrows Motor Company, Yakima; Inland Truck & Diesel Company, Spokane; Pacific Hoist & Derrick Co., Seattle; Melcher-Ray Machinery Co., 202 East Alder Street, Walla Walla; Coleman-Jones Equipment Co., Chehalis. State of Oregon: Loggers & Contractors Machinery Co., Portland and Eugene. State of Idaho: Idaho Cletrac Sales Co., Lewiston; The Sawtooth Company, Boise. Western Montana: Western Construction Equipment Company, Billings and Missoula. British Columbia: The A. R. Williams Machinery Company of Vancouver, Limited, Vancouver.



Keep welding and cutting tips clean with **STAINLESS STEEL WYPO TIP CLEANERS**

Wypo Tip Cleaner Set No. 1

contains 12 tip cleaners covering drill sizes 75 to 49. For VICTOR (or equivalent) welding tip sizes 000 to 4; VICTOR (or equivalent) cutting tip preheating ports tip sizes 000 to 10 and oxygen jets of tip sizes from 000 to 3. Per set, in leather holder \$2.40

Wypo Tip Cleaner Set No. 2 ➤

contains 9 tip cleaners covering drill sizes 48 to 30. For VICTOR (or equivalent) welding tip sizes 5 to 7 and VICTOR (or equivalent) cutting tip oxygen jets of tip sizes 4 to 7. Per set, in leather holder \$1.80

of WYPO tip cleaners . . . and here are but a few of the reasons why WYPO tip cleaners are better: 

1. They don't enlarge or taper original drill size of tip port.
2. They can't score or scratch the inner wall surfaces of tip ports.
3. They are easily applied thus inviting operators to keep tips in good working order.
4. They save man hours as well as gases because a clean tip performs economically and swiftly.

**Order your
WYPO Tip Cleaner Set TODAY**

VICTOR

VICTOR EQUIPMENT COMPANY,
844 Folsom Street,
San Francisco 7, California.

Gentlemen:

Please ship me today the following WYPO tip cleaner sets:

Quantity to Wypo Tip Cleaner Price per

be shipped Set Number Set Total

1	\$2.40	\$
2	\$1.80	\$

California State Tax of 21675, if this is not to California, add to

Blanchard, H. C. "M. — S. — T. — 6.2%G." 15th November 1901 California, and the

Please add California Sales Tax of 2 1/2% if shipped to California address
Charge my (our) account Mail COD Check enclosed

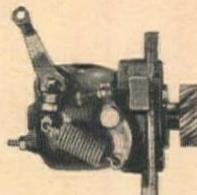
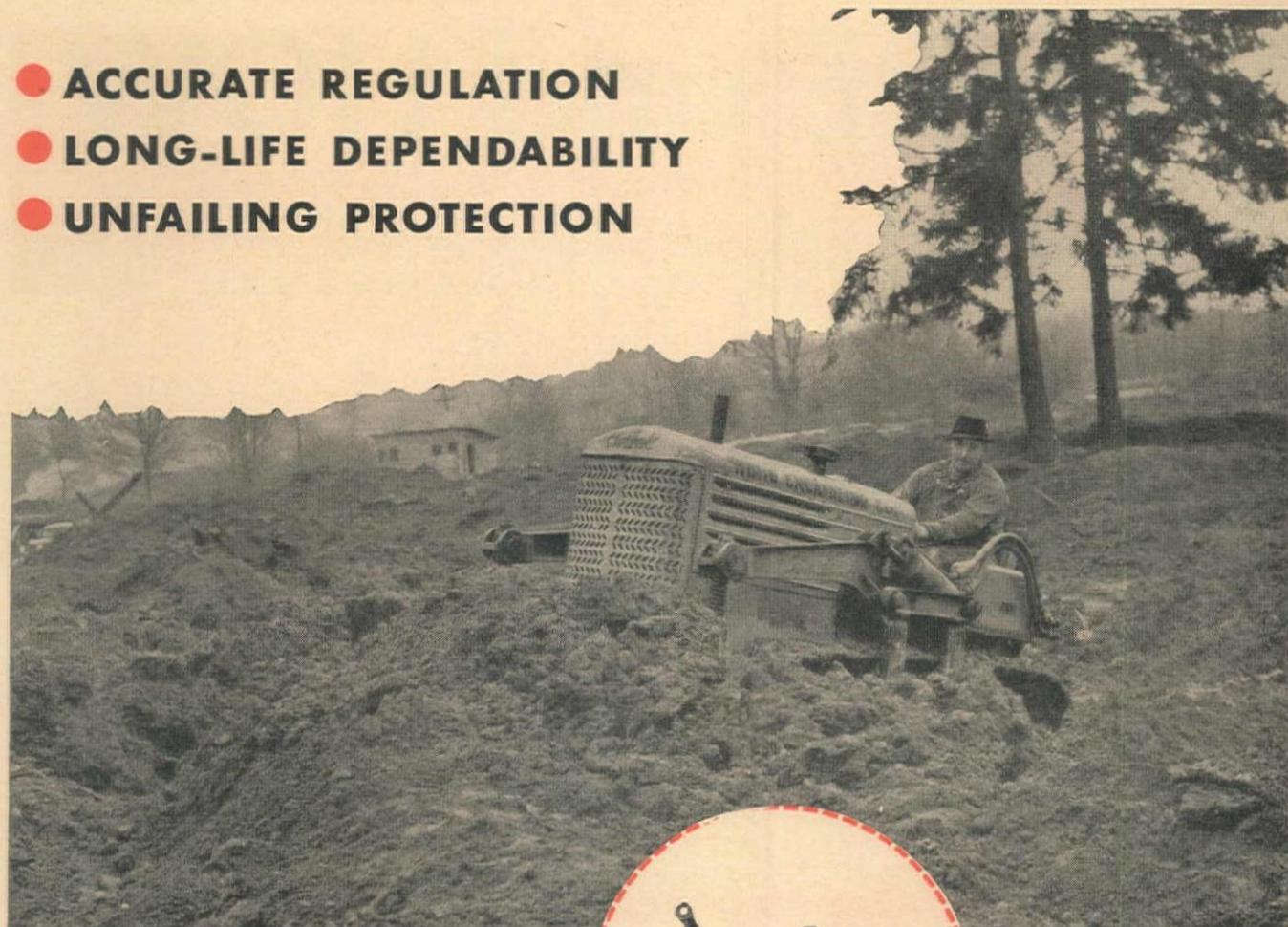
Name of Company

Name of Company

Volume 10, No. 1

WESTERN CONSTRUCTION NEWS—March 1946

- **ACCURATE REGULATION**
- **LONG-LIFE DEPENDABILITY**
- **UNFAILING PROTECTION**



PIERCE
GOVERNORS

● No matter what the engine is supplying power for—a bulldozer, a power-shovel, a grader, a roller or a truck—it can be no better controlled and protected than by a Pierce Precision Flyball Governor. And no matter what field you survey, you'll find Pierce setting the pace—and holding it. Pierce Governors are unsurpassed for accurate regulation, long-life dependability and unfailing protection.

That's why they are original equipment on many of the world's finest industrial engines—

gas, gasoline and diesel. And it's also the reason so many thousands of industrial engines are equipped with Pierce Governors as replacement control units. Specify Pierce-governing for the new engines you buy—for assurance of top performance and long, trouble-free service. If your present equipment is not Pierce-governed, write for full information.

THE PIERCE GOVERNOR COMPANY, INC.
1645 OHIO AVENUE • ANDERSON, INDIANA
Manufacturers of
Pierce Precision Governors and Sisson Automatic Chokes

WHERE and HOW

in installation, operation and



JOHNS-MANVILLE
JM
PRODUCTS

to REDUCE COSTS maintenance of water lines

FROM its low initial installation cost to its far-reaching economies over the years . . . in both water transmission and distribution lines . . . TRANSITE PRESSURE PIPE can save you money.

Made of asbestos and cement, this modern pipe can't tuberculate . . . is highly resistant to soil corrosion. Easily handled and installed,

it maintains high delivery capacity . . . forms tight yet flexible joints. It is used by thousands of communities all over the country because it provides more efficient, more economical water transportation year after year.

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



TRUCKING COSTS hit bottom with Transite! Its light weight means more footage carried per truckload—time and money saved in transporting this pipe to the job.



HANDLING COSTS too, are low. Fewer man-hours are required for unloading and lowering into the trench. Only the larger sizes require mechanical handling equipment.



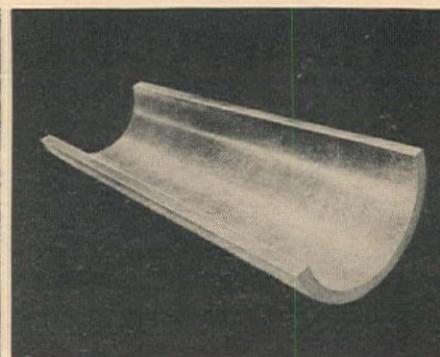
EXCAVATING COSTS, as shown above, are low with Transite. Trenches are narrow and disturbance to pavement is kept to a minimum. No bell holes are required at the joints.



ASSEMBLY COSTS drop with Transite. The Simplex Coupling permits quick, easy assembly . . . assures joints that stay tight, even when the line is deflected as much as 5° at each coupling.



MAINTENANCE COSTS are cut with Transite. Its tight joints, high uniform strength, proven durability and corrosion-resistance all contribute to its economical performance.



OPERATING COSTS stay low because this asbestos-cement pipe cannot tuberculate. As a result, its delivery capacity (C-140) remains high; pumping costs are minimized.

Johns-Manville TRANSITE PIPE

Fornaciari Company

ANNOUNCES NEW and EXPANDED SERVICE FACILITIES

for the
CONTRACTOR and ROADBUILDER



Pictured above are the new and larger headquarters and shop of the Fornaciari Company, Los Angeles equipment dealers and distributors for construction and building equipment.

FORNACIARI COMPANY, founded in 1929 by Bert Fornaciari, has continually strived to render better and more complete service to their customers. Recognizing the increased demand for construction equipment in the years ahead, Fornaciari Company, in tune with the times, are now able to offer their customers the most complete parts and equipment facilities for the companies they represent in the West.

A recent addition to their operation is a complete jack servicing shop, backed up by the largest stock of BUDA hydraulic and mechanical jacks on the West Coast, and parts for all popular makes of jacks. Listed below are the nationally-known companies and their products currently represented by the Fornaciari Company. If it's equipment, parts or service that you need for these items, write or wire Fornaciari Company.

Distributors for:

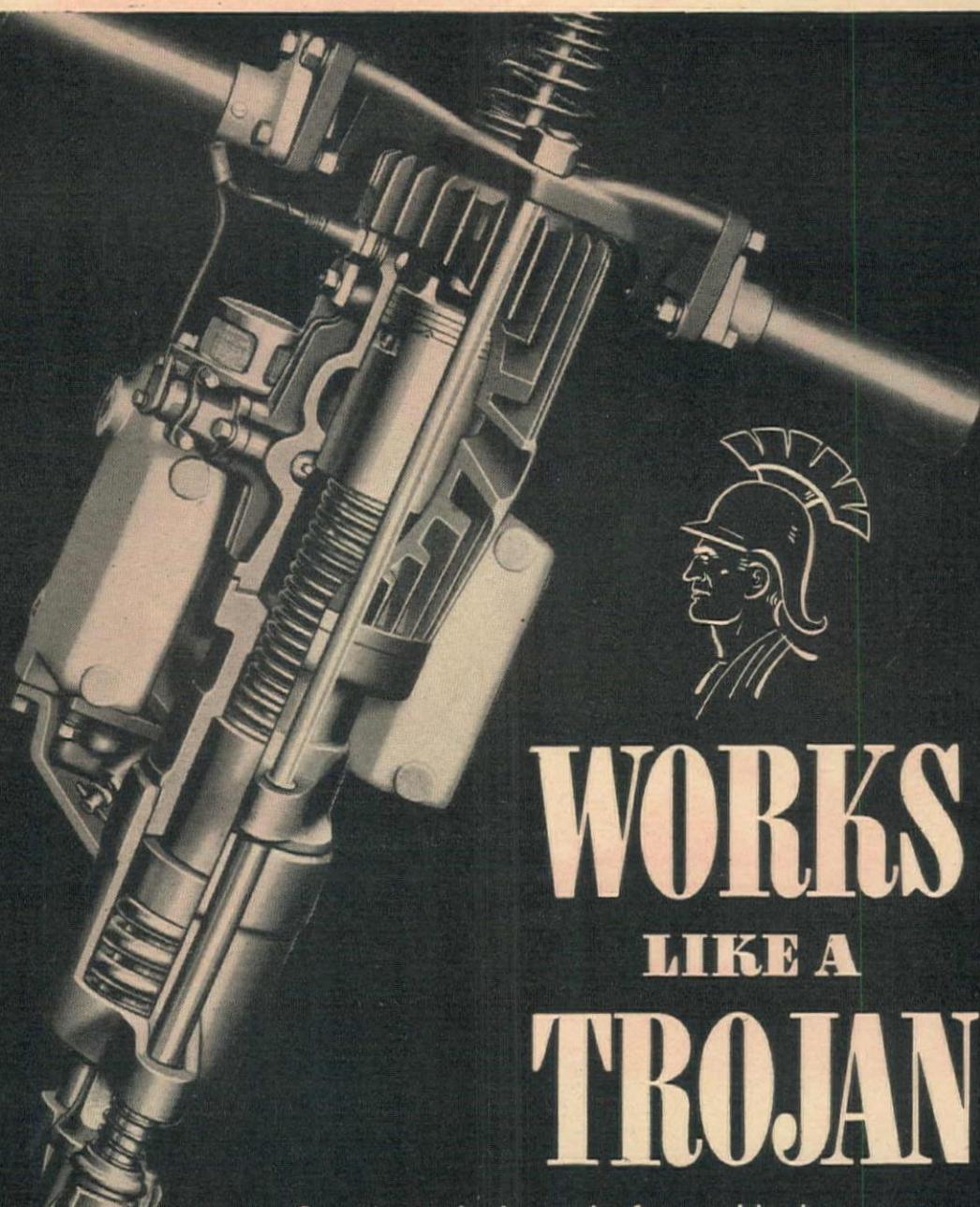
- **Barco** GASOLINE HAMMERS, TAMPERS, SPADES, DRILLERS, SHEETING DRIVERS, FLEXIBLE BALL AND SWIVEL JOINTS
- **Buda** EARTH DRILLS, RAILWAY EQUIPMENT, JACKS, DIESEL NOZZLE TESTERS, PLATFORM TYPE SHOP TRUCKS
- **Vulcan** TOOLS: DRILLS, GADS, CHISELS, SPADES, etc.

Write
or
Wire

FORNACIARI COMPANY

821 So. Santa Fe Avenue

Los Angeles 21, Calif.



WORKS LIKE A TROJAN

Capacity to do the work of several husky men makes a Barco Portable Gasoline Hammer a time and money saver on any job of breaking or drilling. Tireless and rugged, this easily handled tool has the sturdy construction to sustain long punishment when the going is particularly tough. Eleven special tool attachments.

Try One

BARCO

Portable Gasoline Hammers

THE FREE ENTERPRISE SYSTEM IS THE
SALVATION OF AMERICAN BUSINESS

BARCO MANUFACTURING COMPANY, NOT INC., 1819 WINNEMAC AVE., CHICAGO 40, ILL.

CALIFORNIA, WESTERN ARIZONA & NEVADA DISTRIBUTOR • WRITE OR CALL • TELEPHONE TUCKER 9159
FORNACIARI COMPANY, 821 SOUTH SANTA FE AVENUE, LOS ANGELES 21

BUDA TESTED JACKS!

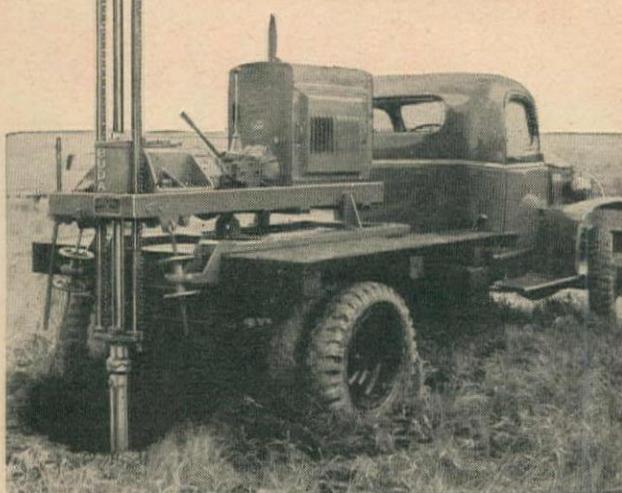
for all Industrial Applications!



... Over 170 models and sizes of Buda Jacks to choose from. Every model individually engineered for a specific application, assuring the use of the correct type of jack to lift the load—safely and economically—with maximum efficiency.

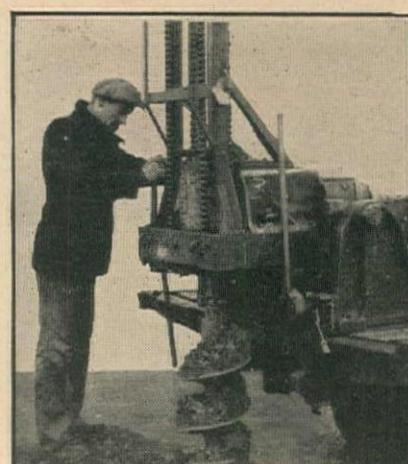
Illustrated at left are three types of Buda Lifting Jacks—the 25 ton ball bearing jack, a 15 ton "all-purpose" automatic lowering jack with a hinge base, and 25 ton high-type hydraulic jack. No matter what type or size jack, they have been carefully tested by actual use on many different types and varieties of applications. Put your lifting problems up to us—we will be glad to show you how to select the best jack for your personal requirements.

BUDA EARTH DRILLS



4 Models—HBB, HBD, HBE and HBH

They have proved themselves superior in a wide variety of hole drilling work. They have proved highly successful in pole line construction, fencing, guard rail installations, pre-boring for piles, agricultural work, soil testing, preventing slides, strip mine testing, for drilling through overburden well drilling and many other uses. Write today for complete details and literature.



Above and to the right show views of two models of Buda Earth Drills that are commonly used by contractors, railroads, highway departments, public utilities and others for solving hole drilling problems. The upper picture shows the Buda Model HBD rigid head type earth drill drilling a 12 inch hole. The lower picture shows Buda Model HBE cradle head earth drill in action.

Write or
Wire-

FORNACIARI COMPANY

821 SANTA FE AVENUE

• LOS ANGELES, CALIFORNIA

TEST DIESEL NOZZLES REGULARLY

for...

top engine

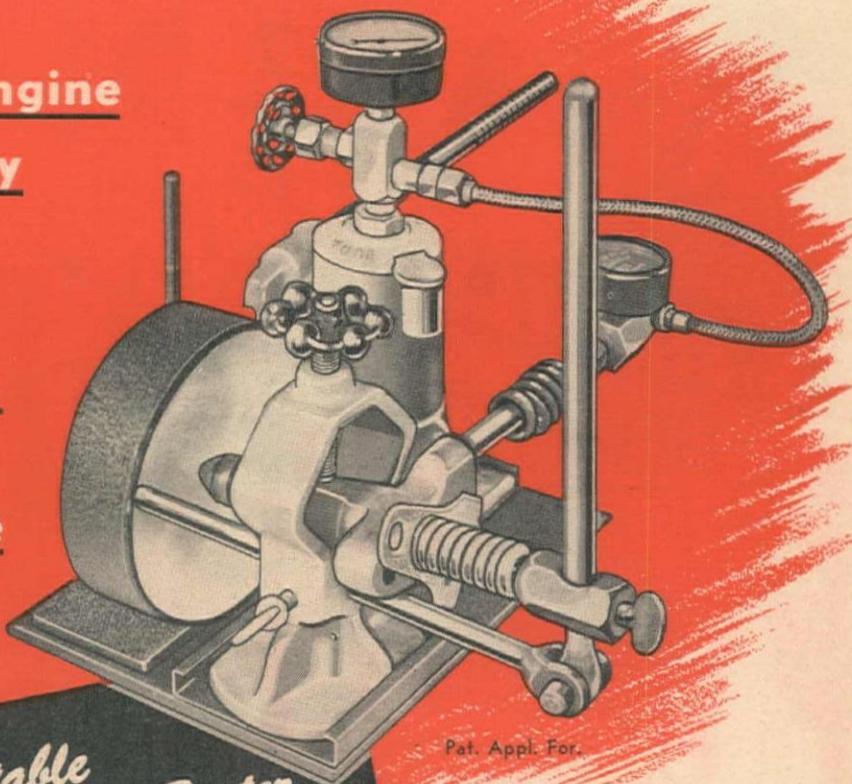
efficiency

lower

repair costs

less engine

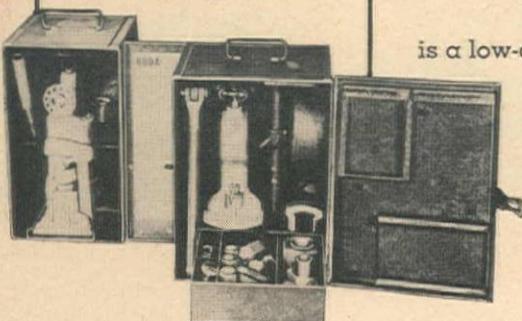
down-time



Pat. Appl. For.

use the Buda portable
Universal Diesel Nozzle Tester

Two light metal boxes
all you have to carry
to test all standard
diesel nozzles!



A few minutes at regular intervals to test diesel nozzles is good insurance against expensive delays for repairs and the possibility of long periods of sub-standard engine performance due to faulty nozzle operation.

With the Buda Portable Universal Diesel Nozzle Tester, you can make quick, accurate tests for leaky valves, faulty spray patterns, sticking needle valves and dribbling nozzles on any type of standard diesel nozzle . . . at the engine.

Easy to carry, set up and use, the Buda Nozzle Tester is a low-cost precision instrument, built to Buda quality standards.



BUDA

15424 Commercial Avenue
HARVEY (Chicago Suburb) ILLINOIS



BUDA Model
2215-SB
"All-Purpose"
Jacks

Write or
Wire—**FORNACIARI COMPANY**

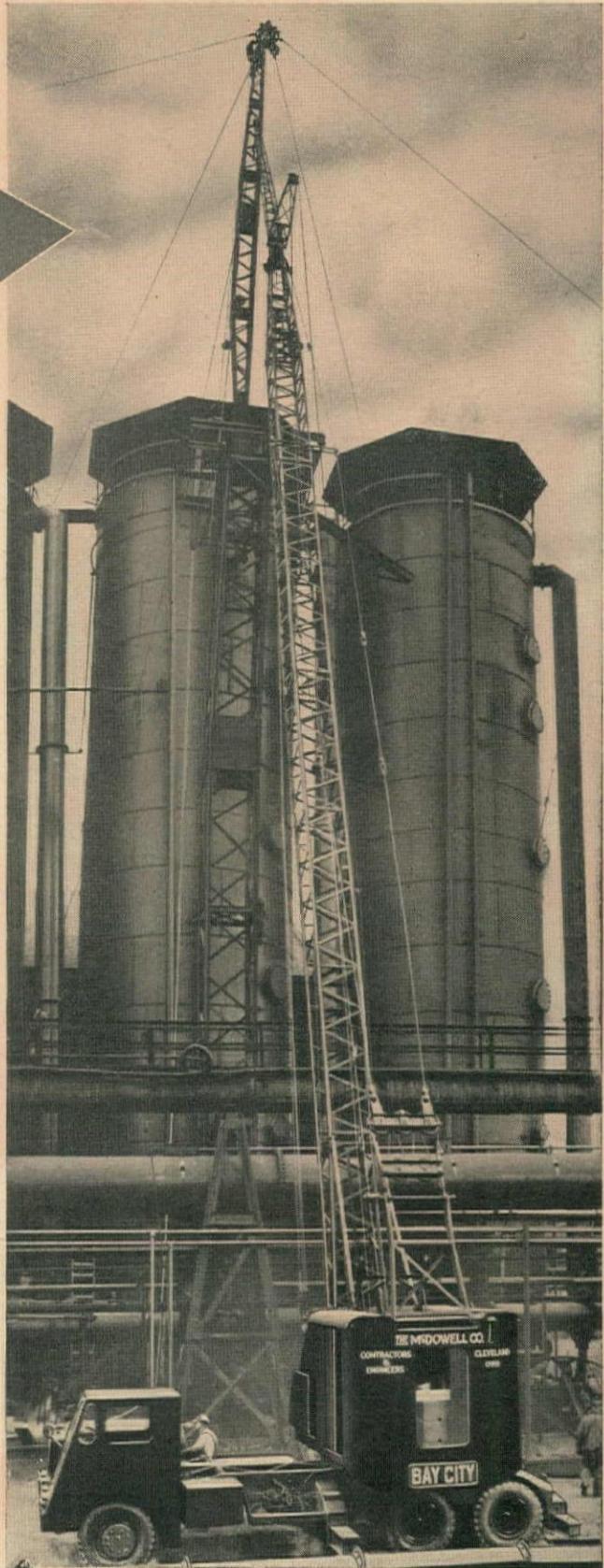
821 SANTA FE AVENUE

• LOS ANGELES, CALIFORNIA



**McDowell Co.
Chooses BAY CITY
CRANE MOBILE
To Speed Repair
on a Midwestern
Steel Plant**

Extensive damage to a Midwestern Steel Plant, (including structures pictured), threatened to slacken war-vital steel production, but reconstruction proceeded with minimum delay despite the 1945 winter weather. The repair job was awarded to The McDowell Company, contractors and engineers, steel erectors, millwrights, blast furnace and mill facility maintenance experts of Cleveland, Ohio. And to lift and swing heavy loads high with sure, swift ease, McDowell chose a 20-Ton Model 18S BAY CITY CraneMobile. 95 ft. boom with 30 ft. jib brought the topmost portion of tanks within easy reach. Here, as in all BAY CITY equipment, rugged construction assured dependable, low-cost performance—fine BAY CITY engineering insured perfect balance and positive stability under capacity loads, CraneMobile mobility speeded and simplified dismantling and re-erection operation. Follow the leaders!—Choose CraneMobile for your material handling where speed, power, mobility, and easy operation count. See your nearest BAY CITY dealer or write BAY CITY SHOVELS INC., Bay City, Michigan.



BAY CITY



**SHOVELS • DRAGLINES
CRANES • HOES • CLAMSHELLS**

SEE YOUR NEAREST DEALER for Bay City excavating and material handling equipment in sizes from $\frac{3}{8}$ to $1\frac{1}{4}$ yards having crane rating up to 20 tons. Both crawler and pneumatic tire mounting.



SWIFT Handling SLICES Man-Hours

... With Power That
Needs No Pampering

In Business to Serve You. Your Case industrial distributor is located and equipped to supply complete service not only on Case tractors and engine units, but on a wide variety of related equipment. His lines are selected and his personnel is trained with your local conditions and requirements in mind. Take advantage of his varied experience in power and equipment applications.



CASE

Scraping, scooping, lifting, carrying and dumping, this Case "DI" Industrial Tractor with Lull Universal loader makes swift work of materials handling. Lifts up to 25 feet, buckets up to 3 cubic yards, bulldozer blades, lifting forks and platforms, rotary brushes and crane arms are available as optional or added equipment.

The stability and extra strength of Case tractors make them a "natural" for high hoists and heavy lifts. The velvet action of their heavy-duty clutches permits swift, smooth scooping or "inch-ing" to precise placement. The "lugging" ability of Case engines, whereby they pull as strong at half-speed as when wide open, gives "steam-like" throttle control of speed both in hoisting and in hauling.

Four basic sizes, with wide variety of wheels and tires, cover a continuous weight range from 2500 to more than 10,000 pounds. Let your Case industrial distributor give you full information. J. I. Case Co., Oakland, Los Angeles.

For Money In Your Pocket PERFORMANCE.

Resists Kinking

Being free from internal stress, it is always easy to handle—never fights back.



Spools Better

Even with a light load, it spools uniformly—is never cranky.



Takes Reverse Bends

Takes this "fatigue" much better, as on rope-ruining elevator installations.



Safer to Handle

Worn union-formed ropes handle as safely as new, as broken outer wires lie close to rope.

Always Relaxed

While it is flexible, and pliant, it has the "toughness" to withstand strain and weight.

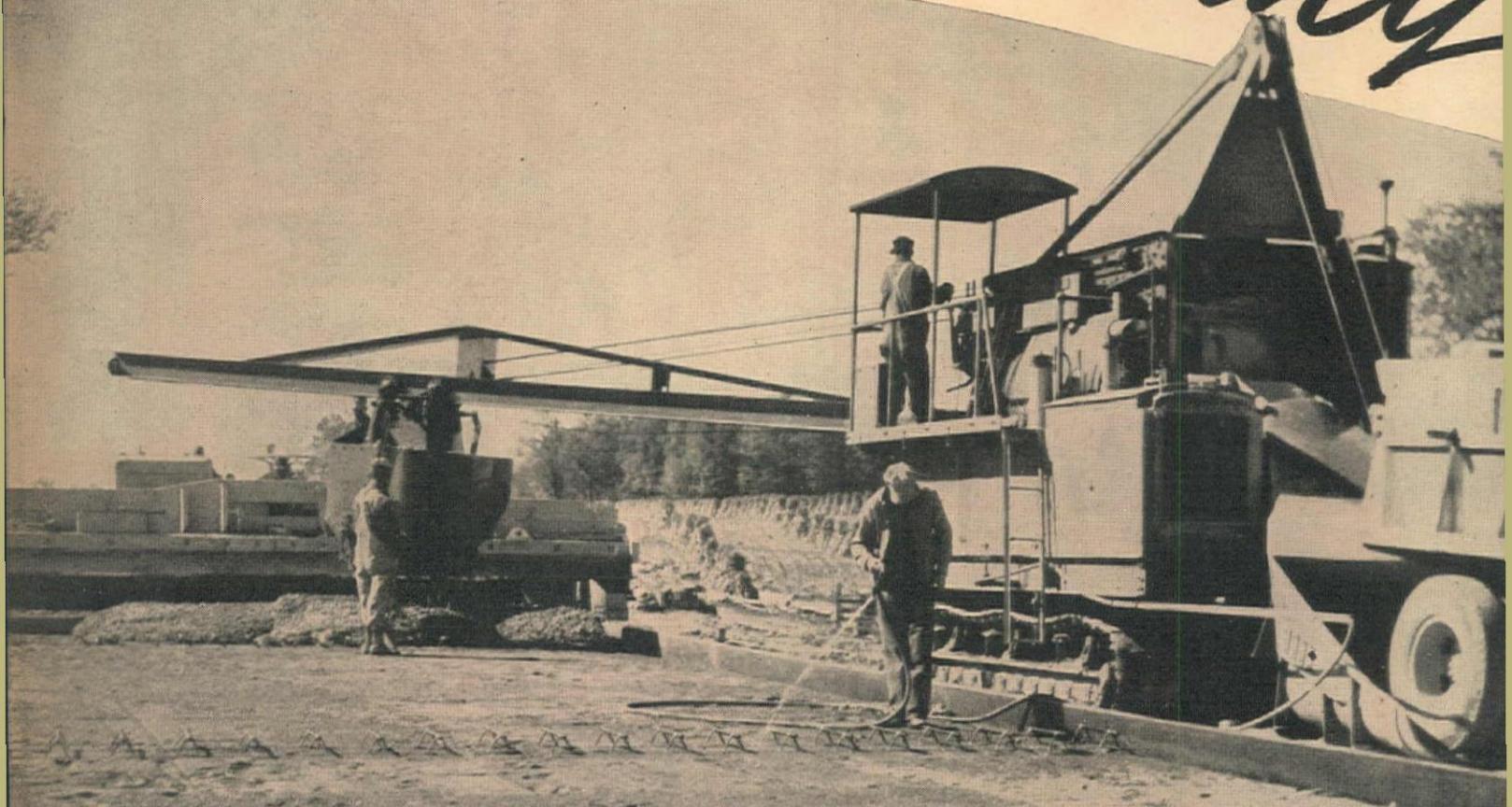


Behaves on Grooves

Resists rotating or twisting in sheave grooves because wires are Preformed.



Announcing



Condensed Specifications

CAPACITY: 34 cu. ft. plus 10% on 6% grades.
Bucket capacity 55 cu. ft.

LOADING SKIP: 118 in. wide. Renewable discharge spout liner.

SKIP HOIST: Hoist drum tapered and spiral machine grooved. Twin Disc clutch. Timken Bearings. 158 sq. in. braking area.

DRUM: MultiFoote Double Cone, Double Compartment. Machined rollers and roller paths. Renewable liners. Rotary discharge and transfer chutes of high carbon steel, renewable wearing plates.

BOOM: Boom 10 in. channels of high carbon steel. Swings, raises and lowers by power. Length 35 ft.

TRACTION: Gear driven. Working speed .6 miles per hr. Travel speed 1.1 miles per hour.

ENGINE: Hercules HXC, piston displacement 779 cu. in. All standard equipment. Power take-off: Twin Disc clutch and a Lovejoy coupling. Diesel power available if desired.

LUBRICATION: All bearings fitted with Alemite-Zerk high pressure grease gun connections.

All the MultiFoote Advantages

A big paver doesn't need to be complicated—look at this simple main drive shaft and clutch assembly! Like the rest of the DuoMix, it is easy to get at, rugged and dependable in operation. Other proved MultiFoote advantages include: Sealed in oil helical-cut-gear power take-off; Timken bearings on all high-speed shafts; MultiFoote Double Cone Drums for thorough mixing; no-pressure water system with large standby tank; wide, solid, fast-charging skip; high, full-visibility operating platform; fast traveling bucket with all mechanism outside; and heavy cross-braced main frame.



New, Exclusive Crawler Design

No "nutcracker" action between treads on this crawler! Exclusive MultiFoote design provides interlocking joints between alloy cast steel tread plates which prevent entry of stones, no matter what position the tread is in. Single drive lugs, on alternate sides of successive treads are completely self-cleaning and have a ball-and-socket action for uniform bearing pressure even on rough ground.



Three Army-Navy "E"
Awards for The Foote
Company!

MULTIFOOTE

Duo Mix
DUAL DRUM

... Specify



union-formed (preformed)

THE ULTIMATE IN LOW COST WIRE ROPE

Precision Constructed to OUTPERFORM ordinary Wire Rope

FIGHT! FIGHT! There is an exhausting fight going on all the time in ordinary wire rope. Each wire is fighting constantly to get out of the fixed position into which it is forced without any preliminary training to put it in shape. This internal fighting spoils the performance, cuts it short, doesn't give you a run for your money.

In **union-formed** Wire Rope each wire is put in shape (*Preformed*) before it ever touches another wire in the rope. The result is exactly the same that comes from a set of conditioned muscles, i. e. finer coordination, greater endurance, top-flight kind of performance that does not let you feel out-of-pocket.

Yes sir! You will always get the most out of the best. The little extra you invest for the best is the part of your investment which will bring the payoff—yield the most dividends. Prove this fact to your own satisfaction. *Specify union-formed*—get money-in-your-pocket performance.



union WireRope

UNION WIRE ROPE CORPORATION

2146 Manchester Avenue

Kansas City 3, Missouri

Tulsa 3 Houston 11 Chicago 6 Salt Lake City 13 New Orleans 16
Monahans, Tex. Portland 10, Ore. Ashland, Ky. Atlanta 1

NEW CHALLENGE Confronts Road Builders

The first challenge came in 1919—first full year after first World War.

That year Americans en masse decided that the automobile was more than a pleasure vehicle—that it was a necessity—the means of transporting them to horizons of greater freedom.

That year we had 6 million automobiles—virtually no surfaced roads. Oregon passed the first gasoline tax law. The Federal Government paid out nearly 3 million dollars to help pay for state road systems.

All states acquired highway departments and passed gasoline tax laws. Planned road building got under way. Road builders met the challenge—got us out of the mud. In ten years we had 23 million motor cars—the life of Americans was transformed—became mobile.

Then, in a 7-year period more than a half billion dollars of state highway funds were diverted for such things as the dole—enough to build 20,000 miles of highway.

New construction was cut deeply. Stymied highway departments lost initiative. Shrunken road building organizations were further drained by the draft and war traffic took a terrific road toll.

But not until war stopped production, did people stop buying cars to boost the total to 33 million.

The first full year after World War II finds us with three-fourths of our roads alternately dust or mud, while in urban areas we're driving bumper to bumper at a pace not much faster than in the old horse and buggy days.

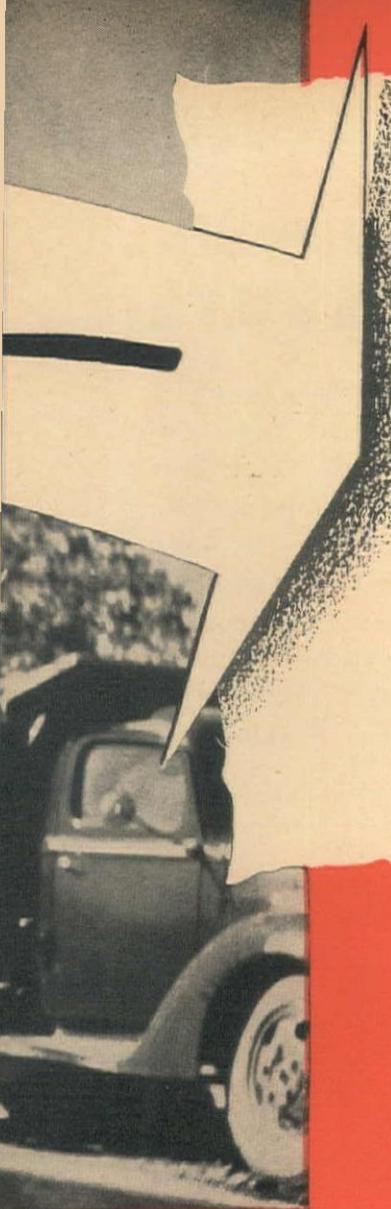
Up To Road Builders To Start One of Nation's Largest Industries On The Move Again

A half billion round Federal dollars are earmarked but can't roll into roads until State, County and Municipal plans are completed and legislative bodies vote matching funds.

Every American has a stake in road building. A seventh of all workers have a big stake because their livelihood depends upon it.

All America now looks to State, County and Municipal highway and street departments to enlarge their professional organizations to speed up plans; to legislative bodies to provide undivertible revenue to match Federal funds; to the raw materials producers to expand output; to the makers of machinery for more and better equipment and to the road contractors to mobilize greater forces and efficient equipment.

This Is The Challenge of 1946. To meet it calls for the **Active Cooperation** of every profession and industry having a part in road building. Let's meet that challenge head on.



the
MULTIFOOTE
Duo Mix
(DUAL DRUM)
34-E CONCRETE
PAVER

High Speed • Real Maneuverability
MultiFoote Dependability for Better
Profit Margins on Your Contracts . . .

HERE are a few of the basic facts about the new MultiFoote DuoMix 34-E Concrete Paver—though you'll have to see this simple, rugged machine in action to fully appreciate all the features for smoothness and speed that made the first contractor who tested it insist on buying the pilot model after the trials were completed.

Mechanical delays in the fully automatic mixing cycle have been cut to a minimum—seconds and fractions of seconds clipped from charging, transfer, discharging and dumping add up to extra, profit-making batches on each day's work . . . Main problem on test jobs was to get batch

trucks coming fast enough to give the DuoMix a fair workout. Under heavy work schedules, there has been no time out for alterations or repairs—MultiFoote dependability worthy of the long line of Foote pavers.

Traveling on narrow shoulders and soft grades brings reports that the MultiFoote DuoMix is "light on its feet," and highly maneuverable for a paver of this size. Details on the exclusive new traction are given at left.

Your order should be in soon for early delivery. Check with your MultiFoote Distributor or write direct today for complete information.

THE FOOTE CO., INC.

1940 State St.

Nunda, N. Y.

34-E CONCRETE PAVER
ADNUN Black Top Pavers
MULTIFOOTE 27-E • SINGLE DRUM 34-E

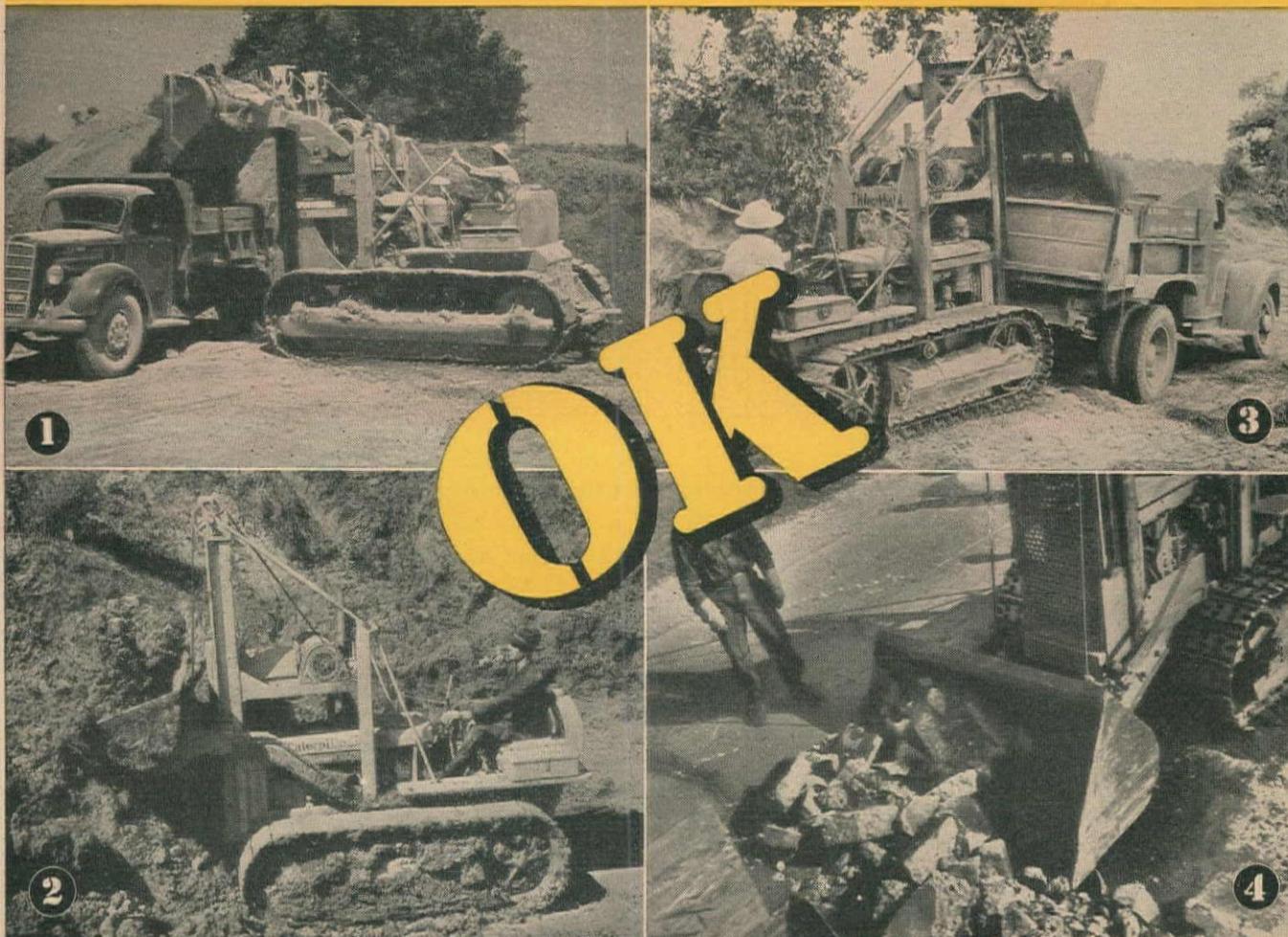
You're **OK** for Performance and Profits when you **TRAXCAVATE!**

IF you like to match performance records with cost records, you'll put your stamp of approval on TRAXCAVATORS. These rugged earth-moving and material-handling machines dig, load, carry, grade, and do so many other essential tasks, they can be kept busy more hours on more jobs. TRAXCAVATORS' versatility pays big dividends in top performance at low cost all year around.

TRAXCAVATORS are built in sizes for every job and purpose, with bucket capacities from $\frac{1}{2}$ to $2\frac{1}{2}$ cubic yards. Bulldozer blade and other handy attachments are also available to further the usefulness of these machines. Your TRACKSON "Caterpillar" dealer will gladly show you why it pays to TRAXCAVATE! See him today, or write for the details to TRACKSON COMPANY, Dept. W.G.-36, Milwaukee 1, Wisconsin.

1. Model T7 TRAXCAVATOR excavating for a new plant in California
 2. Model T2 cleaning a landslide from a highway

3. A Missouri township's T2 loads sand for $1\frac{1}{2}$ miles of road a day
 4. Model T4 taking up and loading old highway concrete



"CATERPILLAR" DIESELS

Stand out because they Stand up



WHEN a competitor says "Those 'Caterpillar' folks are quality-crazy," it's taken as a real compliment. For quality in all products is the first thing "Caterpillar" research engineers, designers, metallurgists and manufacturing heads think about....

Quality that means dependable performance—no costly interruptions, no long or frequent down time. Quality that gives owners low fuel and other operating costs. Quality that assures low maintenance. Quality that reduces repair expense and parts replacements to the minimum. Quality that enables "Caterpillar" equipment to stand up—to lick the tough jobs, run many thousands of hours, assist the contractor to do good work at a substantial

saving to his customers and at an attractive profit to himself.

What is a typical tough job? Levee building, for one. Working in heavy, sticky Mississippi River gumbo in particular. On the project spot-illustrated here, Luhr Bros. Construction used a fleet of scraper-operating "Caterpillar" Diesel Tractors of both track and wheel types. "Zoning" the equipment to fit the hauls and other needs speeded the work, cut cost, made more money.

Floodlighting, for double-shift operation, with a portable "Caterpillar" Diesel Electric Set helped further to shorten the completion time, reduced overhead and enabled earlier release of equipment for the next job.

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

CATERPILLAR DIESEL

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



THE DISCHARGED VETERAN WEARS THIS EMBLEM.
REMEMBER HIS SERVICE AND HONOR HIM.

STOOODY HARD-FACING ALLOYS

*Lengthen the Service Life
of Vital Equipment*



AN APPLICATION of these wear-resistant alloys will result in a definitely longer life for equipment subject to wear and abrasion. Among the most popular Stooody alloys are:

Stooody No. 6 — for oxyacetylene use only, retains its hardness and wear resistance even at red heat. Cold hardness-Rockwell C 42-44, with high ductility . . . Withstands shock and impact without chipping, scaling or developing surface cracks.

Stooody No. 1 — Similar to No. 6 but cold hardness. Rockwell C 53-55 has greater hardness with less ductility and toughness.

Stoodite — a cast alloy steel rod which, when welded on to steel, provides an exceptionally hard, wear-resisting surface. Non-magnetic. Hardness Rockwell C 56 to 60.

Stooody Self-Hardening Rod — low-priced, abrasive-resisting, fabricated of steel strip and carefully selected alloys. Deposit is very tough and will test Rockwell C 50-54. Can be forged without loss of hardness.

Nationwide Airco offices offer a complete line of Stooody Hard-Facing Alloys to cover every variety of hard-facing application. For complete details, call or write your nearest Airco office.

Save Buying Time

Send for your FREE copy of Catalog No. 40. It gives full details on Airco's comprehensive line of gas welding supplies. Address your nearest Airco office or write to Dept. WCN at the local office.



AIR REDUCTION

Western Offices: SAN FRANCISCO, CALIF.; EMERYVILLE, CALIF.; PORTLAND, ORE.; LOS ANGELES, CALIF.; and SEATTLE, WASH.

Offices in All Principal Cities

Represented Internationally by Airco Export Corporation



Everything for gas welding and cutting

PMCO

America's Most Complete Line
of Material Handling Buckets

Dragline Buckets

Sizes— $\frac{3}{8}$, $\frac{1}{2}$,
 $\frac{3}{4}$, 1, $1\frac{1}{2}$,
2, $2\frac{1}{2}$ yds.



Sharpest cutting edge of any dragline bucket

Bottom — One piece 14% manganese steel developing up to 120,000 p.s.i., making possible wide set corner teeth that break up material for easy, fast, penetration.

See Your Equipment
Dealer About
PMCO Buckets

Body — Body sections tapered and rounded for easy dumping of wet sticky material.

Teeth — 14% manganese steel. Reversible socket type, easily removed for replacement. Kept tight in tapered socket by digging pressure.

We operate
the largest
and most com-
plete manga-
nese steel
foundry in the
United States.

Quality Since 1880
PETTIBONE
MULLIKEN
CORP.
CHICAGO 51, U. S. A.

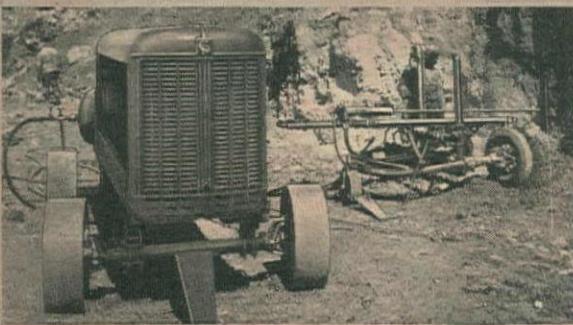


WE MAKE ALL FOUR BUCKETS

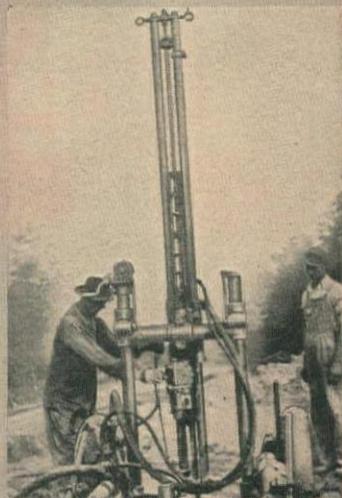
Dependable CP Equipment To Save Time and Money on **EVERY** Job!

For almost 47 years, leading contractors have relied on CP equipment to speed work — and increase profits. One of the world's largest manufacturers of air compressors, rock drills, pneumatic

tools, etc., CP offers efficient, dependable equipment for many contracting needs. Write for Catalog 600, describing complete line of Chicago Pneumatic equipment for the contracting field.



Many refinements of design and manufacture, born of more than forty years' experience, give CP Two-Stage, Air-Cooled Portable Compressors exceptionally high efficiency, dependability and economy. They are available with Hercules gasoline engines in sizes of 60, 105, 160, 210 and 315 c.f.m.; with Caterpillar Diesel engines in sizes of 105, 160, 210, 315 and 500 c.f.m.



Bridging the gap between Hand Sinkers and Heavy-Duty G-500 Wagon Drill, CP G-200R provides one-man operation and faster, lower-cost drilling with the most powerful CP Drifter Drills. Easily moved, G-200R accommodates 6-ft. steel changes; 18 to 24 ft. steels are conveniently handled.



CP Sinker Drills are fully cushioned for low upkeep; valve operated, they maintain their drilling speed despite wear. CP makes a sinker drill for every contracting need, from the light 28-pound CP-22 to 119-pound heavy duty CP-60.



In trench work particularly, CP Backfill Tamers quickly earn their cost by saving the time and labor involved in hauling surplus excavated material. For general tamping, CP-3 is recommended; for heavy tamping CP-MM; for extremely heavy tamping CP-4 is preferred.

Distributors

BALZER MACHINERY CO., Portland, Oregon

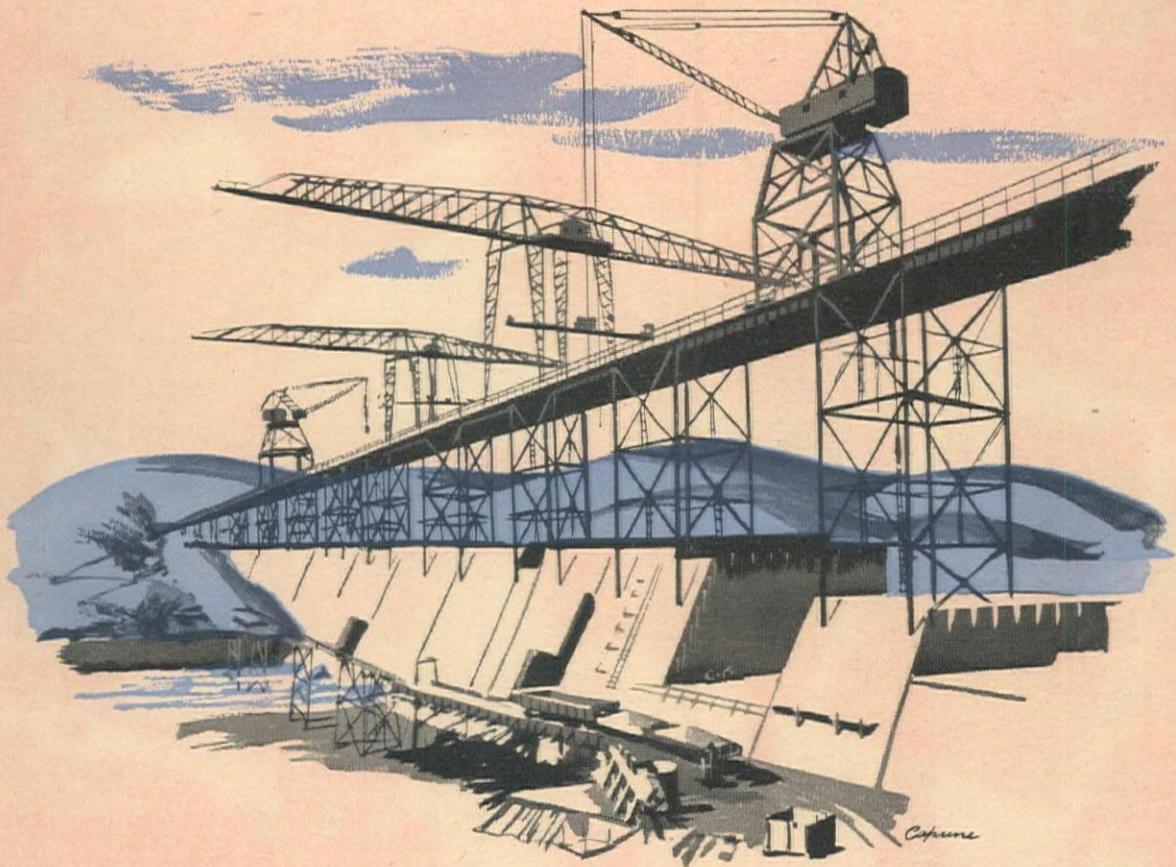
WESTERN MACHINERY CO., Spokane, Washington

HALL-PERRY MACHINERY CO., Butte, Montana

WESTERN MACHINERY CO.
3649 So. Santa Fe Avenue
Los Angeles 11, California

WESTERN MACHINERY CO.
760 Folsom Street
San Francisco 7, California

WESTERN MACHINERY CO.
500 North 16th Street
Sacramento 2, California

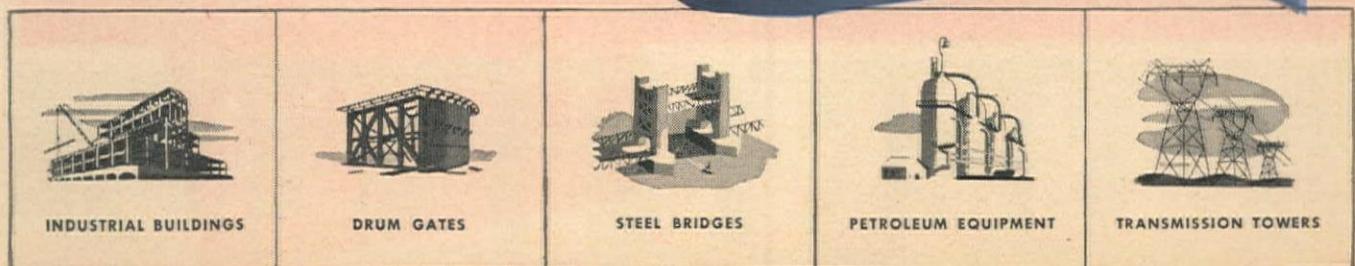
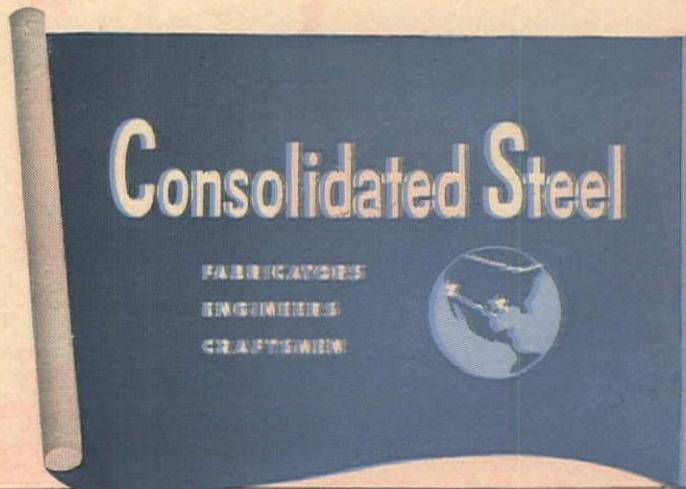


SPECIALISTS IN STEEL

Engineers and craftsmen of Consolidated Steel Corporation know their business well. The unusual steel structures shown here are examples of the diversity and precision of their work.

Should your plans call for new construction, consider the capable services of Consolidated Steel. Immediate attention will be given your inquiry. Address Consolidated Steel, Los Angeles 22, California; or Orange, Texas.

LEADERS IN THE WEST AND SOUTH



INDUSTRIAL BUILDINGS

DRUM GATES

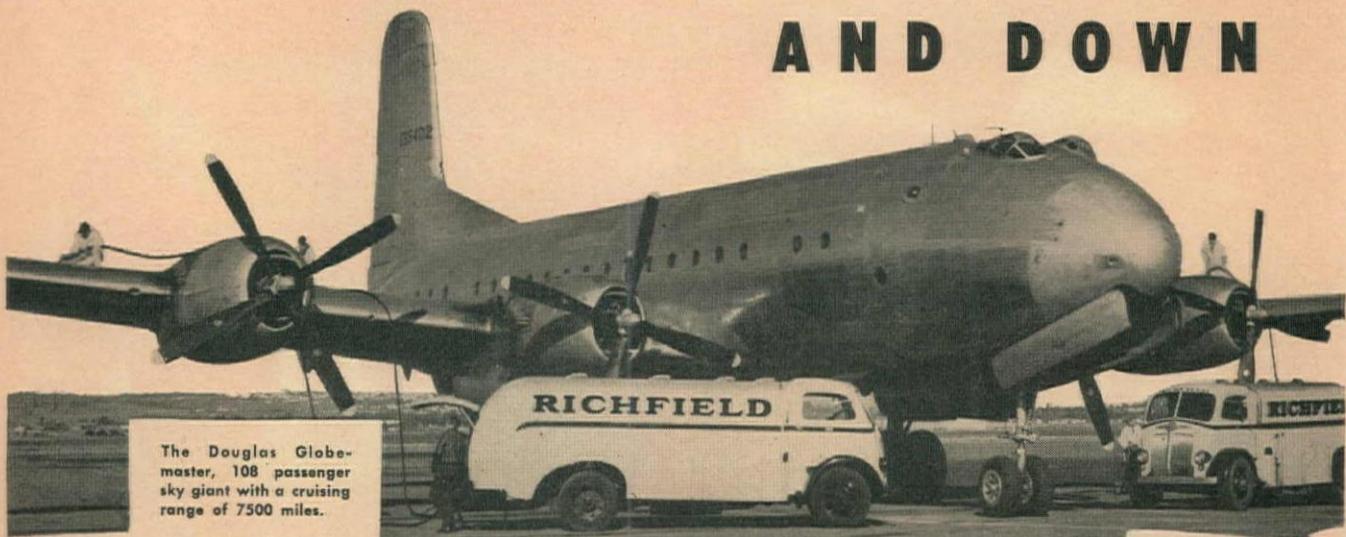
STEEL BRIDGES

PETROLEUM EQUIPMENT

TRANSMISSION TOWERS

UPSTAIRS.....

AND DOWN



RICHFIELD... LEADS THE WAY

Globe girdling planes or mud grubbing 'cats'... Machines that move or machines that produce... Each must have fuels and lubricants that have been tailored to their exacting needs by petroleum specialists.

RICHFIELD has pioneered in the perfection and production of the countless types of fuels and lubricants demanded by Western industry.

Whatever your job... moving a mountain or moving a hundred passengers to London, RICHFIELD can help you.

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

RICHFIELD

BETTER BUILT FOR BEST PERFORMANCE



One way side dump Body with dual telescopic Hoist. Automatic downfold side.



Type Q12 Body with Model T440 dual telescopic Hoist. Capacity 16 cu. yds.



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



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



Rock excavating Body with downfolding gate.



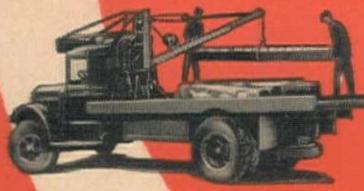
Type W12 Body—Model F4C cam and roller Hoist. Capacity 6 cu. yds.



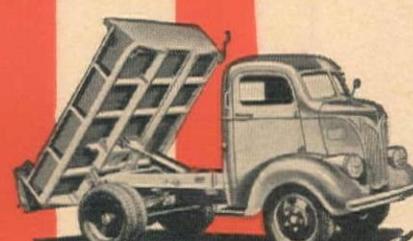
Special scoop end mucker Body. Model F8B cam and roller Hoist. Capacity 5 cu. yds.



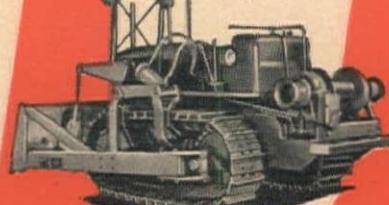
Type W12 Body, front recessed for Model TV83 Hoist. Capacity 15 cu. yds.



Telescopic boom Crane. Radius 8 to 20 feet.



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



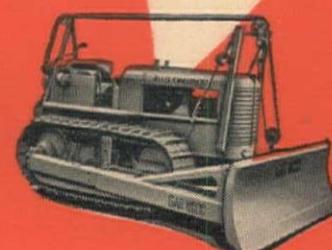
Bulldozer and rear mounted Winch.



Type W12 Body and single telescopic Hoist. Double acting tail-gate Capacity 4 cu. yds.

TRADE MARK

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



Cable Dozecaster with angling blade.

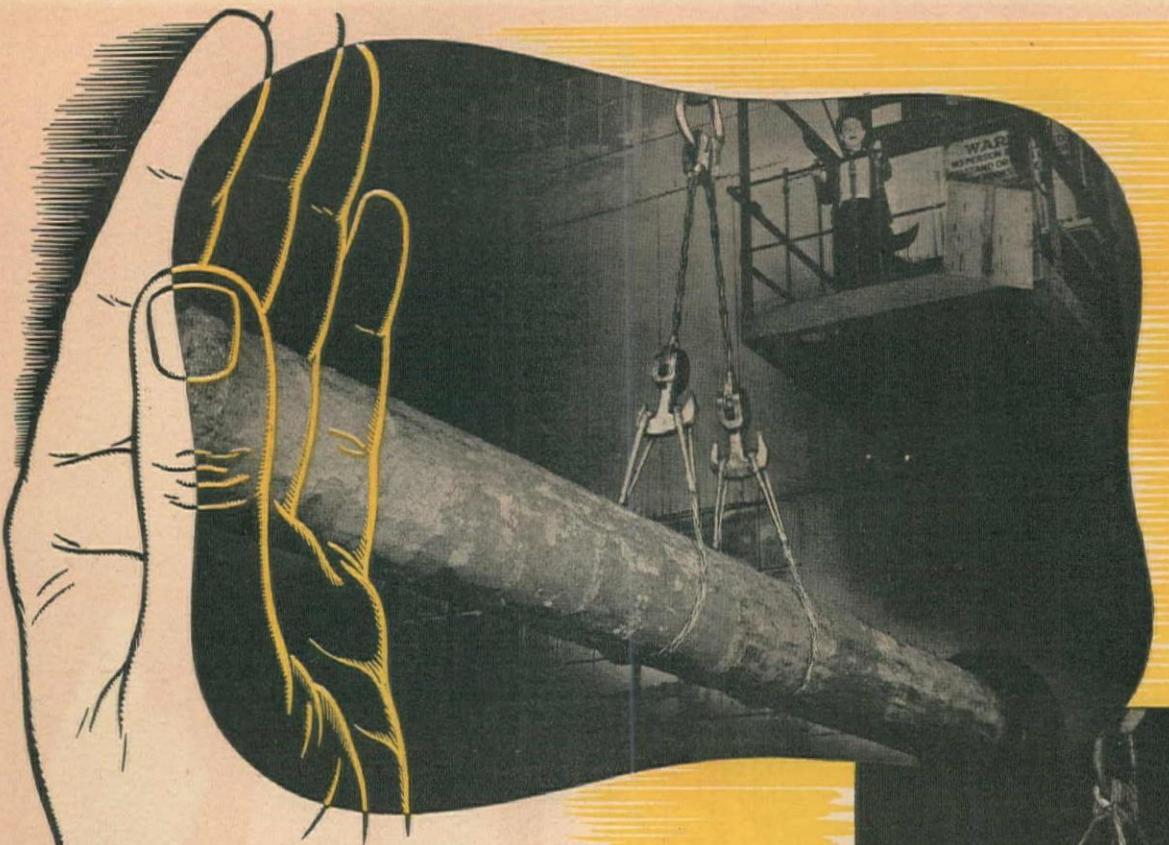


GAR WOOD INDUSTRIES, INC.

7924 RIOPELLE ST. • DETROIT 11, MICH.

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

OTHER PRODUCTS: TANKS • HEATING EQUIPMENT • MOTOR BOATS



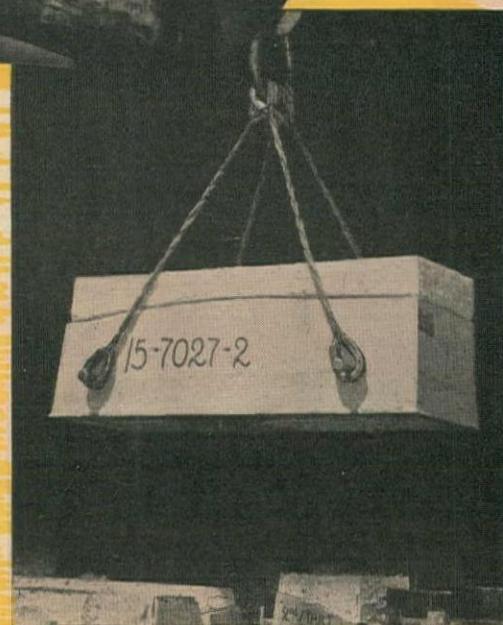
LET 'ER TRAVEL!

Materials move quickly...
smoothly... carried by flexible
YELLOW STRAND BRAIDED SLINGS*

When a job's moving on schedule, it's costly to have it slowed by sling equipment. What you want—in factory, shop, warehouse or yard—is *flow* in the handling of sling loads. Yellow Strand Braided Safety Slings promote this smoothness. Their flexibility, kink-resistance and light weight enable operators to give each lift more accurate control... to run a series of pickups without wasted time or motion.

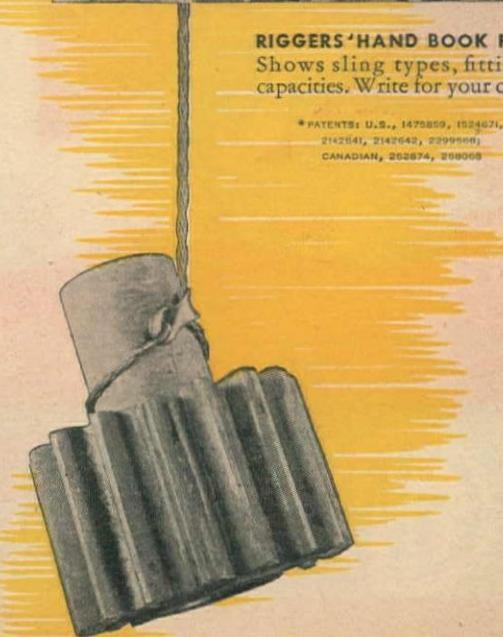
Patented braiding puts added limberness into long-wearing Yellow Strand Wire Rope. The sling conforms to odd shapes, grips curved objects firmly, takes thimbles, turnbuckles and other fittings readily. Weighing less than chain, braided slings are easily carried, fastened and detached, using a minimum crew. Employees welcome their security on big tonnage lifts, their Manila-like convenience for small jobs.

Yellow Strand Braided Slings are practicable for loads ranging from a 40-lb. drum to a 300-ton locomotive. Send details of your application now and let B&B engineers offer a recommendation. Broderick & Bascom Rope Co., St. Louis 15, Mo. Branches: SEATTLE, Portland, New York, Chicago, Houston. Factories: SEATTLE, St. Louis, Peoria.



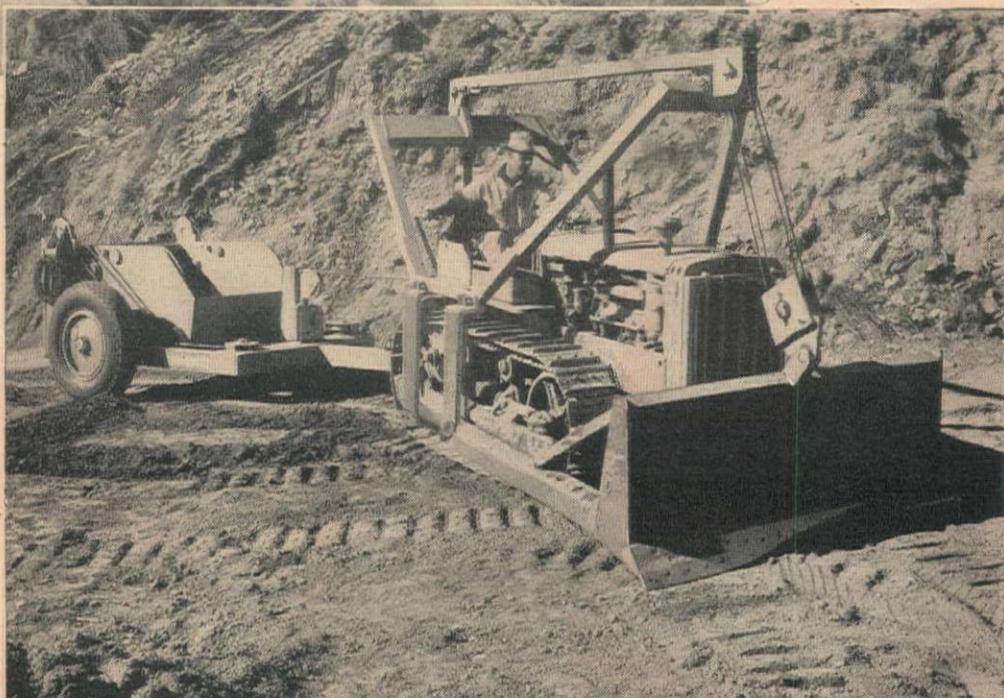
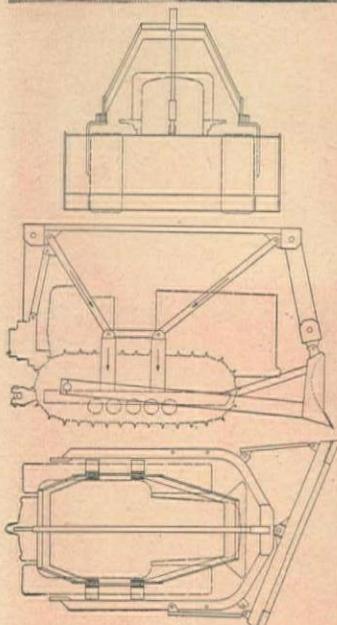
RIGGERS' HAND BOOK FREE
Shows sling types, fittings,
capacities. Write for your copy.

* PATENTS: U.S., 1475859, 1524671,
2142541, 2142642, 2299595;
CANADIAN, 262874, 268068



BRODERICK & BASCOM
Yellow Strand
BRAIDED SAFETY SLINGS

SOUTHWEST Cable Dozers



ANY WAY YOU LOOK AT IT . . . front, side or top . . . it's the slickest thing on two tracks. The "A Frames" and TWO "Over Center Track Mounted" brackets distribute the load evenly over the entire track frame, utilizing maximum tractive effort. No twisting, teeter-totter, action here.

MANY ADVANTAGES are also offered by Southwest Single Cable Controlled Rear Dump Hauling Scoops. Combination dozer-scoop hook-ups like the one pictured above are very popular—especially when both can be operated from one double drum Power Control Unit. Write for complete literature.

REMEMBER TOO. Southwest builds for all four makes of track-type tractors.

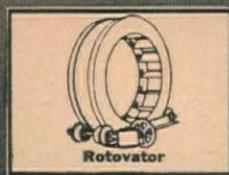
CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

ALHAMBRA, CALIFORNIA



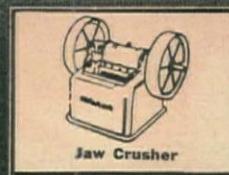
MORE FOR YOUR CRUSHING DOLLAR WITH UNIVERSAL "BASIC UNITS"



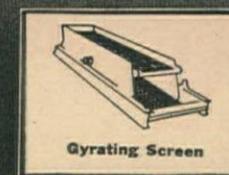
Rotovator



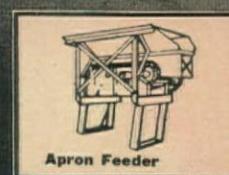
"Channel" Conveyor



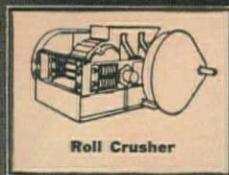
Jaw Crusher



Gyrating Screen



Apron Feeder



Roll Crusher



THE 293Q "PACEMAKER"

A Complete Dual Crusher Quarry Plant on Wheels Made From Seven Balanced Universal Basic Units

"Basic Units" are the fundamental parts (jaw and roll crushers, pulverizers, elevators, conveyors, hoppers, bins, feeders, sand drags, sand screens, settling tanks, gyrating screens, etc.) upon which all successful crushing, screening and washing depends. Universal builds over 20 "Basic Units" which offer the following advantages to producers:

1. ADD TO PRESENT EQUIPMENT

Universal "Basic Units" are soundly designed to produce top quantities of specification products, and built of the finest materials to assure long service life. They are made in sizes and types to fit into any existing set-up to increase plant efficiency and output, or to produce a different product.

2. GET A TAILORED-TO-MEASURE PLANT AT STANDARD PRICES

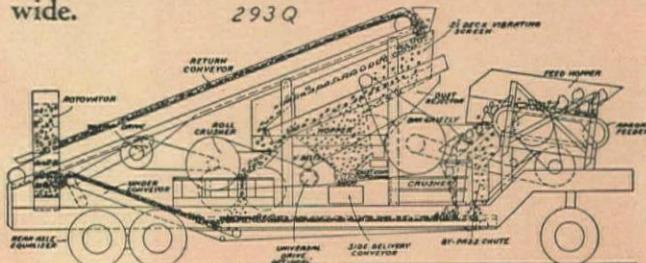
By using "Basic Units," practically "off the shelf," Universal engineers can build plants to meet any needs, thus effecting important savings in initial cost.

3. GET A COMPLETE BALANCED UNIVERSAL BUILT AND DESIGNED PLANT

Many standard plants of superior design such as the 293Q "Pacemaker" Portable Quarry Plant, shown above, are made from Universal "Basic Units." The "Pacemaker" features Universal's

exclusive Two-In-One Rolls which handle two sizes of material at one time, thus producing large capacities by permitting jaw crusher to be opened wide.

293Q



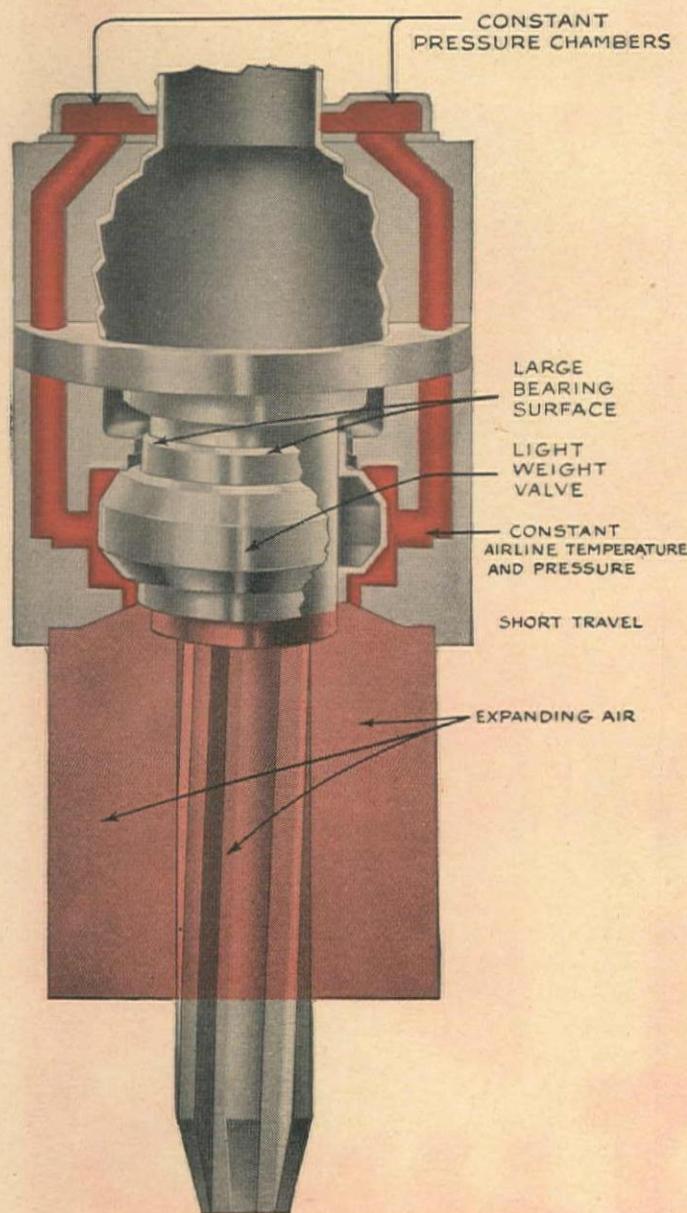
Investigate the many advantages of Universal "Basic Units" and complete plants to assure yourself of larger profits from the coming construction activity. Send for Bulletin today!

Universal Engineering Corporation

323 8th Street West
Cedar Rapids, Iowa



WHY LEADING CONTRACTORS SPECIFY *Thors*



Thors

**ROCK DRILLS
and BREAKERS**

The ENGINEER knows that...

Thor's Light Weight, Short-Travel Valve

Produces More Work—Cuts Operating Costs!

The Valve is to an air tool what the carburetor is to an automobile engine . . . the *vital heart* controlling the inlet of power. So intricate is the valve, however, that only engineers who know its function recognize what benefits it can contribute to an air tool's performance and service life.

Leading engineers everywhere specify Thor Tools because Thor valves provide *faster, better work—at lower operating costs—* through these features:

SPEED . . . Air Economy. Extremely light in weight, the Thor Valve moves faster to provide more blows per minute. It maintains this relative high efficiency even at low air line pressures.

POSITIVE ACTION. Light weight, short-travel—and the important fact that the Thor Valve is actuated by the difference between air line pressure and exhaust pressure—assures positive action that *completes every blow*.

ENDLESS LIFE. Light weight and short-travel—plus the *large bearing surface* on which the Thor Valve operates—eliminates breakage . . . reduces wear to a minimum.

NON-FREEZING . . . Never "Air-starved." Constant pressure chamber maintains air at constant line temperature and pressure. Air cannot expand until it passes valve . . . thus valve cannot "freeze."

EXACT TIMING and BALANCE. All these valve functions are in perfect-timing and balance with the piston hammer. Every stroke is air-cushioned; every blow is complete and powerful.

Have your engineer check these Thor advantages. He'll agree—your nearby Thor Distributor stocks the tools that will give you more work . . . at lowest cost!

INDEPENDENT PNEUMATIC TOOL COMPANY

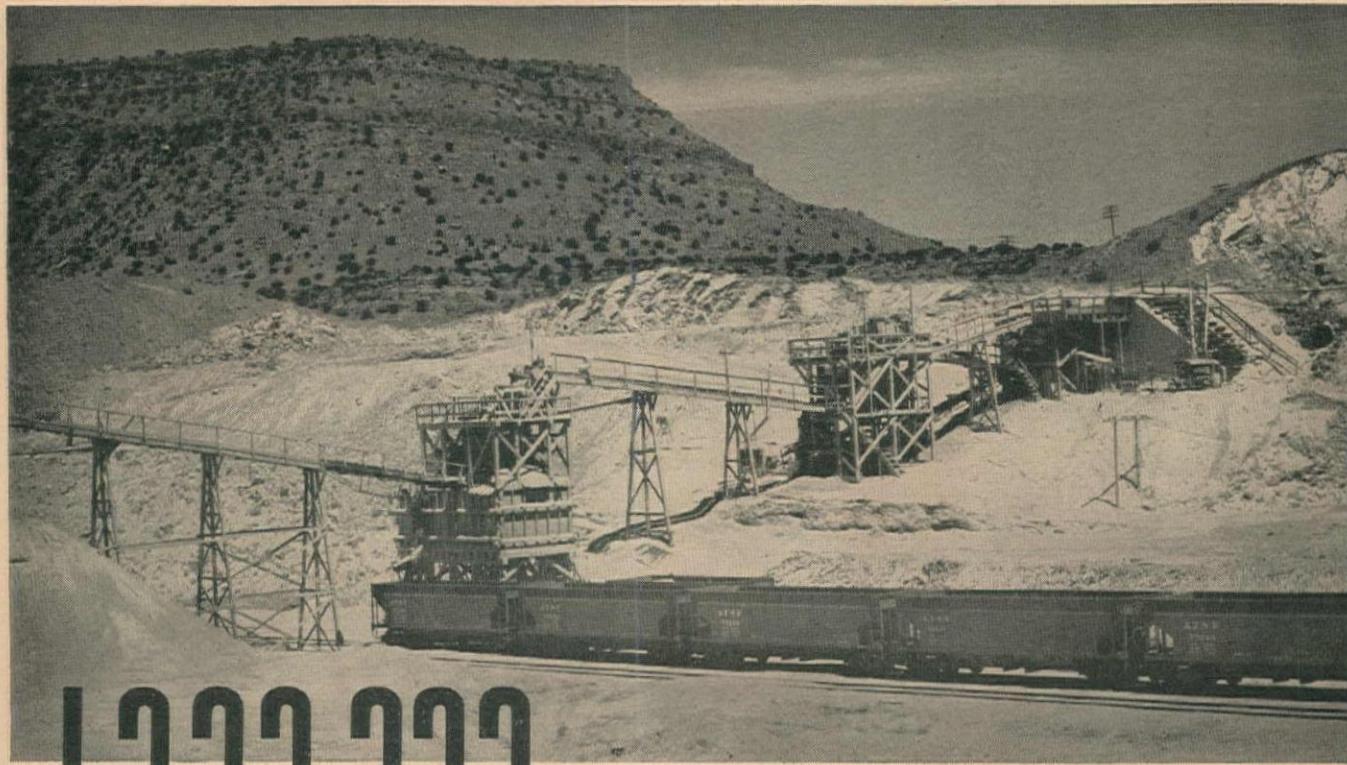
600 W. Jackson Boulevard, Chicago 6, Illinois

BIRMINGHAM BOSTON BUFFALO CLEVELAND DETROIT LOS ANGELES MILWAUKEE NEW YORK PHILADELPHIA
PITTSBURGH ST. LOUIS SALT LAKE CITY SAN FRANCISCO TORONTO, CANADA LONDON, ENGLAND

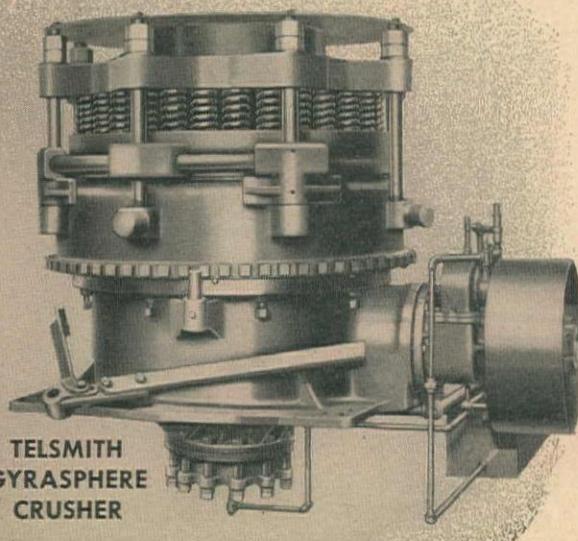
Thors . . . **PORTABLE POWER
TOOLS**

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

... FOR THE **A**TCHISON **T**OPEKA AND **S**ANTA **F**E



1,333,333 CUBIC YARDS OF BALLAST
... IN 5 YEARS with **TELSMITH**



TELSMITH
GYRASPHERE
CRUSHER

They use a lot of ballast on the A.T.S.F. Ry. Much of it is supplied by the Sharpe & Fellows Contracting Co. of Los Angeles, California. This is one of their quarries—at Sais, New Mexico, southeast of Albuquerque. Here a 48" Telsmith GyraspHERE Secondary Crusher, powered by a D-17000 Diesel engine, has crushed $1\frac{1}{3}$ million cu. yds. of hard rock down to ballast size, in the past five years. Their crushing plant is also equipped with two 5' x 12' Telsmith Double Deck Pulsator Screens.

If you want a secondary crusher that works at choke feed... crushes finer... that turns out *enormous* tonnage... all of it remarkably uniform... and does it with lowest upkeep, get a Telsmith GyraspHERE. Telsmith Pulsators assure efficient, low-cost screening. Send for Telsmith Complete Plant Bulletin Q-30.

Q-15

SMITH ENGINEERING WORKS, 4010 N. HOLTON STREET, MILWAUKEE 12, WISCONSIN

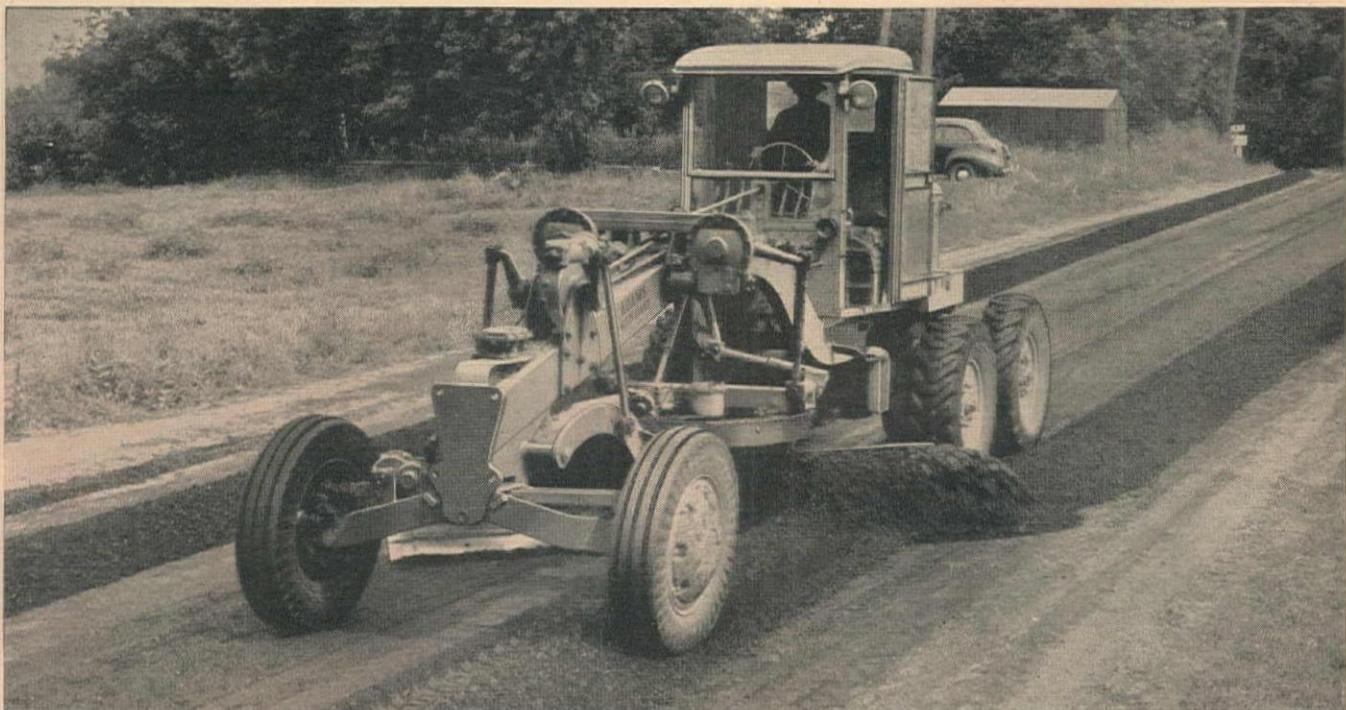
Mines Engineering & Equipment Company, 369 Pine St., San Francisco 4—811 W. 7th St., Los Angeles 14

Clyde Equipment Co. Clyde Equipment Co. General Machinery Co. Gordon Russell, Ltd. Contractors' Eqpt. & Supply Co.
Portland 9, Ore. Seattle 4, Wash. Spokane 1, Wash. Vancouver, B.C. Albuquerque, N.M.—El Paso, Tex.



GAITED

To Every Job Requirement



8 OVERLAPPING FORWARD SPEEDS give Adams Motor Graders exactly the right "gait" for every type of grading operation . . . for ditch and bank cutting—for blading and scarifying—for aggregate mixing and spreading . . . plus transport speeds up to 21 m.p.h. for fast moving from job to job.

Translated into end results, Adams' flexible range of speeds means *fastest practical operation on every job—more work per day—more profitable operation . . .*

What's more, in Adams Motor Graders you get a host of other features essential to efficient, long-life performance . . . rugged strength—rigidity—balanced weight distribution—fast, accurate blade controls—wide range of usefulness—minimum operating and maintenance costs.

Phone or visit your local Adams dealer. He will gladly show you why it's always good business to specify Adams Motor Graders.

J. D. ADAMS MANUFACTURING CO., Indianapolis, Indiana

LOCAL *Adams* DEALERS

CALIFORNIA

Western Factory Branch
J. D. ADAMS MANUFACTURING CO.

230 7th Street, San Francisco 3

Adams Distributors at: San Francisco, Los Angeles, Sacramento, Redding, Riverside, San Jose, Fresno, Stockton, Salinas, Santa Rosa, Modesto, Visalia and Merced

ALASKA—Glenn Carrington & Co., Fairbanks

ARIZONA—O. S. Stapley Company, Phoenix

COLORADO—McKelvy Machinery Co., Denver

IDAHO—Intermountain Equipment Co., Boise, Pocatello

MONTANA—Industrial Equip. Co., Billings, Missoula

NEVADA—Brown Motors, Reno

NEW MEXICO—Hardin & Coggins, Albuquerque

OREGON—Howard-Cooper Corp., Portland, Eugene

UTAH—The Lang Company, Salt Lake City

WASHINGTON—Howard-Cooper Corp., Seattle

Intermountain Equipment Co., Spokane

WYOMING—Industrial Equip. Co., Billings, Mont.

The Lang Company, Salt Lake City, Utah

READY TO FABRICATE SURPLUS

Aluminum

AT 15% TO 45% LESS

(FOB Location)

GOVERNMENT-OWNED STOCK

Here—in production quantities—is the aluminum you need at fixed prices, 15% to 45% off current mill prices, depending on the particular alloy. Much of this special value stock, originally ordered for war plane construction, is still in its original packing. It may be readily fabricated and is available in standard sizes and shapes. Perhaps this material is just what you need to get into full civilian production faster and it costs nothing to find out. Take these three simple steps today:

1. Estimate, for any convenient period, your production needs in each specification, finish, gauge, etc.
2. Then write, wire, or phone that data to your nearest War Assets Corporation office* below. We will advise you of the location of the stock you need, estimate possible delivery dates, quote prices and help arrange credit where indicated.
3. When satisfactory arrangements have been made, we will start shipments.

* NEW SURPLUS STOCK RELEASED DAILY

War Assets Corporation is a Reconstruction Finance Corporation subsidiary in charge of disposing of surplus war materials constantly being released to War Assets Corporation. To reach War Assets Corporation, simply contact your nearest R.F.C. office listed below.

VETERANS OF WORLD WAR II:

To help you in purchasing surplus property from War Assets Corporation, a veterans' unit has been established in each War Assets Corporation Regional Office listed below.

A DISPOSAL AGENCY DESIGNED BY THE SURPLUS PROPERTY ADMINISTRATION for Surplus Producers' and Capital Goods, Aircraft and Plants formerly handled by Reconstruction Finance Corporation, and for Surplus Consumer Goods formerly handled by United States Department of Commerce.

ATTENTION

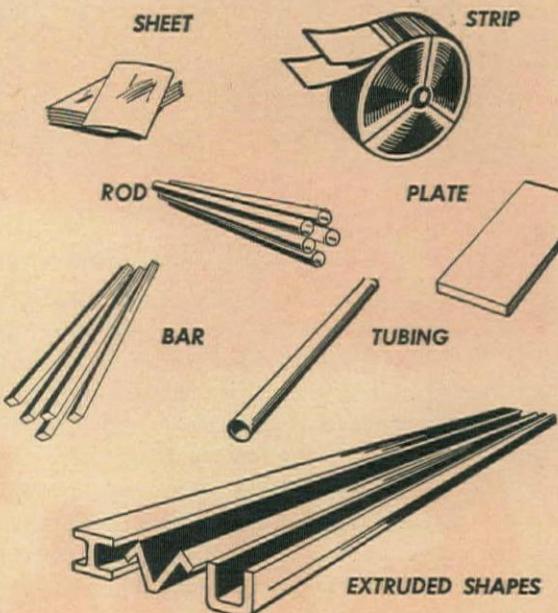
POWDER

METALLURGISTS!

Atomized Aluminum powder—not suitable for paint without further processing—is available in enormous quantities at 10¢ per pound. Can you find a major use for this product? If you can . . . ! ! ! Get detailed specifications from your War Assets Corporation office listed below.



TYPES AVAILABLE



WAR ASSETS CORPORATION

(A SUBSIDIARY OF RECONSTRUCTION FINANCE CORPORATION)

RFC OFFICES (INCLUDING FORMER DEPARTMENT OF COMMERCE REGIONAL SURPLUS PROPERTY OFFICES) LOCATED AT: Atlanta
Boston • Chicago • Denver • Kansas City, Mo. • New York • Philadelphia • San Francisco • Seattle • OTHER RFC SURPLUS
PROPERTY OFFICES LOCATED AT: Birmingham • Charlotte • Cleveland • Dallas • Detroit • Helena • Houston • Jacksonville
Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • Oklahoma City • Omaha • Portland, Ore.
Richmond • St. Louis • Salt Lake City • San Antonio • Spokane • OTHER FORMER DEPARTMENT OF COMMERCE REGIONAL
SURPLUS PROPERTY OFFICES LOCATED AT: Cincinnati and Fort Worth

157-3

**Train Apprentices Right
with faster-working
SKILSAW**

... the way they do
in Cleveland, Ohio

*Veterans Learn
Building Trade
and Help Bud-*

By WILLIAM BEABOUT
This is a story about some
returned war veterans who are
learning the business of build-
ing homes to house some of
the veterans who have not yet
come home.

It's a story of the building trades
and what the trade is doing to re-
establish the returned war heroes.

The first chapter



*Veteran carpenter, above, demonstrates
power circular saw on construction
site. Other veterans, left, are shown
laying brick and working on other
construction projects.*

Photographs
from the Cleveland PRESS

• Apprentices learn modern building methods quicker . . . become productive for you at once when you train them with SKILSAW right from the start. One apprentice with a SKILSAW can keep 6 veteran carpenters busy laying-in and nailing. Ask your distributor to show you the many ways to save time and money with SKILSAW on every cut in construction work.

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

**PORTABLE ELECTRIC
SKILTOOLS**
MADE BY SKILSAW, INC.

SKILSAWS

SKILSANDERS

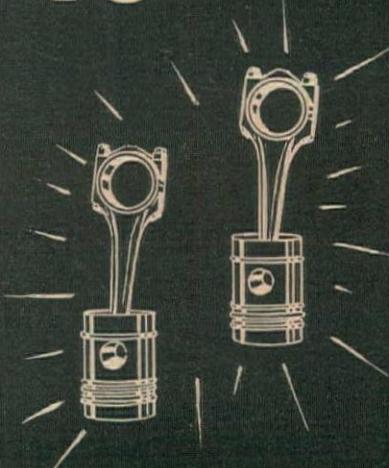
SKILSHEAR

SKILNIBBLER

SKILDRILLS

SKILGRINDERS

keeps motor parts like new



Cadel A.P. Heavy Duty Lubricant

A detergent-dispersive-inhibited all-purpose compounded motor oil for both diesel and gasoline engines in heavy duty operation that improves lubrication and reduces maintenance costs. In SAE viscosities 10, 20, 30, 40, and 50.

• • •

Repeated tests in all kinds of equipment have proved time after time that this remarkable oil promotes longer engine and

bearing life, cleaner engines, oil passages and filter elements, free piston rings and valve stems, easier starting at low temperatures and economical oil consumption. Engines actually *look like new* when torn down after long operating periods. Ask your Associated Representative for complete information on how Cadel A.P. can benefit you.

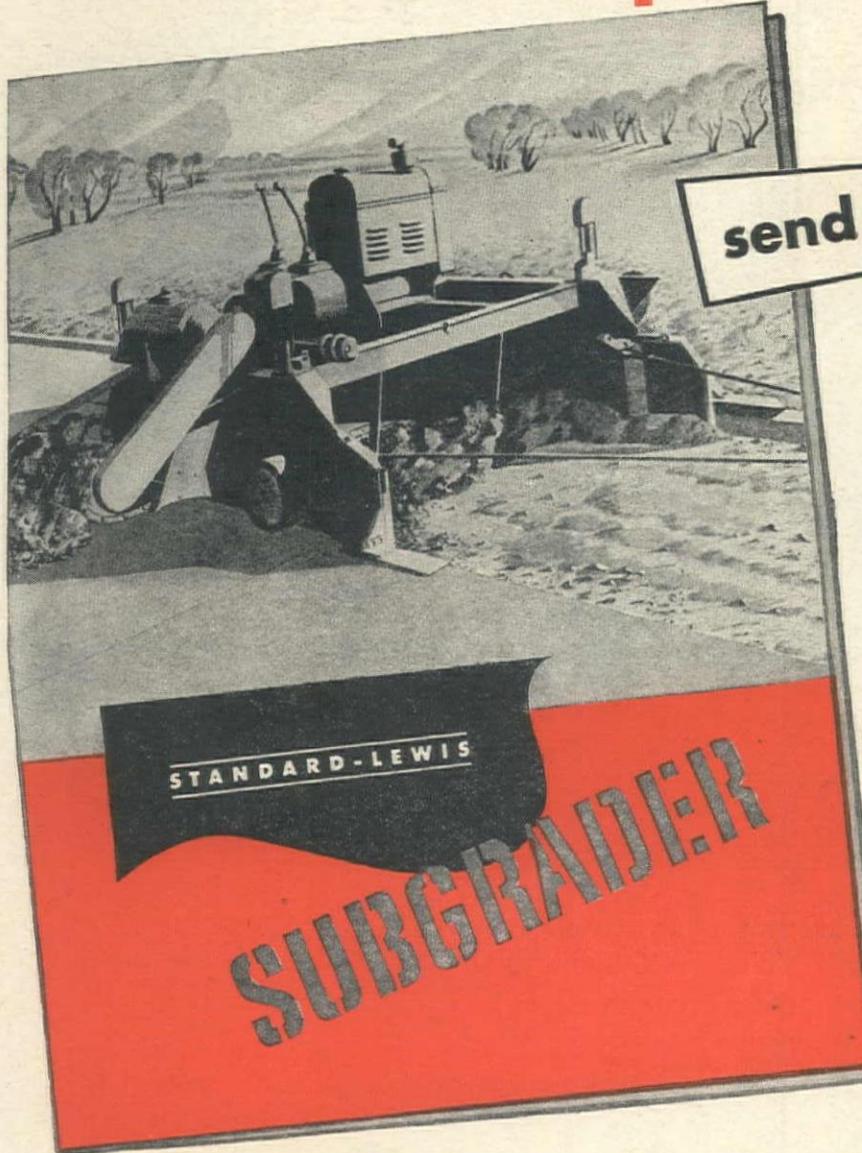
Tell Your Associated Dealer You Want a Credit Card

**Correct Lubrication
is Machinery's Most
Vital Need**



**TIDE WATER
ASSOCIATED
OIL COMPANY**

For Complete Facts



send for this folder

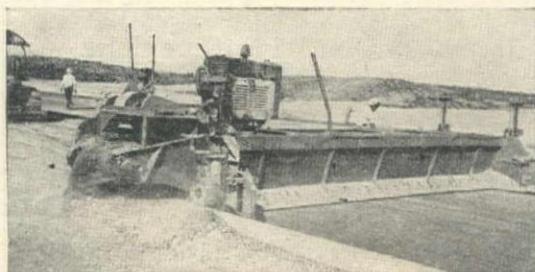
The many unique features embodied in the new Standard-Lewis Subgrader come as a result of design by practical paving equipment engineers. These men know well the problems encountered and have built into this machine many practical improvements that save contractors, time, labor and money.

The new Standard Steel 8-page folder covers in detail all information relating to the efficient operation and economy provided by this ingenious Subgrader.

A request on your letterhead will bring a copy promptly.



This is an example of deep cutting into tough material—gravel as large as 14" in diameter is handled with ease.



No chipped or broken edges of concrete pavement is experienced with the solid rubber tired wheels you can use on the STANDARD-LEWIS Subgrader.

STANDARD
STEEL CORPORATION

General Offices and Plant: 5001 South Boyle Avenue
Los Angeles 11, California

Here's why the **ATLAS ROCKMASTER** *improves breakage, reduces vibration and backbreak*



THE skillful boxer lands a left to the jaw, then follows it quickly with a blow from the right. Two short jabs in fast succession—but they accomplish what even the strongest *single* blow would fail to do.

This principle of the one-two punch is what Atlas applies to the Rockmaster Blasting System. First the rock is stressed to the breaking point—then, a split second later, it is hit again. Result: sensational improvement in fragmentation.

But that's not all that Rockmaster does. This new method of blasting has also drastically cut down noise and concussion . . . reduced secondary blasting to a minimum . . . practically eliminated backbreak. Rockmaster can almost certainly do better work for you, too . . . with your knowledge of the job plus the Atlas representative's special knowledge of explosives. Call him in.

Offices in Principal Cities

ATLAS EXPLOSIVES

"Everything for Blasting"

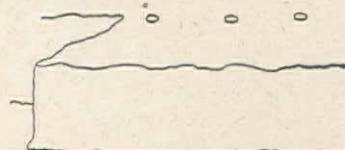
SAN FRANCISCO 4, CAL.

ATLAS POWDER COMPANY



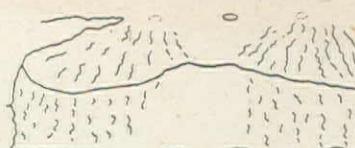
SEATTLE 1, WASH.

FIG. A



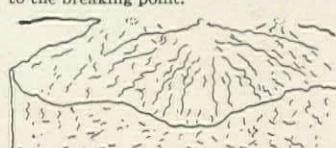
Alternate holes are loaded with "A" Rockmasters and with "B" Rockmasters.

FIG. B



Detonation of "A" Rockmasters places rock under tremendous tension—almost to the breaking point.

FIG. C



Split-seconds later, the "B" Rockmaster completes the job—thoroughly shatters the rock.

Winston-Utah-Vinnell speed work on San Bernardino Flood Control

with 6 **TOURNAPULLS**



High-speed, big-tire flotation and grade-climbing ability help meet high- ball schedule on Lytle-Cajon Levee.

Winston-Utah-Vinnell used 6 Tournapulls to speed production on construction of catch basin, levees and groins on Lytle and Cajon Creeks above San Bernardino, California*. This rush job for U. S. Engineers is to control dangerous flash floods that have done extensive damage each spring to bridges, highways and railroads.

Tough loading in loose wash sand

Material is wash sand and gravel from creek bed, loose, hard to load. To cut loading time and enable Tournapulls to get into high gear fast, the sand is kept damp.

* A previous advertisement discussed work of 6 additional Tournapulls for Contractor Clyde Wood on another section of this same project.

Hauls, one way, run from 800 to 2500 feet . . . Tournapulls show high-speed cycles throughout the entire haul range.

4500' cycle in 7 minutes

On a 2250' haul from wash bottom to top of levee, each Tournapull averaged a complete cycle of load, haul, spread and return every 7 minutes. This included pulling loaded up a 125' ramp of 20% grade. Rigs operate two shifts, or 16 hours per day, deliver steady, dependable, low-cost operation.

Jobs like this prove Tournapulls' ability to profitably handle both long and short hauls . . . tough materials . . . steep grades. Ask your nearest LeTourneau Distributor to give you facts and figures that show why and how Tournapulls can deliver dirt at lowest-net-cost-per-yard for you too. See him today!

c30



Tournapulls travel along top of levee, which is being
built approx. 25' high to control Lytle-Cajon creeks.



LETOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

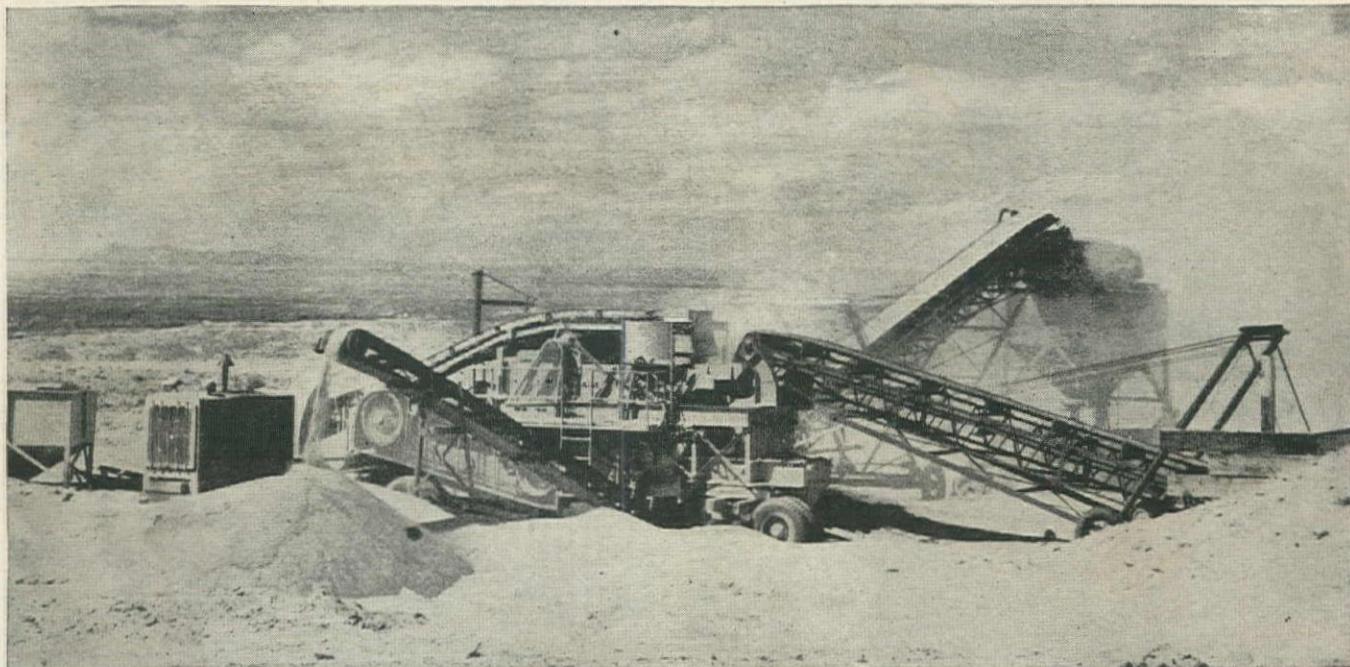


TOURNAPULLS

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

A BIG PLANT FOR THE BIG JOBS

...where low cost is all-important



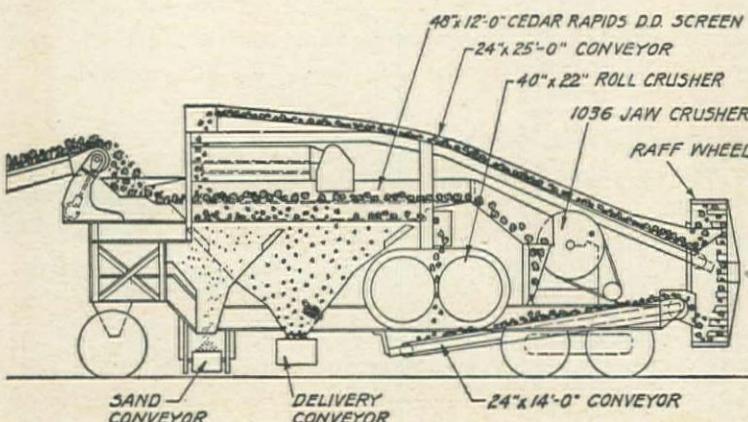
The Cedarapids Master Tandem

"Life Seal" conveyor bearings
require no field lubrication.
Quickly convertible to
quarry plant by adding
portable primary.
No lost time for setting up
and taking down between
jobs. Ask for bulletin MT-1.

HERE'S a portable gravel plant that really lives up to its name—MASTER—master of low-cost operation for your big aggregate producing jobs. It contains all the features that mean big capacity, trouble-free operation and low cost. Horizontal vibrating screen assures greater capacity and closer grading. Large roller bearing jaw and roll crushers have plenty of capacity for smooth operation for every pit condition. V-belt and universal drives eliminate troublesome chains and sprockets. There are dozens of other exclusive features that make the Master Tandem today's most modern, all-purpose crushing plant. Get the facts from your nearest Cedarapids distributor.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.



Cedarapids

Built by
IOWA

THE
IOWA LINE

of Material Handling Equipment distributed by

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

CONTRACTORS Reduce YOUR CLEARING COSTS 50%

NEW!

Just off the press. Eight pages of ideas, suggestions, case histories and actual photographs showing you step by step just how to clear land at a profit. Fill out this coupon and mail it today, sure.

Isaacson KLEARING DOZER *Cuts Clearing Costs*

The Isaacson KLEARING DOZER has been continually improved and perfected so that today it is recognized by farmers and contractors alike as the most effective method of land clearing. It has turned land clearing into a profitable operation.



The Isaacson
KLEARING BLADE
consists of an extra heavy
midboard equipped with
adjustable teeth. When op-
erated on an Isaacson Trac-
Dozer it forms an ideal unit
for clearing, combing and
leveling all types of land.

Please send your free 8 page folder on Land Clearing for Profit — no obligation of course.

NAME _____

ADDRESS _____

CITY AND STATE _____

FIRM _____

ISAACSON

Tractor Equipment

A PRODUCT OF THE ISAACSON IRON WORKS • P. O. BOX 3028 • SEATTLE 14, WASHINGTON

Seven in One the "QUICK-WAY"



"MODEL E"—"QUICK-WAY" TRUCK SHOVEL

As one owner puts it, "Owning a 'QUICK-WAY' Truck Shovel is like owning a yard full of equipment, because the 'QUICK-WAY' is really seven outfits in one."

Pioneered for efficient, profitable operation as a truck shovel, the "QUICK-WAY" is convertible right on the job in less than two hours to any of six other rigs: dragline, crane, trench hoe, clamshell, pile driver, and orange-peel!

All attachments fasten to the universal boom foot; all are designed and built by us for fast, profitable, trouble-free work. No drums to change. All connections are simple, accessible, and easy to make.

Ask for Bulletins

ABILENE, TEXAS—W. T. McClure Machinery Co.
ALBUQUERQUE, N. M.—Hardin and Coggins
AMARILLO, TEX.—Tom W. Carpenter Equipment Co.
ATLANTA, GA.—W. C. Caye & Co.
BATON ROUGE, LA.—Dunham-Pugh Company
BLUEFIELD, W. VA.—Rish Equipment Company
CAMBRIDGE, OHIO—The Major Equipment Co.
CHARLESTON, W. VA.—Rish Equipment Company
CHICAGO, ILL.—Arrow Contractors Equipment Co.
CINCINNATI, O.—Rish Equipment Company
CLARKSBURG, W. VA.—Rish Equipment Company
COLUMBUS, O.—The W. W. Williams Co.
DENVER, COLO.—H. W. Moore Equipment Co.
DES MOINES, IA.—Herman M. Brown Company
EAU CLAIRE, WIS.—Miller, Bradford & Risberg Co.
FARGO, N. D.—North Dakota Metal Culvert Co.
FORT WAYNE, IND.—Korte Brothers, Inc.
FORT WORTH, TEX.—Mr. F. D. Quinn
GREENVILLE, S. C.—Southern Equipment Sales Co.
HOUSTON, TEXAS—Byrd Equipment Exchange
INDIANAPOLIS, IND.—Flesch-Miller Tractor Co.

DISTRIBUTORS

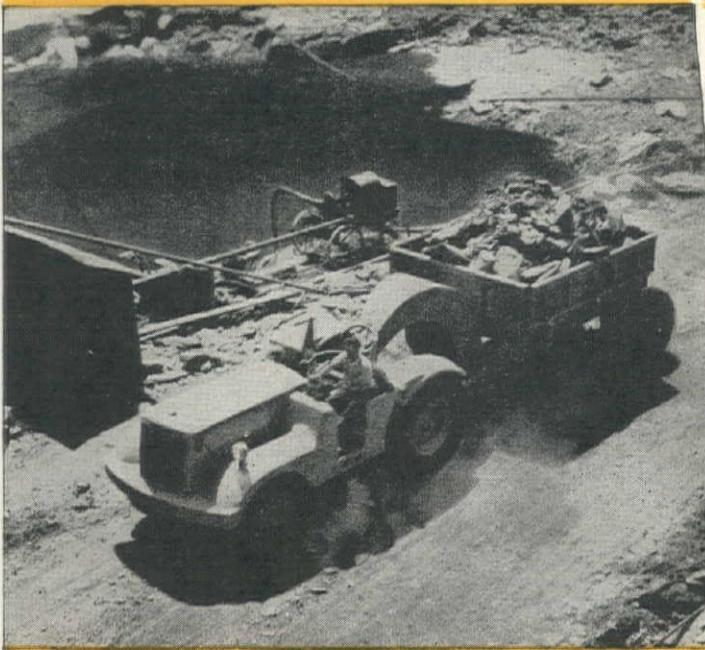
JACKSONVILLE, FLA.—Florida-Georgia Tractor Co.
KANSAS CITY, MO.—The G. W. Van Keppel Co.
LAKELAND, FLA.—Florida-Georgia Tractor Co.
LOS ANGELES, CAL.—Murgaugh Engineering Co.
LOUISVILLE, KY.—Brandeis Machinery & Supply Co.
MACON, MO.—Chas. M. Strong
MEMPHIS, TENN.—Road Builders Equipment Co.
MIAMI, FLA.—Florida-Georgia Tractor Co.
MILWAUKEE, WIS.—Central Engineering Co.
MINNEAPOLIS, MINN.—Rosholt Equipment Co.
MONTGOMERY, ALA.—Ray Brooks Machinery Co.
NASHVILLE, TENN.—Wilson-Weesner-Wilkinson Co.
NEW YORK CITY—N. A. Finn Company
NORTH LITTLE ROCK, ARK.—H. H. Crow
Equipment Company
OAKLAND, CAL.—Buran Equipment Company
OKLAHOMA CITY, OKLA.—Wylie-Stewart
Machinery Co., Inc.

OMAHA, NEB.—T. S. McShane Co.
PORTLAND, ORE.—Nelson Equipment
(Branches)—Seattle, Wash.; Spokane, Wash.;
Boise, Idaho.
RALEIGH, N. C.—North Carolina Equipment Co.
RENO, NEV.—Dennison Tractor and Supply Co.
RICHMOND, VA.—Rish Equipment Company
ROANOKE, VA.—Rish Equipment Co.
ROCHESTER, IND.—Deeds Equipment Company
SALT LAKE CITY, UTAH—Arnold Machinery Co., Inc.
SAN ANTONIO, TEX.—Patten Machinery Co.
SAULT STE. MARIE, MICH.—Straits Engineering Co.
SIOUX FALLS and RAPID CITY, S. D.—
Empire Equipment Co.
ST. LOUIS, MO.—Rozier-Ryan Company
TROY, N. Y.—Howe Brothers
WACO, TEX.—Richards Equipment Co.
WASHINGTON, D. C., and BALTIMORE, MD.—
The Paving Supply and Equipment Co.
WAYCROSS, GA.—Florida-Georgia Tractor Co.
WILKINSBURG, PA.—Arrow Supply Company.

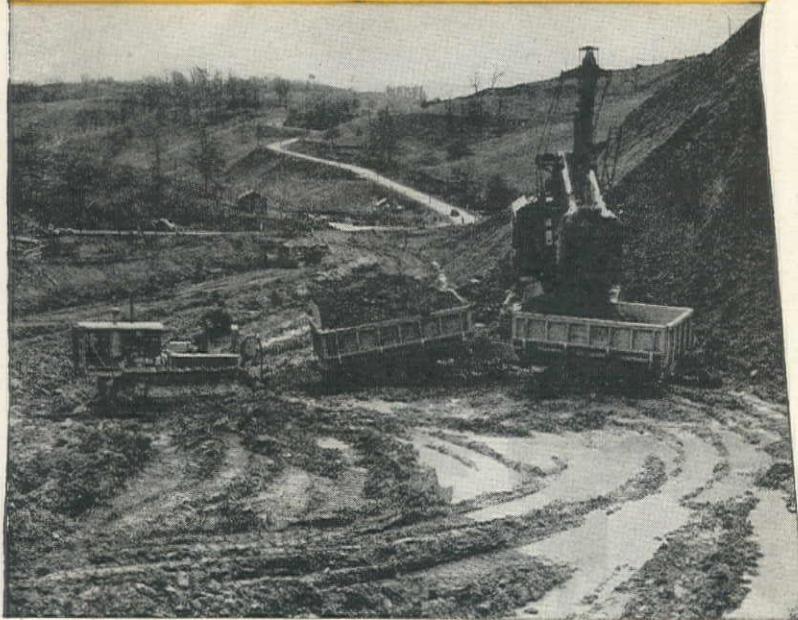
"QUICK-WAY" TRUCK SHOVEL CO., DENVER

GEO. L. MEFFLEY & CO., Sales Representative, 820 University Bldg., Denver 2, Colo.

Rubber-Tired for **HIGH-SPEED HAULING**

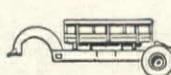


Forged-Trak Wheels for **ADVERSE FOOTING**



HAULING EQUIPMENT to meet job needs—that's the Athey story in a nutshell. For long, high-speed hauls, there's the 10 yard, 2-Way Dump Athey PD-10 Rubber-Tired Trailer, built to match the speed and capacity of the DW10 Tractor. For rough going and adverse weather, there's the complete line of rugged Athey Forged-Trak Trailers that keep your toughest jobs going on schedule. It's tracks or rubber with proven Athey products—machines to fit job requirements for lowest costs, biggest profits. Check with your Athey-“Caterpillar” Dealer before you buy *any* hauling equipment—be sure it is custom-selected for your hauling needs. See him today!

ATHEY PRODUCTS CORPORATION, CHICAGO 38, ILL.



All-Job Hauling Units



Athey

**DEPENDABLE LOADING
& HAULING EQUIPMENT**

These Dealers Serve
Your Territory

ANDREWS
EQUIPMENT SERVICE
404 N. W. Broadway
Portland 9, Oregon

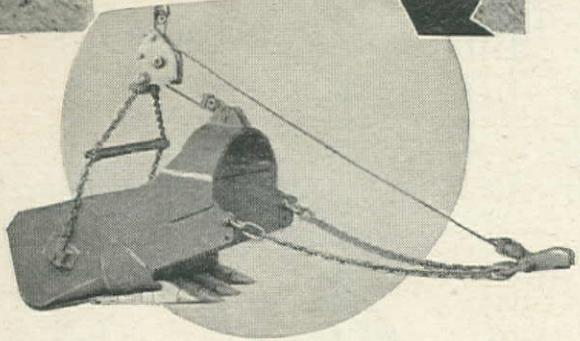
ANDREWS
EQUIPMENT SERVICE
126 South Walnut Street
Spokane 9, Washington

CHOGUILL
TRACTOR CO., INC.
1748 Grand Avenue
Phoenix, Arizona

H. H. NIELSEN COMPANY
212 Beason Building
Salt Lake City 1, Utah

SERVICE EQUIPMENT CO.
300 Aurora Avenue
Seattle 9, Washington

SHAW SALES AND
SERVICE CO.
5100 Anaheim-Telegraph Rd.
Los Angeles 22, California



The Insley dragline bucket illustrated above (standard on the Insley Excavator) can be used with any make of machine. Exceptionally well balanced and counterweighted, the bucket fills readily and discharges quickly. Its rugged, all-welded construction permits easier passage than old rivet and bolt types. Tooth points are detachable and replaceable. Sizes: $\frac{3}{8}$ and $\frac{1}{2}$ -yd.

Proved...
for LOW COST
YARDAGE



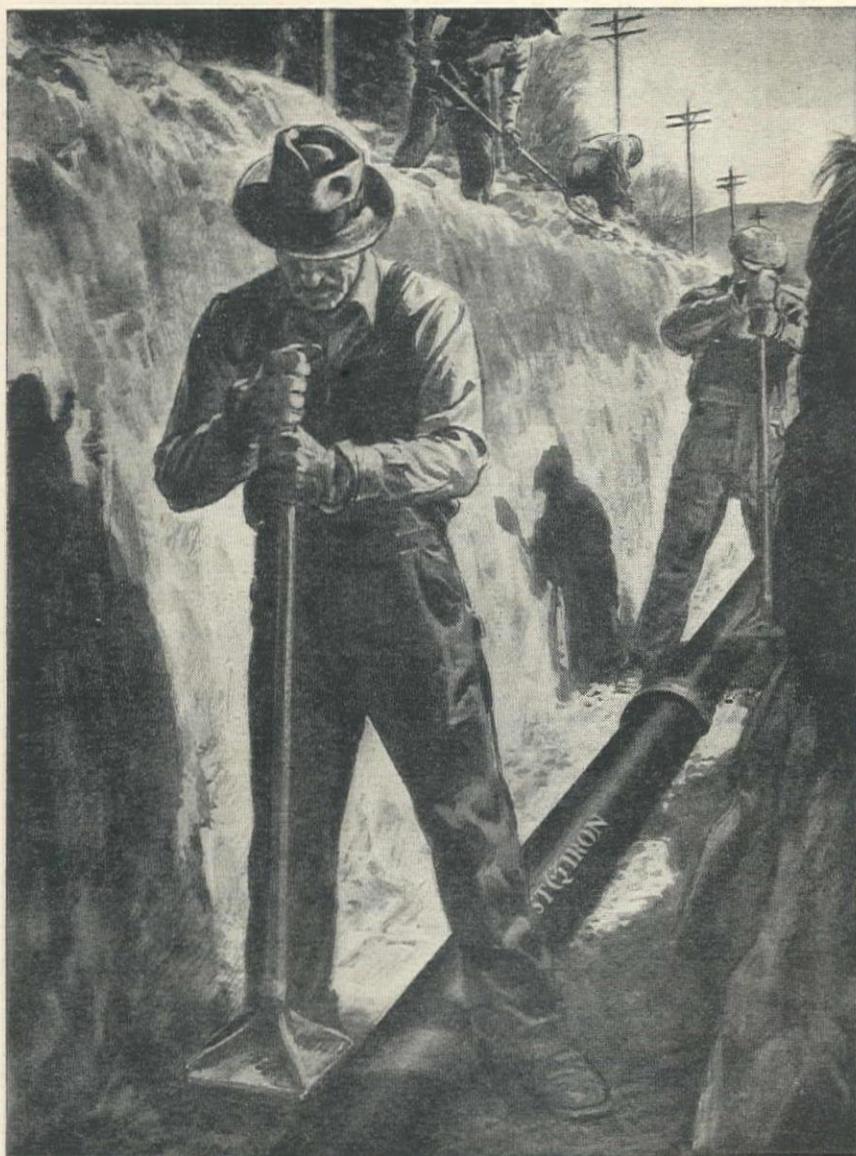
The Insley Excavator features which mean low-cost yardage for the Insley owner are *proved* features . . . proved by contractors on tough jobs the nation over.

Take the Insley Dragline. It has a high line speed and fast swing speed . . . all-welded lattice-boom with a wide boom-foot . . . fairlead mounted on main frame to permit close drag-in. In addition, the Insley Dragline has those proved features common to all Insley Excavators—wide, individually controlled, self-cleaning crawlers . . . hook roller construction . . . live boom hoist—to name only a few.

For an excavator that has *proved* rugged and dependable . . . proved that it can take the tight spots and tough going in its stride, ask your dealer to show you a new $\frac{3}{8}$ or $\frac{1}{2}$ -yd. Insley Excavator in action. Available with five interchangeable attachments—shovel, crane, hoe, clamshell or dragline.



INSLEY MANUFACTURING CORP., INDIANAPOLIS 6, IND.



A cast iron main, properly laid, comes as close to permanent construction as can be predicted in a changing world. Since its useful life is measured by centuries it need never be replaced except as a larger main is

required by population growth, and need never be abandoned should the line be re-routed because of shifting population. It will serve out its full span in the original location or elsewhere. And when it is just settling down to the prime of life, any bonds issued to pay for the installation will have long since been retired and forgotten.



CAST IRON PIPE RESEARCH ASSOCIATION, T. F. WOLFE, ENGINEER, 122 S. MICHIGAN AVE., CHICAGO 3

**CAST IRON PIPE
SERVES FOR CENTURIES**

NOW AVAILABLE!
GOVERNMENT SURPLUS
METALS
FOR IMMEDIATE DELIVERY

THE Western Regional offices of the War Assets Corporation have joined together in a cooperative sales offering of ferrous and non-ferrous metals. If items you seek are not listed, you may be able to obtain them through the nearest War Assets Corporation office.

COPPER TUBING

Hard or soft drawn seamless, in coils or various straight lengths (crated). Various diameters and thicknesses.

ALUMINUM

Sheets and tubing in various sizes, thicknesses and specifications (San Francisco). Bars, rods, tubing and extrusions, (Los Angeles).

BRASS

Brass pipe, Grade A seamless in 12 to 16 foot random lengths $\frac{1}{2}$ " to 5" diameters.

PIPE

Small inventories of: cast iron and steel pipe in various sizes; fittings including reduction couplings, tees and elbows; well casing; lap-weld and galvanized pipe; and steel tubing.

VALVES

A broad range of valves in various sizes and materials including wedge gate, swing, check, float, globe and plug, with wheel, wrench or hydraulic control.

CABLE - WIRE ROPE

Choice selection of cable in various sizes (with hemp or fibre core) including guy-wire type galvanized or tinned. Also heavier cables with serration, suitable for bonding, guying, guard rails, etc.

LEAD BASE ALLOYS

Limited inventories of babbitt and solder. Determine availability through nearest W.A.C. office.

STEEL

PLATES

Sheared or milled plates in wide range of sizes carried in most W.A.C. western inventories.

SHEETS

Limited supply in scattered locations (broken lines). Hot rolled alloy sheets (SAE 9130) from 7 to 14 ga. varied widths from 29" to 70" and lengths from 86" to 168", available from San Francisco inventory.

BAR

Good supply carbon square, and octagon in varying lengths and diameters.

Production bars, round mild steel in 20 foot lengths, available at Spokane or apply to nearest agency.

STRIP

Varying thicknesses and widths (in rolls and flat).

STRUCTURALS

Broad inventory in various dimensions and specifications.

MILL STOCK

Various sizes and analyses, available at Salt Lake City.

*Items offered subject to prior sale or withdrawal.
Buying preference to Veterans of World War II.*

WESTERN OFFICES: Boston Building, DENVER. Alpine 0415 • Power Block, HELENA, Phone 481 • 215 West 5th St., LOS ANGELES, Michigan 6321 • Pittock Block, PORTLAND, ATwater 6401 • Dooly Bldg., SALT LAKE CITY, 5-7503 • Dexter Horton Bldg., SEATTLE, Main 1080 • Columbia Bldg., SPOKANE, Main 5111

WAR ASSETS CORPORATION

A subsidiary of Reconstruction Finance Corporation

HYSTER

Rugged TRACTOR EQUIPMENT for your "CATERPILLAR" TRACK-TYPE TRACTOR

HYSTER tractor equipment is quality all the way through. Sound engineering. Rugged construction. Long life.

Hyster line is made for use with "Caterpillar" track-type tractors. Models include winches, donkeys, yarders, cranes, sulkies, logging arches.

Hyster Company has specialized in "Caterpillar" equipment for 16 years and is the world's largest maker of tractor winches.

The proving ground for Hyster equipment—as for "Caterpillars" — has been the tough towing, lifting and moving jobs around the globe. Long experience with the requirements of construction men in every country accounts for the heavy-duty service of the "Caterpillar"- Hyster combination.

Hyster tractor equipment is sold and serviced by more than 300 "Caterpillar" distributors and dealers throughout the world. One of them is near you. Ask him about Hyster models that will help in your work — or write direct for literature.

PIONEERS IN MATERIALS HANDLING EQUIPMENT

HYSTER COMPANY



2951 N.E. CLACKAMAS STREET
PORTLAND 8, OREGON

1851 NORTH ADAMS STREET
PEORIA 1, ILLINOIS

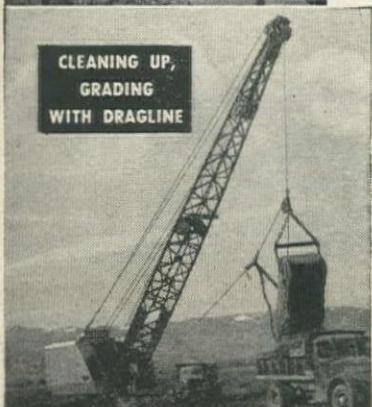
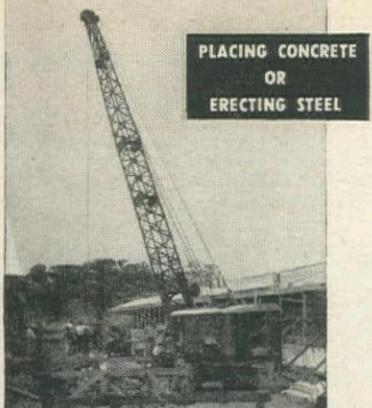
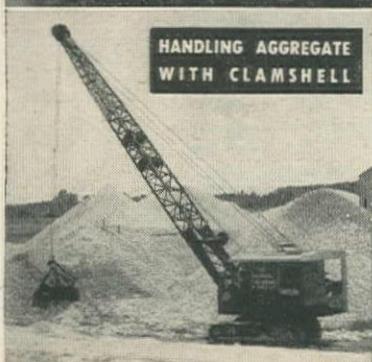


• World's largest manufacturer
of Tractor Winches. Builders of
Hyster Industrial Trucks. Service
Offices in principal world cities.

Extra power...extra pull."Caterpillar" D7 equipped with a Hyster double drum Tractor Donkey.



First to Last it's LINK-BELT SPEEDER!



BEGIN—CARRY ON— WIND UP THE JOB— WITH ONE CONVERTIBLE LINK-BELT SPEEDER

Moving or removing earth, rock, aggregate, or any similar material, is easily, efficiently, economically done, with a LINK-BELT SPEEDER "Shovel-Crane." Ample power supply, easy, precision controls and high maneuverability make these machines favorites with the operators; their economy of operation and upkeep, plus their wide range of application, rate them as top-grade profit-makers.

For Prompt, Efficient, Convenient Sales and Service:
There is a Link-Belt Speeder Distributor Located Near You

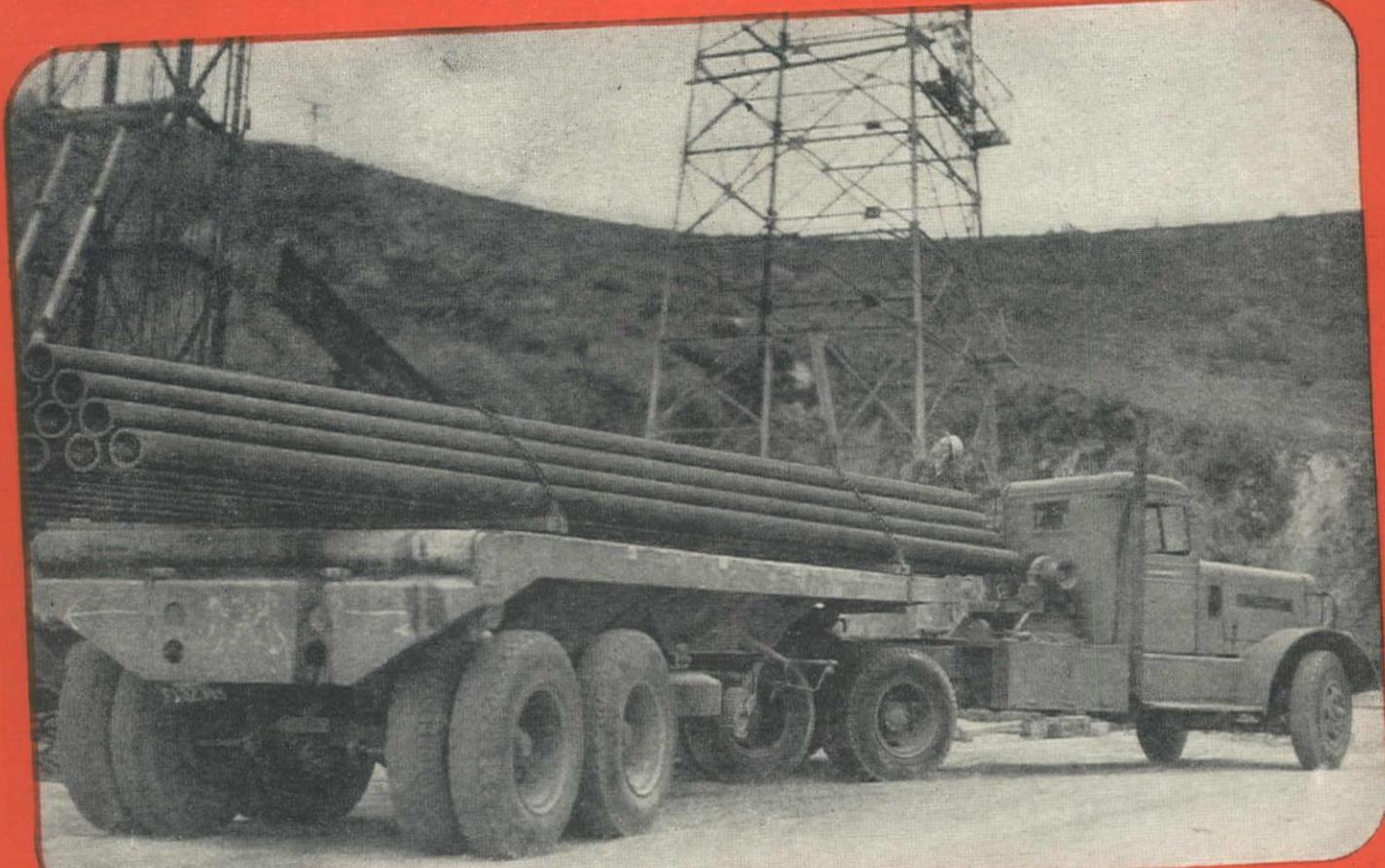
10,223

LINK-BELT SPEEDER

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

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

TOPS IN OIL!



Nature wasn't always considerate in placing her oil deposits in California. Some are right along paved highways. Others right on the waterfront. Much of the remaining is up in the mountains where transportation of materials is over rugged mountain terrain, with steep grades, dirt roads, hairpin turns. Just the kind of conditions which permit PETERBILT TRUCKS to make production models look like toys. Tide Water Associated Oil Company bought a couple of Diesel powered PETERBILTS for heavy hauling in their fields in the mountains back of Ventura and at Santa Fe Springs. Their performance was so eminently satisfactory that they followed with an order for two more PETERBILTS. If it's big stuff—machinery, drill pipe, casing, cement—it's put on the PETERBILTS. They can be depended upon to get it where it's intended to go.

Peterbilt Motors Company

107th AVENUE AND MacARTHUR BOULEVARD · OAKLAND · CALIFORNIA



WE HONOR THE WEARERS OF THIS EMBLEM

Wearers of the service emblem, you have proved to the world that Americans with American-made machines could not be defeated. Many of you have used LIMA cranes, shovels and draglines to build air strips and bridges; to load and unload ships; to remove debris from bombed areas and countless other jobs important in winning the war. You have seen the efficiency of LIMA machines under trying conditions, how their

smoothness of operation, ease of control and fast operating speeds step up the tempo of the job. To the veterans, who will continue to serve America in peacetime construction, LIMA offers the same high quality shovels, cranes and draglines which served so well in war. LIMA shovels are made in sizes ranging from $\frac{3}{4}$ yard to 5 yards capacity, crane sizes range from 13 tons to 100 tons. Write for bulletins.

LIMA LOCOMOTIVE WORKS, INCORPORATED
SHOVEL AND CRANE DIVISION

NEWARK, N. J.

DALLAS, TEXAS

MEMPHIS, TENN.

SEATTLE, WASH.

LIMA, OHIO

SAN FRANCISCO, CALIF.

SPOKANE, WASH.

LOS ANGELES, CALIF.

ST. LOUIS, MO.

PORTLAND, OREGON

LIMA

SHOVELS - CRANES - DRAGLINES

Our Seattle Office, 1932 First Avenue South; Portland, Fenaughty Machinery Co., 112 S. E. Belmont St.; Boise, 600 Front St.; San Francisco, Garfield & Co., 1232 Hearst Blvd.; Los Angeles, Smith Booth Usher Co., 2001 Santa Fe Avenue; Denver, Held & McCoy Machinery Co., 3201 Brighton Blvd.; Phoenix, Smith Booth Usher Co., 1756 Grand Avenue; Contractors' Equipment and Supply Co., Springer Bldg., P. O. Box 456, Albuquerque, New Mexico; and Modern Machinery Co., Inc., N. 2417 Division St., Spokane 2, Washington.

Capacities

SHOVELS

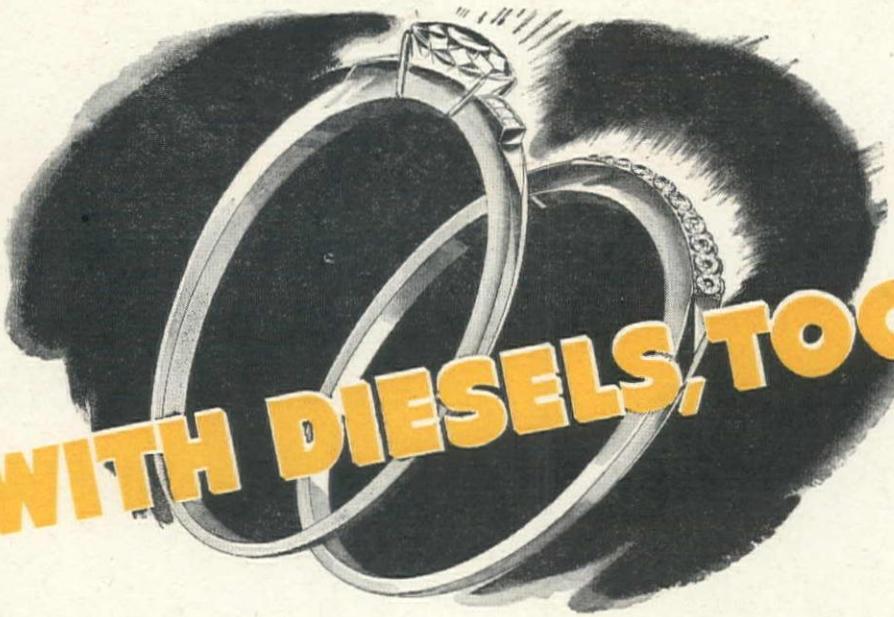
$\frac{3}{4}$ Yd. to 5 Yds.

CRANES

13 Tons to 100 Tons

DRAGLINES

Variable



WITH DIESELS, TOO

It's the COMBINATION that counts

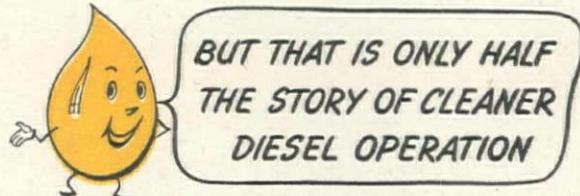
**Improved Diesel performance is possible...
but only if the fuel and the lubricant work
together for cleaner operation**

WHEN YOU BUY Shell Dieseline, you get a fuel that is 100 per cent distilled. Pre-determined fractions of selected crude oil, desirable for Diesel use, have been distilled off into storage tanks. Impurities and undesirable fractions are left behind.

These distillates are then carefully blended to exacting specifications which have proven satisfactory in actual operation.

Furthermore, the viscosity of Shell Dieseline is controlled so that you get the correct viscosity to lubricate pumps and injectors, but not so heavy as to affect proper atomization through injector nozzles.

Then, to make doubly sure Shell Dieseline burns cleanly, Shell delivers it in clean tank cars or trucks, so the fuel reaches you in prime condition for quick, clean combustion.



Keeping the engine from sludging is a job for the lube oil. And Shell Talpex Oil is two-way fortified to do that job.

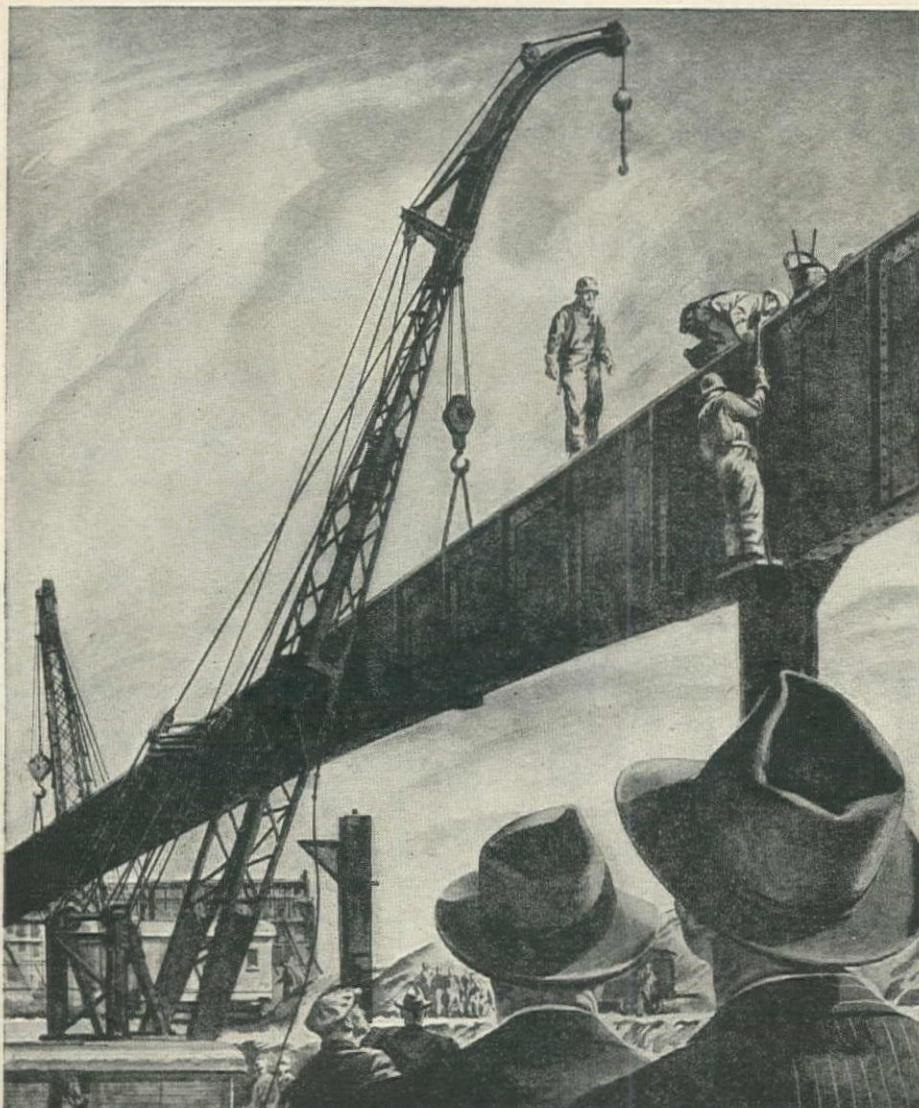
First, Shell takes out, during the refining of Talpex, all components that readily oxidize. Then an oxidation inhibitor and a detergent are added. The result is a lubricant that keeps rings, valves and ports cleaner...makes your engine last longer.

To get maximum efficiency out of your Diesel, use the combination of Shell Dieseline and Shell Talpex Oil. Your Shell man can supply you.

SHELL DIESEL FUELS and LUBRICANTS

Shell engineered for the job





Here's a show that scores a hit wherever it plays—building erection. These big cranes pick up steel girders and mesh them into place like the gears in your car. The star in the cab does it with levers and Preformed wire rope.

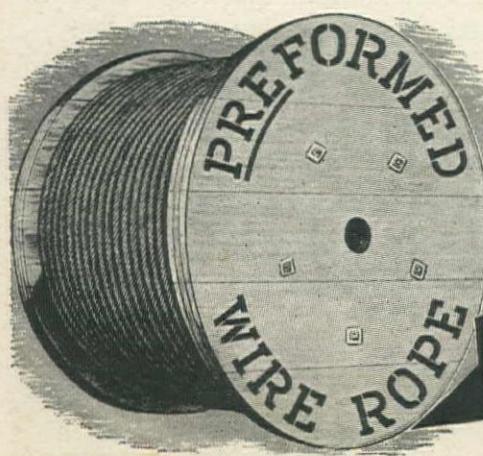


Logging machinery moves dead-weight logs with wire rope providing the sinews. Preformed wire rope gets top billing because it handles easier, resists kinking and stands the gaff.

If you're a
"Sidewalk
Superintendent"
-watch the
wire rope



Earth moving has come a long way since the day of the pick, shovel and wheelbarrow. Now bulldozers, shovels and trench hoes make the dirt fly—and their moving parts are actuated by wire rope, Preformed preferred.



On jobs like these and hundreds of others the new wire rope—Preformed—is breaking old performance records. Operators like it because it's safer and handles easier. The office likes it because it lasts longer and reduces time lost for replacement. It makes money by saving money.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

IT HANDLES EASIER—LASTS LONGER

Two more Macks were recently added to the dump-truck fleet of the Bay Construction Company, Seattle, Washington. That makes 14 of them now on the tough jobs for Bay! Like so many successful operators of heavy-duty trucks—Bay Construction has learned that you can't beat Macks for on-the-job performance!

They wanted Workers, so

Macks are built to give you *extra work for your money*—that's the reason for *extra features* like tetrapod instead of conventional gears—rubber shock insulators instead of ordinary spring shackles—special heat-treated, steel alloys—and case-hardened, generator-ground timing gears which have never had to be replaced because of wear.

When you build a truck this way its price must be a bit higher—but its cost to its owner is a lot less in the long run. A Mack pays off in work on the job!

...they bought Macks!



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

Mack

TRUCKS

FOR EVERY PURPOSE



*Performance
Counts!*

HORTON ELEVATED WATER STORAGE TANK

*provides water for sprinkler system
at Long Beach, California, Pier No. 1*



ONE of the best formulas for protecting property and human lives from fire is an automatic sprinkler system plus gravity water pressure. The City of Long Beach, California, uses this type of fire protection for its Pier No. 1 in the Cerritos Channel as shown in the views on this page. This pier is adjacent to Pier No. 2 which suffered a disastrous fire recently.

Many manufacturing plants depend on Horton elevated storage tanks to provide a gravity water pressure to operate automatic fire protection systems. These tanks are built to meet the requirements of insurance rating organizations and the engineering and inspection departments of insurance companies. In addition to protecting property from fire, elevated storage and an automatic sprinkler system will usually reduce the insurance premium

rate on the property covered. A recent report shows that the Memphis Compress Company at Memphis, Texas lowered its insurance rate 70% by installing automatic sprinkler service and a 100,000-gal. Horton Elevated Water Tank.

Most automatic sprinkler installations require an elevated storage tank of from 50,000 to 250,000 gals. capacity. We also build elevated steel tanks in capacities from 5,000 to 2,000,000 gals. for general water supply and municipal service. Write our nearest office for quotations on Horton elevated water storage tanks, stating capacity, height to bottom and location.

CHICAGO BRIDGE & IRON COMPANY

SAN FRANCISCO • ATLANTA • BIRMINGHAM
CHICAGO • HOUSTON • NEW YORK

Plants at BIRMINGHAM, CHICAGO,



PHILADELPHIA • DETROIT • WASHINGTON
CLEVELAND • TULSA • LOS ANGELES
and GREENVILLE, PENNSYLVANIA

WESTERN CONSTRUCTION NEWS

March, 1946

WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Vol. 21, No. 3

J. M. SERVER, JR. Editor
T. D. OVERTON Managing Editor
ARNOLD KRUCKMAN Associate Editor
A. H. GRAHAM Field Editor

A New Interior

THE NATION has been blessed during the last month by the long-overdue departure of Harold Ickes from the post of Secretary of Interior. (May he rest in peace—but we'll venture he won't!) It has been doubly blessed by the appointment of an honest and capable man to replace the old curmudgeon.

The appointment of J. A. (Cap) Krug was utterly unexpected (for Washington reactions and judgments, read the late wire with Arnold Kruckman's letter on page 117) and was so much superior to other recent presidential appointments that one is truly gratified. Krug comes from a background of service with TVA, but demonstrated that he would be utterly fair in dealing with industry in general and private power people especially during his term of office with WPB. He has never been particularly identified with any political party. He is naturally a liberal in his thinking, which is a fine thing in any man, provided he combines that with honesty, which has been notably rare. In the case of Cap Krug, these two virtues are combined, and we join the rest of the nation in congratulating Mr. Krug and anticipating a new era of accomplishment in the activities of the Department.

The Seat of Deceit

WE'RE HAPPY TO REPORT that San Francisco has at last been dropped as a potential site for the headquarters of the United Nations Organization, or as it might more properly be termed, "The Seat of Deceit."

In the first place, the extraterritorial area demanded by the European diplomats would take more than is under any consideration available in the crowded San Francisco region, and furthermore, the homes and other edifices which would have to be cleared to make room for the architectural monuments planned to house the halls of dispute would only aggravate shortages already acute.

And Westerners, accustomed to the freedom of the "wide open spaces," would not react well, we fear, to finding a large area of what they had always considered their own country patrolled by European or Asiatic soldiers who could deny them admission or passage. Of course, a similar reaction to this is already being heard in New York and Connecticut, where the UNO commissioners have chosen a site without reference to the present inhabitants.

But by far the least desirable part of having the UNO in your backyard is the aura of hatred, suspicion, discord, and eventual failure which is certain to surround the supernational state. The disruptive actions of Russia, particularly, but plenty of other nations, too, at the recent London sessions of UNO presage a short life and an ineffectual one for the organization. It just wouldn't be healthy to be near.

There would, of course, be a terrific amount of construction required, and we regret the loss of this juicy plum for our contractor friends, but there is already a sufficient backlog of work in the West to keep them occupied for years to come, and the natural inevitable growth of the West will increase their opportunities. The disadvantages of having a new national entity (even if it be called a super-nation) set down in our midst far outweighs the advantages of temporal character which would for a time accrue.

Why Waste the Water?

THE CONTENTION of certain of the Bureau of Reclamation leadership that the Southern San Joaquin people should not expect the Friant-Kern canal to be pushed over-energetically so that the canal can be ready to carry water before all the Central Valley Project is ready to be put in full operation may pose a question. Water out of Friant dam is currently wasting to the sea. If that waste water is turned into a completed canal before pumping units farther up the project to the north are raising the supplemental supply, at least a great part of now wasted water can be salvaged to bring some relief to the lower valley. Is it not reasonable to suppose that once even a portion of the Friant-Kern canal's potential capacity is being utilized that water agreements can more speedily be negotiated? In the same sense, the cheap power doctrine which is currently being brought into the valley picture as a political lever, can then be discussed and studied with less emotion than is now necessary to inject into arguments. These emotional arguments stimulate quick judgments, which in turn are calculated to aid a campaign to build a federal power monopoly in Washington. —Southern San Joaquin Valley Flood Control Association.

To Have and Have Not

DURING THE FURIOUS debate at the Denver meeting of the National Reclamation Association, discussed in our December issue, on the subject of limitation of land use on federally-irrigated projects to 160 acres, the statement was several times made that it is hard to convince established farmers in the East, already doing a good business, that money should be appropriated to irrigate more land in the West, upon which will be established more farms, which eventually may be in competition with themselves. This dog-in-the-manger attitude is certainly understandable, if not entirely justified. We don't like it, for we seek the money.

However, one noticed, creeping around the edges of the Denver convention, some evidences of a similar attitude in the West itself. Representatives of already irrigated regions, upon which farms are established, are commencing to wonder whether it is necessary to irrigate much more land, where new farms might be in competition with themselves! Human nature is pretty much the same, East and West—ME FIRST!

On Time Now

THE WAR IS OVER! In common with every other magazine in the country, *Western Construction News* was beset with innumerable handicaps to efficient production during the period of the war. Manpower shortages in every field were most painfully felt; government censorship made it extremely difficult to secure or to adequately discuss many construction projects; transportation difficulties made us reduce our field coverage; paper shortages made necessary the use of lighter weight and lower grade paper; overloaded mails slowed deliveries so that it often took two weeks after issue to reach the subscriber.

But now the war is over—The February issue was in the mails on the 15th, as per schedule. Starting with this issue, the readers will receive a 5-day better break in timeliness of coverage. Henceforth the magazine will be in the mails on the 10th of each month. Production facilities have been corrected so that it is not anticipated there will in future ever be any reason why this date cannot be met. We cannot be responsible for the delivery time of the postoffice, but we understand this, too, is being gradually speeded up. Always the best news—now sooner!

IN 1946 FOR THE 9th CONSECUTIVE YEAR



—no Motor Grader without All-Wheel Drive and All-Wheel Steer will be able to match the all-around performance of the "99-M" Power Grader.

Primary and secondary roads took a terrific beating during the war years. Hundreds of thousands of miles are in desperate need of maintenance; other thousands of miles are almost equally in need of widening and resurfacing. No single machine can perform *so many* of these jobs *so well* as the "99-M."

AUSTIN-WESTERN COMPANY • AURORA, ILLINOIS



ARIZONA—SMITH BOOTH USHER COMPANY Phoenix
CALIFORNIA—EDWARD R. BACON COMPANY . . . San Francisco 10
SMITH BOOTH USHER COMPANY . . . Los Angeles 54
COLORADO—LIBERTY TRUCKS & PARTS CO. Denver 1
MONTANA—WESTERN CONSTRUCTION EQUIPMENT COMPANY . Billings
WESTERN CONSTRUCTION EQUIPMENT COMPANY . Missoula

NEVADA—C. D. ROEDER EQUIPMENT CO. Reno
NEW MEXICO—WESTERN STATES WELDING & PRESS CO. . Albuquerque
OREGON—COLUMBIA EQUIPMENT COMPANY Portland 14
UTAH—WESTERN MACHINERY COMPANY Salt Lake City 13
WASHINGTON—COLUMBIA EQUIPMENT COMPANY Seattle
WYOMING—WILSON EQUIPMENT AND SUPPLY CO. . . . Cheyenne

MARCH • 1946

Oregon Highway Modernized



EARTH-MOVING EQUIPMENT backfilling with rock around a culvert and one of the typical embankment stabilization trenches for a big fill on the Grave Creek-Wolf Creek highway project, which involves over 866,000 cu. yd. of excavation.

Southern Oregon highway bottleneck being eliminated by construction of modern 24-ft. roadway, which reduces total curvature from 4,218 deg. to 480, and number of curves from 100 to 10 — Project is characterized by heavy excavation and improved embankment stabilization procedure

SOUTHERN OREGON'S dream of a modern north-south highway was one step nearer when, on May 15, 1945, the Oregon State Highway Commission awarded to McNutt Bros. of Eugene, a contract for the reconstruction of the Grave Creek-Coyote Creek Section which involved the expenditure of \$660,000 for grading and surfacing 4.4 mi. of the Pacific Highway.

The project, located 18 mi. north of Grants Pass, extends from Grave Creek northward over a summit and down into Coyote Creek. It is a continuation of the State Highway Commission's program of modernizing the entire Pacific

By K. D. LYTHE

Division Engineer

Oregon State Highway Department
Roseburg, Oregon

Highway from the Washington State Line to the California State Line.

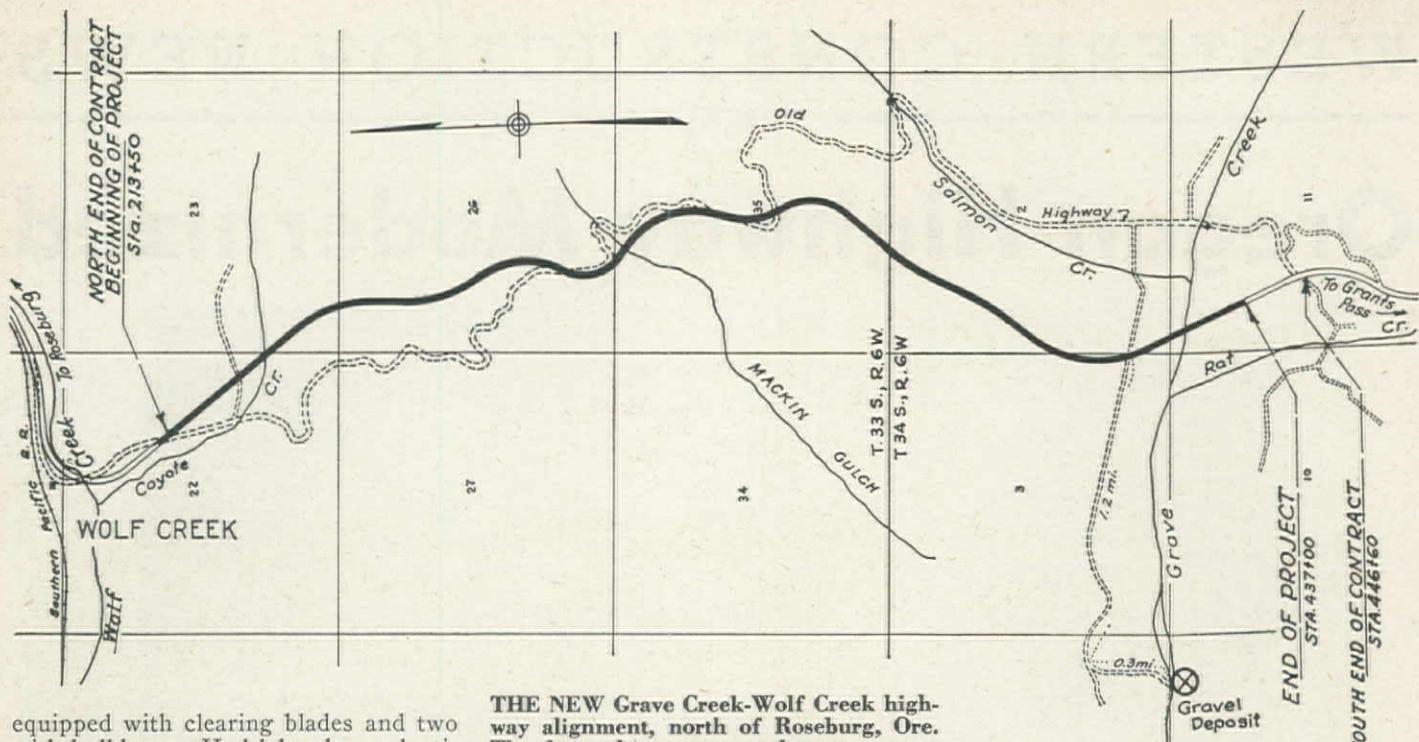
The existing highway was built in 1923. The alignment is very crooked, with nearly a hundred curves, having a total of 4,218 deg. of central angle. The new road is designed in accordance with modern standards. There are only ten curves, the maximum being an eight degree, with the central angle reduced to

480 deg. The bituminous macadam, a three-inch penetration type job, will be 24 ft. wide with crushed gravel shoulders nine feet on each side. The work involves the excavation of 866,000 cu. yd. of material, the construction of two reinforced concrete bridges, four reinforced box culverts and the surfacing and construction of the bituminous macadam.

Clearing right-of-way

McNutt Bros. started work almost immediately after the awarding of the contract, as little time remained before the fire warden would prohibit burning of timber. The clearing covered an area of seventy acres, all of dense timber on steep side hills. The timber consisted, principally, of fir, oak, and madrona; while none of the trees was large, some had diameters of twenty-four inches.

Labor, such as is generally used in clearing jobs, was non-existent. Since the contractor has previously used tractors for this type of work, it was decided to use them. Six D-8 tractors were brought onto the project—four were



equipped with clearing blades and two with bulldozers. Had labor been plentiful, it would have been less costly to have performed some of the clearing on the steepest slopes by hand. Two men with a small gasoline engine chain-saw felled the larger trees and one and one-half tons of powder were used in blasting the largest stumps. Aside from this help, all of the clearing work, even to going back and chunking up the fires, was performed by the tractors. The smaller trees were knocked down without ado, but the larger ones required a little work on the roots before bowing to the dozers. Whole trees were bucked up into huge piles and burned. Two trucks with 800-gal. water tanks, pumps and hoses stood by during the burning to prevent the fire from spreading to adjacent timber. Despite the dryness, no difficulty was experienced in burning.

As the hillside became steeper towards the summit, there was much discussion by the roadside superintendents as to whether or not the contractor could get the tractors up and down some of the steeper slopes. However, Superintendent Buck Shaefer never gave up and never lost a cat or a driver, although the same could not be said for some of the tractor clutches. The tractor drivers would become frightened when starting down some of the 1½-to-1 slopes and would set the brakes, which was not so good for the clutches.

After the tractors had finished the clearing, they were outfitted with dozers and 15-cu. yd. scrapers which were supplemented, in September, with three 12-cu. yd. scrapers, three Tournapulls with 12-cu. yd. buggies and a 2½-cu. yd. power shovel.

Embankment stabilization

Before any but the smaller excavations and fills could be made, considerable work was necessary in the preparation of the bases of the larger fills, and culverts had to be installed.

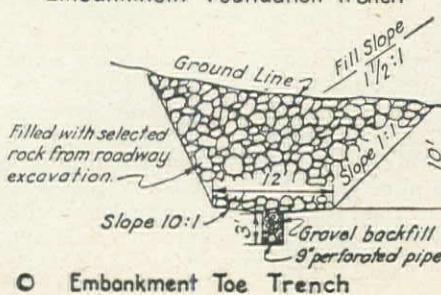
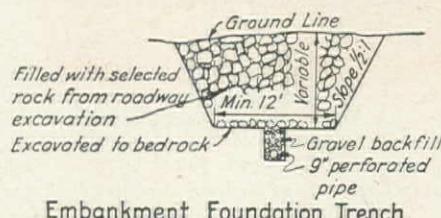
Previous experience with embankment slides in similar country has dem-

THE NEW Grave Creek-Wolf Creek highway alignment, north of Roseburg, Ore. The formerly tortuous and narrow route is being replaced with a modern, 24-ft. biminiuous macadam road, with flat curves.

onstrated the necessity of adequately preparing the foundation upon which these large fills rest. Once the embankments start moving, the work of stopping such slides requires the expenditure of large sums of money, time and patience. Prior to the final preparation of the plans, considerable time was spent in testing the foundations by means of open shafts and drilling. The Department believes it is much easier and less expensive to prevent the slide from developing than to try to stop it after it has started.

This preventive work consists mostly in draining the area and/or removing unsuitable material. At one place on the project, a ditch is being dug sixty feet in depth beneath an embankment; this involves the removal of 22,000 cu. yd. of

ROCK-FILLED drainage trenches used for stabilizing foundation of higher fills on the Oregon highway modernization. Rock excavated on other sections of the project is used for backfilling in the trenches.



material. This sort of work has been successfully used in other locations and is believed to be worth all it costs. As a means of reducing the cost, the ditches are designed so that the contractor can use regular types of earth-moving equipment without importing special machines or having to do the work with hand labor.

Generally, it has been possible to place the concrete box culverts on rock even though it entailed the excavation of a considerable amount of material and added to the culvert length; if so placed, they are less likely to pull apart if sliding takes place in the fill, but past experience has shown that they can still be pulled apart. The concrete box culverts are placed wherever the fill on the centerline is over forty feet, even though smaller culverts would have afforded sufficient waterway to care for the drainage.

While the general plan of the earth-work distribution is shown on the profile, the contract provides that the engineer shall, at all times, have the right to order specific kinds of material to be placed in specific parts of the embankment. In line with this plan, the poorer, less stable soils are used in the shallow fills or placed in thin layers on alternate layers of rock or more stable soils. Material from rock excavation is used where possible on the bottom two feet of the embankments and in the backfilling of the drainage trenches which are beneath the embankments.

The work of preparing the embankment foundations, constructing the box culverts, one of which had a length of 430 ft., and the necessity of stripping some of the cuts, and leaving others for use in certain parts of the work, has slowed the contractor's progress to some extent and has placed a definite premium on good planning.

Surfacing material

In order to reduce the surfacing quan-

tities, it has been provided that the top eighteen inches of the entire grade, fifty feet wide, is to be made of rock taken from the roadbed excavations or of gravel taken from a channel change which is being made in Grave Creek. The gravel is to be used on about one and one-half miles of the grade and two and nine-tenths miles are to be covered with rock. Such procedure provides an excellent foundation. It is practical and economical to construct. While the rock cannot be placed in layers of much less than eighteen inches, it has been found that with a small amount of selecting and a skillfully operated bulldozer, a smooth surface can be secured. A tolerance of two-tenths of a foot in grade is easily met.

By this means it is possible to increase the thickness of the sub-base to a point where it is adequate for any foreseeable highway load. The cost is substantially less than it would be for any other type of surfacing having a comparable strength. It reduces to a minimum the amount of crushed rock or gravel necessary. Based on past experience, it has been found that rock having a high abrasion test can be used. When rock or gravel sub-base has been placed, it can, if necessary, be keyed with $\frac{3}{4}$ -0-in. crushed gravel. After being keyed, a smoothing or leveling course of 3-0-in. crushed gravel three inches in thickness will be placed and this material will be covered with $1\frac{1}{2}$ in. of $\frac{3}{4}$ -0-in. crushed gravel. This will complete the rock surfacing. It will be $22\frac{1}{2}$ in. thick and will be covered with a wearing surface of

three-inch penetration type bituminous macadam, Oregon Type B-11.

Source of gravel

The gravel used in the crushed gravel surfacing will be obtained from an immense pile of tailings left by a dredge which mined gold in Grave Creek, one and one-half miles west of the south end of the project. The gravel has all been screened and practically all of the material below an inch has been taken out. The gravel particles range in size from an inch in diameter up to small boulders.

In order to secure a well-crushed product for the gravel surfacing, the contractor is required to screen out all gravel which will pass through a one-

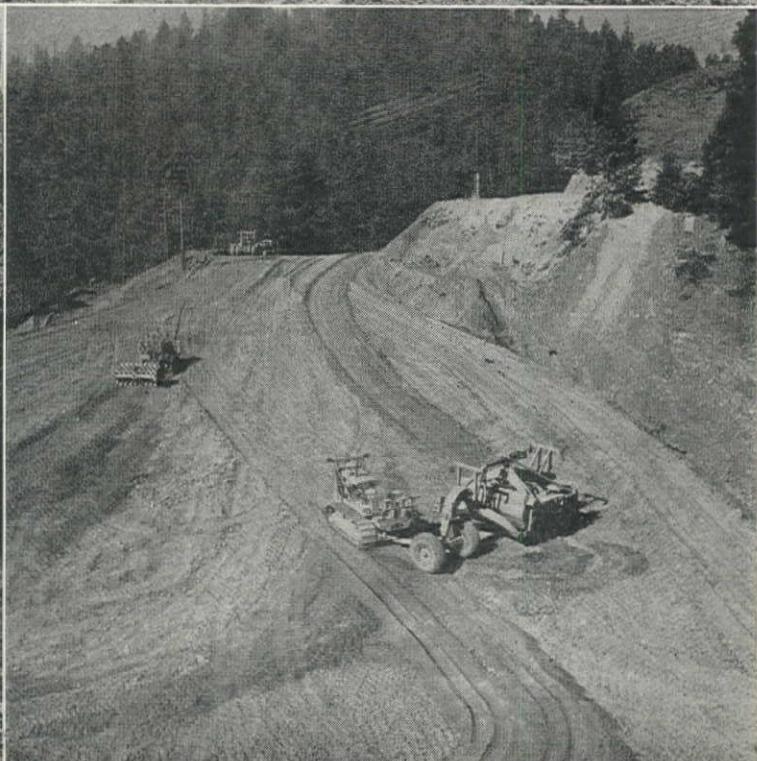
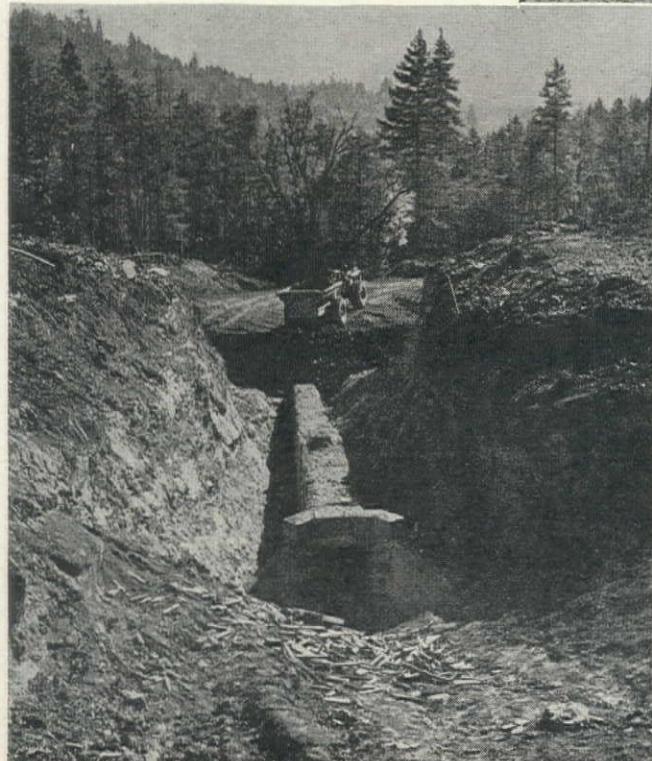
inch square screen. The material used in the manufacture of the 2-0-in. crushed rock must then have at least forty per cent which will be retained on a three-inch screen, and after crushing, it must contain at least 35 per cent, but not more than 50 per cent which will pass through a $\frac{1}{4}$ -in. screen. The $\frac{3}{4}$ -0-in. material must contain at least 45 per cent, but no more than 60 per cent, which will pass the $\frac{1}{4}$ -in. screen.

Bituminous surfacing

The aggregates to be used in the construction of the bituminous macadam surface will also be manufactured from gravel. In order to secure well-crushed materials, the gravel from which the



EMBANKMENT CONSTRUCTION on the Roseburg highway section. Below, rock backfilling over a culvert. Weepholes in culvert take care of side drainage. The other pictures show heavy equipment depositing and rolling embankment fills. In the upper picture, the equipment is filling over one of culverts, bottom on sidehill.



EQUIPMENT WORKING about $1\frac{1}{2}$ mi. north of south end of project. This is typical rock from cuts, which is used as backfill around the fill stabilization culverts.

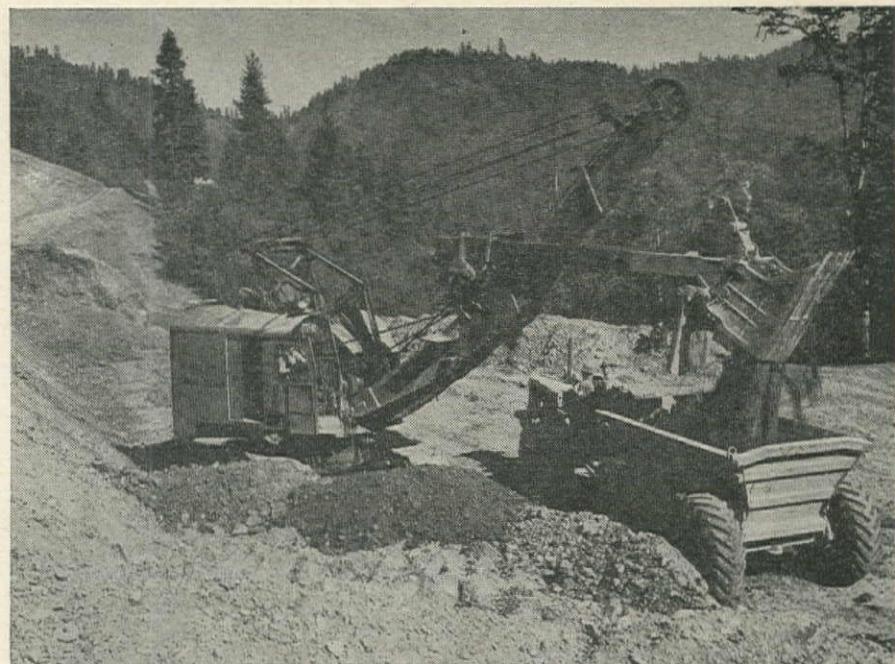
aggregates are manufactured must be retained on a circular screen of the sizes indicated below:

Designated Maximum Size of Crushed Gravel	Size of Screen on which Gravel to be Crushed is Retained
2 $\frac{1}{2}$ inch	3 $\frac{1}{2}$ inch
1 $\frac{1}{4}$ inch	2 inch
$\frac{3}{4}$ inch	1 inch
$\frac{1}{2}$ inch	$\frac{3}{4}$ inch
$\frac{1}{4}$ inch	0 inch

The bituminous macadam is to be of the penetration type, three inches in thickness and twenty-four ft. in width. The bituminous cement to be used in all but the final seal will be 120-150 penetration asphalt. RC-3 rapid curing cutback asphalt, or emulsified asphalt, as the contractor may elect, will be used in the final seal coat.

Progress

At the time this is written, the contractor has moved 450,000 cu. yd. of material, completed the concrete box culverts, and other related grading work, but it is not expected that much more of this type of work will be done until spring. During the winter he expects to



erect his crushing plant and crush most of the 36,000 cu. yd. of material to be used on the project.

The project is being constructed by the Oregon State Highway Commission under a cooperative agreement with the Public Roads Administration. It is clas-

sified as a "Federal Aid Strategic Network Project." R. H. Baldock is the Chief Engineer for the Commission and Glenn E. Roberts is the Resident Engineer on the project. Theo (Buck) Shaefer is general superintendent for McNutt Bros.

Arizona Contractor Starts Work on Largest Concrete Sales Warehouse

ONE OF NUMEROUS new industrial and commercial buildings being constructed in Arizona as a part of an extensive postwar building boom, is a \$450,000 warehouse and merchandising structure being erected in Phoenix by Del E. Webb Construction Co. for General Sales Co. It will be the largest of its type in the state.

It is located adjacent to the tracks of the Southern Pacific Railroad Co. just outside the city limits of Phoenix at the corner of Seventh and Grant Sts. The contract calls for completion by Aug. 1st, and the contractor is carrying work forward at a rapid rate in order to meet the deadline.

The building will be a Class A, fire-

proof structure throughout, and built entirely of reinforced concrete. The steel roof will be supported on steel girders and a full inch of insulation will be superimposed on the roof.

Outside dimensions of the new warehouse are 220 x 300 ft., and there will be 1,603,000 cu. ft. of available space. The building is on a site measuring 305 x 600 ft., thus allowing ample room for future expansion. All that portion of the area not occupied by the building will be paved as a parking and open storage area.

The center section of the building will be two stories in height, and have a 100x 220-ft. basement. In the basement will be housed storage rooms for frozen food

and the necessary refrigeration machinery.

On the main floor will be fruit and vegetable cold storage rooms and the air conditioning units for the entire building, and on the second floor most of the space will be occupied by the general offices of the company and a model grocery store for the benefit of customers.

The main warehouse floor will be laid out so that a continuous towline conveyor system, 1,600 ft. long, can be installed, and movement of stock to any loading or unloading point will be entirely mechanical. Lighting will be by a modern fluorescent system throughout. No windows will be installed except in the offices and the front of the structure.

Included in the exterior features of the building is a loading dock at freight-car and truck-floor level, extending all along one side of the warehouse and around each end. It will have a total length of 600 ft. and a width of 16 ft. A structural canopy will protect the dock from the elements.

The first construction operation undertaken by the company was the pouring of the sidewalls for this dock. The space between was then filled with the material excavated from the basement, thus making unnecessary a second handling. After filling and settling, a concrete floor was poured for the dock.

Superintendent of construction for Del E. Webb Construction Co. is Jack N. McPhee.

This preliminary information about the project was furnished to *Western Construction News* by E. G. Shaver of the Webb company.

REINFORCED CONCRETE warehouse and sales structure being erected at Phoenix by Del E. Webb Construction Co. for General Sales Co., shown in architect's drawing.



Water Conservation— Ventura River Flood Control Plan

Donald R. Warren Co. conducts thorough investigation of Ventura County's flood control and water conservation problems, involving four principal river systems, resulting in bonds being passed for a \$3,400,000 Matilija-Coyote project, which includes construction of two dams and a distribution system

A COMPREHENSIVE INVESTIGATION of the problems of conserving the waters of Ventura County, Calif., and controlling floods from its four major river systems was conducted by Donald R. Warren Co. during 1945. The investigation was based upon an engineering analysis of hydrological and other factual information available from published reports, unpublished records and visual reconnaissance. Each project was studied to determine its economic justification under present conditions.

As a result of the investigations, bonds have been passed and construction work will soon begin on a \$3,400,000 project involving two dams and an extensive distribution system.

Ventura County Flood District

By law, the Ventura County Board of Supervisors are the Board of Supervisors of "Ventura County Flood Control District." The District was created by an Act of the California State Legislature, signed by the governor on June 20, 1944.

The Flood Control Act divides Ventura County into four zones. The respective zone boundaries are delineated by following land subdivision lines so that each contains all or part of a major river watershed. Donald R. Warren Co. has prepared reports for each zone, but this discussion is restricted principally to the problems of water conservation and flood control in Zone One.

Zone One contains 221 sq. mi. of the 228 sq. mi. in the Ventura River watershed and additional adjacent areas drained by short streams discharging directly into the Pacific Ocean. Ventura River drains a fan-shaped area and flows south to the Pacific Ocean at San Buenaventura. Elevations vary from 6,000 to 4,000 ft. along its northerly watershed boundary some 21 mi. distant from the ocean. Stream gradients in the mountainous watershed range to more than 800 ft. per mi. The fall in the lower 16.5 mi. of the river below Matilija Creek and North Fork junction, is an average 54 ft. per mi.

The average annual surface flow wasting to the ocean is about 68,000 ac. ft., of which an estimated 46,000 ac. ft. wastes during the winter rainfall and principal runoff months of December to March, inclusive. The river rises quickly

By EVERETT L. CLARK
Principal Hydraulic Engineer
Donald R. Warren Co.
Los Angeles, California

to flood stage and recedes almost as quickly. The agricultural or valley area within the drainage area totals about 31 sq. mi. The ratio of watershed area to valley area is about 7 to 1.

Zone Two contains 843 sq. mi. of the 1,630 sq. mi. of Santa Clara River watershed, the remainder of this watershed being in Los Angeles County.

Zone Three contains practically all of the 325 sq. mi. of the Calleguas Creek watershed.

Zone Four contains 235 sq. mi. of the headwaters drainage area of Cuyama River and two additional separated areas; one in the northeast corner of the county, and the other in the Santa Monica Mountains in the southeast section of Ventura County. With the exception of a few streams draining the west end of Santa Monica Mountains and discharging into the ocean, all the other surface streams in Zone Four flow into the adjacent counties.

Each zone may function separately or jointly with the other zones. It may levy and collect taxes for special and general purposes. The tax rate for general purpose expenditures is limited to 20 cents per \$100.00 of assessed valuation of taxable properties. Taxes for special expenditures are not so limited by the provisions of the Flood Control Act. The obligations attendant to a bonded in-

THIS ARTICLE is a reproduction of a paper presented by Everett L. Clark, formerly senior hydraulic engineer in the hydraulic division of the California Railroad Commission, and now principal hydraulic engineer for Donald R. Warren Co., consulting engineers, at the February meeting of the Junior Forum of the Los Angeles Section of the American Society of Civil Engineers. Because of its interest, Western Construction News requested permission to reproduce it here.

debt are the responsibility of the zone incurring the debt.

The population of Ventura County in 1940 (Federal census) may be divided as follows:

Resident in 5 incorporated cities	35,643
Rural farm population	13,460
Resident in unincorporated communities	20,582
Total population	69,685

The population of the city of San Buenaventura (Ventura) since 1880 has approximated 20 per cent of the total county population. A special Federal census taken in 1945 shows that the county seat, San Buenaventura, increased in population from 13,260 in 1940 to 15,710 in 1945 and that Oxnard had increased from 8,986 to 18,979. Oxnard now enjoys the honor of being the largest city in Ventura County.

The northern section of the county, the most mountainous, may be considered geologically as the structural link between the Coast Range and the mountains of Southern California. It is the principal source of water supply. The rainfall and resultant runoff recharges the underground waters in the alluvium deposits of the lower valley basins and wastes into the ocean. The mountain ridges lie in an east-west direction with many peaks over a mile in elevation. Mt. Pinos and Mt. Frazier are over 8,000 ft. in elevation.

The canyons are more or less V-shaped. The narrow canyons do not provide capacity for large reservoirs. The steep stream gradients and mountain slopes encourage rapid runoff during the heavy rainfall periods and produce floods in the lower reaches. Ventura River, Sespe Creek and Piru Creek tributaries of Santa Clara River, have their headwaters in the north section of the county. However, the streams are intermittent and usually have dry channels during a portion of the runoff season.

The southern section of Ventura County contains low mountains, rolling foothills, and large, gently sloping valleys broadening out into the level Oxnard plain. It is predominantly an agricultural area. The soils are fertile and the climate is excellent for a wide variety of crops. However, the southern section receives less rainfall and depends entirely upon pumping from its underground waters to meet irrigation and domestic water requirements.

Matilija-Hoffman project

The residents of Zone One at a special election on Oct. 16, 1945, voted \$3,400,000 in bonds for construction of the Matilija-Coyote project consisting of:

1. Matilija Dam, forming a 7,000-ac. ft. reservoir on Matilija Creek above the junction of North Fork Creek with Ventura River. This concrete arch dam is

to be 165 ft. in height and is to have an overflow spillway of 60,000 cfs. capacity.

2. Coyote Dam, forming a 22,000-ac. ft. reservoir on Coyote Creek above the junction of Santa Ana Creek. This earthfill dam is to be 120 ft. in height, 920 ft. long, and is to have a 30,000-cfs. spillway located to one side of the embankment.

3. A distribution pipeline system to extend from Matilija reservoir and to convey water to the cities of Ojai and San Buenaventura, to the reservoir on Coyote Creek, to Ojai valleys and to Santa Ana valley.

4. Appurtenances to these structures, rights-of-way, etc.

The work necessary for preparation of final design drawings for Matilija Dam is now in progress and scheduled for completion in the next few months.

The distribution system includes:

1. A conduit from Matilija Dam to the upper end of the present pipeline of the city of San Buenaventura. The conduit is to have a capacity of about 20 cfs. and will supply the city with up to 4,000 ac. ft. per annum.

2. A branch conduit up Canada Larga to deliver 400 ac. ft. per annum, and a small booster pumping station.

3. A branch conduit having a capacity to discharge 20 cfs. into Coyote Creek reservoir.

4. A branch conduit into the upper area of Santa Ana Valley and to Poplin Creek, a tributary of Coyote Creek, to supply an irrigation need for 1,600 ac. ft. per annum.

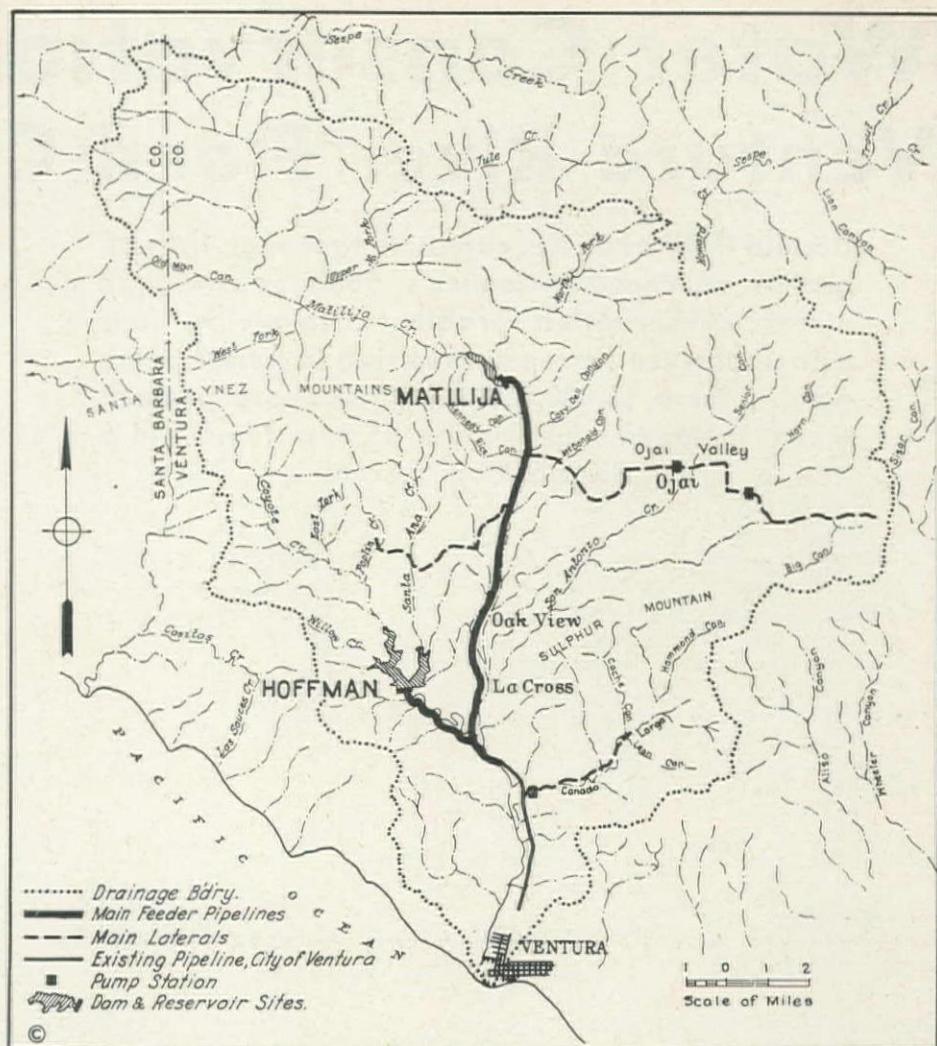
5. A conduit to the city of Ojai, continuing into Ojai Valley and into Upper Ojai Valley to deliver 3,900 ac. ft. per annum in its first reach, 3,600 ac. ft. per annum beyond the city of Ojai and 1,600 ac. ft. per annum to Upper Ojai Valley. Two pumping stations are required, one near San Antonio Creek and the other to lift the water into Upper Ojai Valley.

Cost of water to consumer

All estimated costs of maintaining and operating the project were distributed to sale price of the water to arrive at the cost for water delivered at the conduit. The project, therefore, should carry itself from water revenue when allotted amounts are purchased at costs varying from \$12 to \$32 per ac. ft. per annum. The normal monthly demand for water for domestic use varies from 6 per cent in winter months to 11 per cent during the summer and for irrigation use similarly varies from 3 to 15 per cent of the total annual demand. Each of the conduits is to have designed capacities in accord with the maximum daily demands.

Utilization and needs

The capacity of conduits to Santa Ana Valley and to Ventura and thence to Coyote Creek Reservoir will be utilized during winter rainfall-runoff months to convey surplus flow from Matilija to Coyote Creek Reservoir. This practice will increase the dependable annual yield from storage in Coyote Reservoir from 4,000 to 5,500 ac. ft. per annum. Irrigation waters used in the upper valleys will percolate and contribute to the underground supply and return to the



FLOOD CONTROL and water supply plan for Ventura River watershed, as proposed by Donald R. Warren Co., consulting engineers. Not only will valuable farm and residential land be protected from inundation, but cities of Ventura and Ojai will receive needed domestic water, and Ventura and Ojai valley farmers irrigation supply.

stream at lower levels. The Matilija-Coyote Project permits a widespread beneficial use of the conserved waters, and is the most economical and most practical solution of the immediate need for additional water supply in Zone One.

The city of Ojai and the agricultural areas need additional water to meet present and future requirements. The highly developed agricultural areas in the upper valleys require an adequate water supply and additional water to bring unimproved properties into more productive status.

The city of San Buenaventura needs additional water to obviate the purchase of water, to replace brackish water from its wells near the ocean and to augment its direct diversion from Ventura River at Casitas Dam (a submerged dam extending 970 ft. across the 1,270 ft. of river channel width. The city further needs additional water to provide for future growth in population and to meet steadily increasing industrial requirements.

Floods have been recurrent on the Ventura River. The last major flood, that of March 2, 1938, according to a damage survey by the United States Engineer Office, Los Angeles District, caused direct damage of \$777,000 and in-

direct damage of \$233,000, a total of \$1,010,000 in damages. Based upon the probable frequency of various size floods, occurring once and more than once in a 100-year period, the average total damage from future floods in Ventura River Basin is \$283,800 per annum. The average total damage from floods in Ventura River below Coyote Creek is an estimated \$126,200 per annum, which amount includes \$84,600 of annual damage below the Ventura Avenue oil field.

Flood control projects

The United States Engineer Office, in its "Report on Survey, Ventura River," dated Oct. 15, 1940, found that a levee along the left bank of the Ventura River will give full protection from the probable maximum future flood of 145,000 cfs. at a total first cost of \$1,152,000. Annual charges at \$55,000 against the project are offset by annual benefits of \$73,300 giving an economic ratio of 1.33. The Army Engineers also concluded that a debris basin in Stewart Canyon above Ojai and a concrete channel through the city of Ojai are economically justified at a total first cost of \$587,000. The estimated total federal first cost of these projects is \$1,604,000 for construction, plus a total non-federal

first cost of \$135,000 for utilities relocation, for highway and railroad bridges and for rights-of-way, and a total non-federal annual maintenance cost of \$12,000. The 78th Congress, in the Flood Control Act of 1944, included and authorized the described projects for local flood protection at Ventura and Ojai. Congress has not yet appropriated any moneys for construction of these projects.

The Donald R. Warren Co. investigation included flood control studies that confirmed the need for the flood control projects on the Ventura River as authorized by Congress, and further found that construction of reservoirs at Matilija site on Matilija Creek, at Hoffman site on Coyote Creek and at San Antonio site on San Antonio Creek would not show favorable economic ratio if dedicated to flood control purposes only.

Matilija reservoir, if constructed to a capacity of 19,000 ac. ft., with the top 10,500 ac. ft. reserved for flood control, is economically justified at an economic ratio of 1.17. The maximum flood peak of 145,000 cfs. at Ventura would be reduced by 20,000 cfs., leaving an uncontrollable peak of 125,000 cfs. Such a reduction in the peak flood flow does not obviate the necessity for a levee on lower Ventura River. The reason for the favorable economic ratio of 1.17 is that there is considerable damage caused by floods above the Ventura River levee location authorized by Congress.

Some benefit will be gained from the 7,000-ac. ft. reservoir on Matilija Creek and from the 22,000-ac. ft. reservoir on Coyote Creek by reducing the peak discharge and volume of small floods. Many of the lesser floods on Coyote Creek will go into storage as the runoff record of the past 17 years shows that the natural runoff from Coyote Creek would not have filled the 22,000-ac. ft. reservoir during the period from Oct. 1927 to March 1937. The 7,000-ac. ft. reservoir on Matilija Creek would have filled in each year of recorded runoff, except during the four-year dry period 1927-28 through 1930-31. Both reservoirs will sustain a 4,000-ac. ft. draft plus estimated evaporation and percolation losses during a four-year dry period similar to that of 1927-31. The rainfall records available from 1870 to date and the reconstructed runoff indicate 1927-1931 as a critical period.

Water rights

The matter of water rights is always a subject of interest when the flow of a stream or any portion of that flow is to be retarded in storage reservoirs either for flood control or for conservation purposes. This project does not contemplate any interference with existing established water rights or uses of water from the stream system. On the contrary, it should enhance the value of sources of water or of water rights now being put to beneficial use. The city of San Buenaventura by reason of its ownership of water rights in Matilija Creek could build dams and storage reservoirs on Matilija Creek that would take care of its needs for many decades. This could only be done at the expense of depriving the upper valleys of an adequate

source of future water supply and curtailment of their development. San Buenaventura has wisely chosen to participate with Zone One, of which it is a part, in order that maximum benefit from the waters of the Ventura River may be realized.

Zone One has demonstrated com-

mendable foresight in voting bonds for the construction of Matilija Creek Dam, Coyote Creek Dam and a distribution system to provide and distribute a water supply for its present and future needs. The work preliminary to construction of the Matilija-Coyote Projects is now in progress.

PRELIMINARY ESTIMATES for Matilija and Coyote Creek dams and reservoirs are compared in the following tabulation:

ITEM	MATILJA CREEK (Matilija Dam)	COYOTE CREEK (Hoffman Dam)
Type.....	Concrete arch	Earth fill
Total height.....	165 ft.	120 ft.
Height to spillway crest.....	150 ft.	103 ft.
Spillway depth and freeboard.....	15 ft.	17 ft.
Spillway capacity.....	60,000 cfs.	30,000 cfs.
Reservoir capacity.....	7,000 ac. ft.	22,000 ac. ft.
Average allowance for silt.....	1,000 ac. ft.	1,000 ac. ft.
Average conservation storage.....	6,000 ac. ft.	21,000 ac. ft.
Area below spillway crest.....	123 ac.	535 ac.
Water extends above dam.....	1.5 mi.	2.0 mi.
Average yield per annum.....	4,000 ac. ft.	4,000 ac. ft.
Estimated cost of dam.....	\$700,000	\$1,530,000
Investment per ac. ft. of yield.....	\$175	\$382.50
Investment per ac. ft. of storage.....	\$100	\$70
Average runoff per day (1927-44).....	80 ac. ft.	33 ac. ft.
Average annual runoff (1927-44).....	28,000 ac. ft.	11,700 ac. ft.
Minimum annual runoff (1930-31).....	1,950 ac. ft.	563 ac. ft.
Maximum annual runoff (1940-41).....	125,280 ac. ft.	50,800 ac. ft.
March 2, 1938, flood peak.....	15,900 cfs.	11,500 cfs.
1870-1940 mean annual rainfall.....	34 in.	26 in.
Watershed area above dam.....	55 sq. mi.	35 sq. mi.

Raver Compares Price Offers For Northwest Electric Firm

TESTIFYING BEFORE the Boren committee which is investigating current negotiations to purchase electric properties of the Puget Sound Power & Light Company, Bonneville Power Administrator Paul J. Raver reviewed details of the \$90,000,000 offer which he made to the company in March 1944 as negotiating agent for public utility districts in the Puget Sound area, the city of Seattle and the federal government.

Raver stated his offer of \$90,000,000 for the company's electric properties was arrived at after careful analysis of all factors involved and would have given the company an amount sufficient to enable it to retire its bonds at the call price, the preferred stock at its par value of \$100 per share, and to pay the new common stock at least its full par value of \$10 per share. The offer was rejected.

However, Raver said, his \$90,000,000 offer could not properly be compared with the \$135,000,000 figure associated with the proposal recently made by Guy C. Myers, acting as fiscal agent for a number of PUDs in the Puget Sound area.

"The current proposal apparently contemplates purchase of all assets of the company except the non-electric properties, including the assumption of all liabilities, provision for employees' annuities, payment of the cost of liquida-

tion of the company, and payment of the capital gains tax. These latter elements were not contained in my offer," Raver said.

"In order to make a comparison of the Myers' proposal with my offer, certain items should be excluded from the former. Because of the lack of full information, the values assigned to the items eliminated are estimates.

"The items are as follows: net current assets, \$5,240,028; bond discount, \$1,400,000; difference in amount for employees' annuities, \$1,000,000; 20 per cent of fiscal agent's fee, \$267,000; contingent expenses, \$200,000; capital gains tax \$15,723,200; net capital additions to plant, Dec. 31, 1943, to Dec. 31, 1944, \$1,543,426.

"These amounts total \$23,372,654, which if deducted from the \$135,000,000 figure results in a net price of \$109,628,346. This amount is \$19,628,346 more than I offered for the same items of property."

Raver explained that judgments as to the permanency of the earnings position of the properties, the portion of these earnings, if any, which belong to the rate payers under proper rate regulation, rather than to stockholders, the fair capitalization rate and other elements of a similar nature all have a bearing on the final judgment as to a reasonable price to be offered.

Timber Hangars Collapsed by Winds

DURING THE STRESS of the war emergency the U. S. Navy erected timber lighter-than-air hangars or docks at ten different locations throughout the country. Of these, three installations were on the Pacific Coast, Santa Ana and Moffett Field, Calif., and Tillamook, Ore. The construction of these units was described in *Western Construction News* for August, 1943, and January, 1944.

The hangars are uniformly 300 ft. wide, 1,060 ft. long and 180 ft. high, without interior partitions. The framed timber arches are 20 ft. on center, 19 ft. deep at the heel and 13.6 ft. at the crown. Timbers in the arches vary from 3 x 12 in. to 6 x 14 in.

One of the units at Santa Ana collapsed during construction when subjected to a strong wind, but this was explained by the fact that braces and anchors of various kinds had not been placed at that point of partial completion. However, three of the hangars were demolished on Sept. 15, 1945, at Richmond, Fla., by a wind of hurricane proportions, and the debris largely destroyed by the subsequent fire.

Inasmuch as similar units exist on the West Coast, a review of the report of seven structural engineers who examined the Florida disaster immediately after the hurricane will be of interest. The engineers who collaborated in the report were: Verne Ketchum and J. F. Haldeman, Timber Structures, Inc.; F. A. Hartman and R. C. Bastress, Protexol Corporation; R. H. Bescher of the Wood Preserving Division, Koppers Company, Inc.; Henry Garnjobst, Jr., American Lumber & Treating Co., and Frank J. Hanrahan, National Lumber Manufacturers Association.

Summary of findings

Available evidence indicates:

1. Each of the three hangars collapsed separately during peak, or near peak, winds of the hurricane.
2. Intense fires were started and fed by the contents of each hangar separately following collapse.
3. Even though untreated interior portions of the wood members were often exposed through breakage after falling, the fire-retardant treatment of the wood prevented or assisted in preventing fire and spread of fire where the fire was not fed directly by the highly combustible contents of the buildings such as high octane gasoline.

4. The structural failures may be considered in the "Act of God" classification due to the application of hurricane wind forces far in excess of those anticipated and designed for. Although the design and construction of the structures were well executed, it is unreasonable to expect that the structures, which were designed for but a fraction of the load experienced, could withstand hurricane forces of the magnitude experienced.

Design

The main structural framing of the

hangars was designed to resist a wind of 100 mi. per hr. using the then currently recommended design stresses for the grades of lumber specified with no increase in allowable stresses for short-time duration of loading, but this was only an approximation. The design was actually made to resist a wind of 110 mi. per hr.

It is not within the scope of this report to comment on the advisability of selecting the 110 m.p.h. wind as a design basis. It is presumed that, in selecting the 110 m.p.h. wind as a design basis for these war structures, consideration was given to the relative economy of design for various wind velocities and the probability of obtaining various wind velocities as is ordinarily done in the case of the design of hydraulic structures for maximum floods of infrequent occurrence. It should be pointed out that the Weather Bureau's reports (available at time of design) for Miami, Florida, covering a 33-year period show a maximum velocity of 87 m.p.h. (5-min. period) and an extreme velocity of 96 m.p.h.

The columns (compression members) of the main arch framing had 1/d (unsupported length to least dimension) ratios which placed them in the range of long (Euler) columns. The strength of such columns is dependent on the modulus of elasticity rather than the compressive strength of the wood. Although allowable design stresses for loads of short-time duration may be increased beyond those for loads of long-time duration, the modulus of elasticity may not be so increased. Consequently, it is not proper to assume that the Euler columns which depend on the modulus of elasticity for strength would support greater loads for a short-time duration of loading than for a long-time duration of loading. Such an **improper** assumption was not made in the design.

Lumber and connectors

On the plans, a 1400 lb. f-1100 lb. c grade of lumber was specified for chords and webbing of the arches and a 1200 lb. f-1000 lb. c grade for the rest of the framing. Although Douglas fir arch members grade-marked "1200 lb. f" and "Selected Structural" (1600 lb. f) were found on the site, in this instance that would not be an indication that material of lower grade than specified or of

a higher non-dense grade was used. This is explained by the fact that prior to March 1, 1943, at which date the West Coast Bureau of Lumber Grades and Inspection of the West Coast Lumbermen's Association issued its Rule Book No. 12, grade-marked Douglas fir lumber of both 1200 lb. f and 1400 lb. f grades was marked with the 1200 lb. f stamp. The 1400 lb. f material was obtained through specification and application of a paragraph of the Rules to require that the material meet the density requirements in addition to being selected on the basis of grading rules for the 1200 lb. f grade. Subsequent to the aforementioned date, provision was made for using different grade marks for 1200 lb. f and 1400 lb. f material. Since most, if not all, of the material used in these hangars was procured and fabricated prior to March 1, 1943, when the 1400 lb. f grade stamps were first issued, it follows that the 1400 lb. f grade stamps could not appear on this material.

Further, it appears that the material was inspected three times, i.e., by the lumber-grading agency, by the fabricator and by the Navy before acceptance. The framing lumber found on the site, being relatively clear and straight-grained, was of high commercial quality.

No evidence of any decay was found.

The timber connectors found on the site were of the specified size and type which were of a standard make. No evidence of failure of connectors or bolts was found.

Fire-retardant treatment

Fire-retardant treatment of all lumber, except that in the lean-tos, was specified to protect the lumber in the hangars from the hazard of fires which might occur in shops, storage rooms and office space located at ground level along both sides of the hangars and from possible fires started by such sources as incendiary bombs, lightning and refueling operations. It was specified that all lumber be given a fire-retardant treatment using the pressure method.

Since acceptance of this material was based on performance, fire tests using the special Crib Test (ASTM designation C 160-41T) conducted under Navy inspection, there appears to be no reason to question the conformance of the treated wood with the specification. Definite limits are set up in the specification to cover continued flame and glow as well as loss of weight and tests are run on samples taken from each 5,000 bd. ft. of lumber. Under the exposure conditions, the fire-retardant chemicals were relatively permanent.

No evidence of faulty fabrication or erection was found. The portions of the framing which remained standing after the collapse appeared to be in excellent structural condition. Also maintenance men who had examined the structures in detail while tightening the bolts during regular servicing operations reported that they had not observed any struc-

Seven structural engineers present report of findings after examination of Florida hangar disaster caused by wind of hurricane proportions and subsequent fires—no evidence of faulty fabrication or erection discovered, but design was based on wind velocities lower than that experienced

tural defects which might have contributed to the collapse of the structure.

Factors contributing to collapse

In the design, considerable reliance was placed on the horizontal sheathing for bracing the top chords of the arches. It was noted that, in some cases, individual pieces of the two-inch tongued and grooved planking used as sheathing did not bear on two or more rafters. However, it is not believed that this condition was prevalent enough to be an important factor in preventing collapse under the high winds experienced.

It is reported that at the time of the hurricane, the doors were closed to protect inflated blimps from bouncing around, but that leeward skylights were open. In any case, the volume of air contained in a structure of this magnitude is so large it would appear impractical to provide sufficient ventilation to permit substantial equalization of the rapidly varying pressures to be expected in a hurricane. All of the leaves of the steel-framed end doors (except those which were blown down and destroyed) were dished inwards at both ends of all three hangars with a permanent deformation of two to six inches. This would seem to indicate a lack of equalization of pressures. Other reported observations made during collapse indicate that inadequate ventilation may have contributed to inducing more severe stresses than might otherwise have been the case.

Wind velocities

Anemometers at the Naval Air Station, Richmond, were inoperative at peak wind velocities and at the time of collapse of the structures. Consequently, only estimates of wind velocities based on meteorological data obtained from the hurricane area and known characteristics of hurricanes are available.

From estimated lulls, during passing of the eye of the hurricane, of 20 min. at the city of Homestead, 50 min. at the Homestead Army Air Base, and of 5 min. at the Richmond Naval Air Station, near-eye lull at Carysfort Reef Light, similar data from other points, and the general path of the hurricane, it appears that the eastern side of the hurricane passed over the Richmond Station. The hurricane progressed at an average rate of 16 m.p.h. and, being in the Northern Hemisphere, rotated counter-clockwise. Combination of linear and circular wind velocities would indicate that the wind velocity on the eastern side of the hurricane was approximately 16 m.p.h. faster than the average velocity of the hurricane, and 32 mi. faster than on the western side of the hurricane.

At the Carysfort Reef Light weather station, which was on the western side of the hurricane, a maximum wind velocity (5 min. average) of 123 m.p.h. was measured during the first wind and 127 m.p.h. during the second wind. For the eastern side of the hurricane which passed over the Richmond Station, the indicated maximum velocity (5 min. average) after correction of the lower of the two preceding values for combination of linear and circular wind movements, is 155 m.p.h. Also, at Carysfort



TIMBER TRUSS construction on one of the blimp hangars erected at Santa Ana, Calif., similar in all details to those destroyed by wind and fire in Florida hurricane.

Reef Light a two minute average wind velocity of 138 m.p.h. was measured. After a similar correction, a two minute average velocity of 170 m.p.h. is indicated for the Richmond Station. All of the above measured wind velocities are true velocities, i.e., corrected for instrument errors.

On the basis of such information and additional checks, it may be assumed that at the Richmond Naval Air Station the wind velocity of the hurricane reached at least 155 m.p.h. as a 5-min. average, 170 m.p.h. as a 2-min. average, 178 m.p.h. for the fastest mile, and 196 m.p.h. for a few seconds at an elevation of about 110 ft. above ground.

A multiplying factor sometimes used at lower velocities for adjusting the fastest mile of wind to extreme gust velocities is 1.42 which, if applied to the 178 m.p.h. fastest mile, indicates highest gust velocities of about 250 m.p.h. at the Richmond Naval Air Station.

An average figure for adjusting wind velocity for height above ground (at lower velocities for which data are available) is the one-seventh power of the ratio of the height at which wind velocity is desired to that at which wind velocity is measured. Adjusting wind velocities from a height of 110 ft. (elevation of instrument) to a height of 160 ft. (upper portion of structure) would give a multiplying factor of 1.06 to be applied to the velocities at the 110-ft. level. If

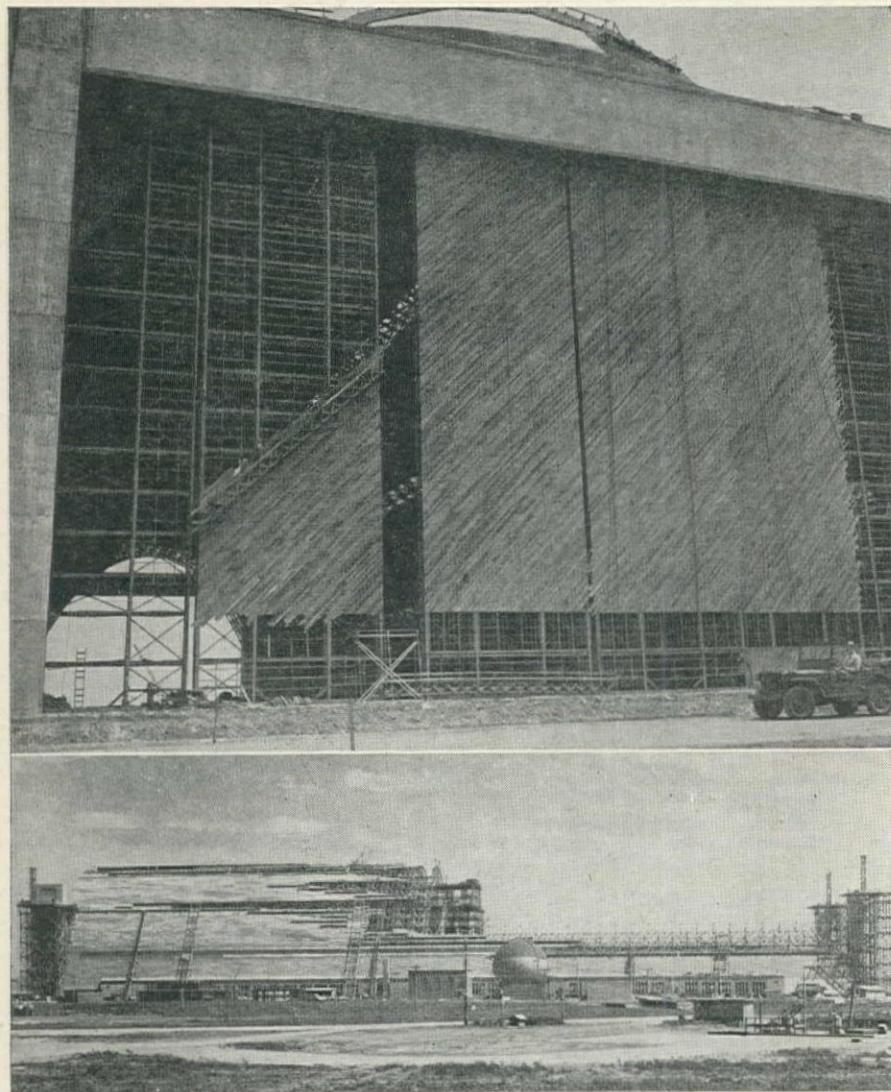
this average adjustment is applied to the more conservative estimates, the wind velocities near the top of the structures would be in the order of 164 m.p.h. for 5 min., 180 m.p.h. for 2 min., 189 m.p.h. for the fastest mile and 208 m.p.h. for a few seconds.

Certainly it would appear very conservative to assume that at the Richmond Naval Air Station there were wind velocities exceeding 175 m.p.h. for a considerable period of time, with the probability that at least parts of the structures could be subjected to much higher winds for shorter periods.

Structural performance

Since available information on the action of the structures during collapse is of a sketchy nature because safety was naturally the paramount interest of those in a position to make observations, it appears impractical to attempt to reconstruct what happened in sufficient detail to be of much assistance in determining which members failed first and why. Neither is it practical to do so from the remaining timbers which were damaged extensively in falling from great heights. However, comparison of wind pressures designed for with those of the estimated actual winds appears to afford a basis of judgment as to whether the structure should be expected to stand or collapse.

In general, wind pressures vary with



TIMBER HANGARS during construction at Santa Ana, Calif. Top is detail of steel frame, wood-sheathed doors, similar to those dished in by Florida hurricane, bottom is the structure partially completed.

The intensity of the fire was indicated by fusion of glass, melting of copper parts of planes, burning of various other metal parts of planes to ashes, deeply spalled concrete floors and bents, and similar items. From such indications it is estimated that the fire temperatures exceeded 2,000 deg. F.

There were intermittent, heavy rains, but it was reported that the rain did not appear to materially affect the fires.

Some of the fire-fighting equipment, primarily intended for normal use within the hangars, was destroyed and therefore inoperative. Approximately four hours after the start of the fires, fire fighting equipment arrived from adjacent areas.

No organic material could be expected to resist consumption under such high and sustained temperatures. However, there was evidence that the fire-retardant-treated lumber prevented or assisted in preventing spread of fire where not fed directly by highly inflammable fuel.

For example, places were noted where within a distance of approximately ten feet the sheathing on standing portions of the structures progressed from completely burned, through charred and blackened wood to bright wood indicating that the fire had been stopped but a few feet from intense flames. At a number of places within and without the hangars, fires in piles of wood debris as high as three feet were stopped abruptly indicating the wood itself was incapable of supporting the fire. Also, cases were observed where fire had progressed somewhat farther in the untreated center portions of individual sticks of lumber than at the exterior treated portions.

Conclusions

Conclusions drawn from available evidence include:

1. Although a designer cannot proceed with the assurance of complete knowledge of wind load distributions in such structures, it appears that the structures were designed with reasonable care for 110 m.p.h. winds. However, for the compression arch members, which were within the range of long (Euler) columns, no increase of strength of structure over and above the limits of the normal factors of safety for long-time loading should be expected for short-time loading such as wind.

2. The acceptance of materials used in the structure was by Navy inspection or performance tests and no evidence was found which indicates that material inferior to that specified was used.

3. No evidence of faulty fabrication or erection was found.

4. It appears that the structures were properly maintained to insure structural integrity.

5. Although the use of some short-length sheathing and inadequate ventilation for equalizing air pressures on

(Continued on page 119)

the square of the wind velocity. In this case it appears that temperature and humidities were practically constant during the storm, which makes adjustments for such factors of little significance. Since it is estimated that winds reached a velocity of at least 175 m.p.h., it would be expected that the wind forces

were at least $\frac{175^2}{110}$ or 2.53 times those designed for.

In deriving the working stresses used in the design for the Euler columns, the test loads are divided by three; i.e., a factor of 3 was inserted in the Euler formula to adjust the values from ultimate test values to working values. This factor of three is applied to test results for columns loaded as accurately axially as laboratory technique permits. It contemplates certain inaccuracies in actual application of load, some variability in the actual modulus of elasticity of different pieces of lumber, tolerances for design, fabrication, erection and other contingencies, for there would be no justification in actually providing three times the strength needed to fulfill the requirements of an anticipated service. Therefore, the actual strength of the structures containing all the items and contingencies allowed for in the factor of three, should be expected to be con-

siderably less than three times the design load, particularly in this case where some eccentricity is inherent and lateral buckling would be the principal criterion for column failure. Consequently, it would appear unreasonable to expect these structures as designed to withstand the load which was imposed.

Fire performance

Available evidence indicates that the fires in each hangar started subsequent to the structural collapse of at least portions of the structure. Presumably the falling timbers striking gasoline tanks of the aircraft within the building released high octane gasoline vapors and gasoline which were ignited by sparks from aircraft batteries, by falling metal fastenings striking the concrete floor or metal parts of aircraft and automobiles, or by shorts from broken electrical circuits.

The exact amount of fuel in the various fuel tanks is not definitely known, but as a rough approximation the quantity was believed to be in excess of 40,000 gal. scattered throughout the hangars in the 14 blimps in operating condition, 366 airplanes and 150 automobiles housed in the three structures. Also there appeared to be other highly inflammable contents such as blimp bags, dope for blimp bags, etc.

Western Association Officers—1946

A. S. C. E.

Newly elected officers of the Intermountain Section, A. S. C. E., are: **Robert G. Harding**, Salt Lake City, president; **Ralf Woolley**, Salt Lake City, first vice president; **Edwin U. Moser**, Logan, second vice president, and **Carl E. Painter**, Salt Lake City, secretary-treasurer. Harding is a consulting engineer, specializing in sewage treatment plants and waterworks construction. He is also second vice president of the Utah Society of Professional Engineers.



At the annual meeting of the Arizona Section of A.S.C.E., **George T. Grove**, County Engineer of Pima Co. was elected president; **L. R. Dail**, Phoenix contractor, was named first vice president; **Walter Johannessen**, member of the consulting firm of Johannessen & Girand, was made second vice president; and **John A. Baumgartner**, an engineer with the U. S. Geological Survey, was elected secretary-treasurer. **Wayne G. O'Hara**, retiring president, becomes a member of the Board of Direction.

Ben E. Torpen of the U. S. Engineer Dept. is the 1946 president of the Oregon Section, A. S. C. E. Other officers are, first vice president, **C. B. McCullough**; second vice president; **N. H. Leupold**; secretary, **Mark L. Nelson**; assistant secretary, **F. O. McGrew, Jr.**, and treasurer, **T. M. Davis**.



The newly-organized Montana section of the American Society of Civil Engineers has announced its officers. **Charles S. Heidel** is president, **David M. MacAlpine** is vice president, **George F. Sahinen** is vice president, and **Roland H. Willcomb** is secretary.

A. G. C.

Additional directors elected by the Southern California Chapter of A.G.C. after the annual meeting were **Vincent Bressi**, **John MacLeod**, **J. A. McNeil** and **M. F. Kemper**.

E. J. Maupin, Jr., of Dodge Construction Co., Fallon, was elected president of the Nevada Chapter of A.G.C. for 1946; **E. E. Gaines** of Reno and **Ludwig Flyge**, Reno, vice presidents; and **C. V. Isbell**, Reno, retiring president, treasurer. **Charles L.**

Hill was reappointed secretary-manager. Other directors of the chapter are **O. J. Scherer** of Las Vegas, **F. R. Smith**, Reno, and **Roy Cram** of Las Vegas.

At the annual meeting of the Montana Contractors' Association on Jan. 23rd, **L. M. Sheridan** of Butte was elected president for 1946, **Dan J. Mooney** of Butte was named vice president, and **Rex Fuller** of Butte, secretary-treasurer. Directors included **W. A. Culp**, Great Falls; **E. J. McLaughlin**, Livingston; **George Nilson**, Great Falls; **Ed O'Neil**, Havre; **W. P. Roscoe**, Billings; **L. M. Sheridan**, Butte, and **M. H. Archibald**, Sheridan, Wyo.

W. H. Puckett, vice president of Morrison-Knudsen Co., Boise, was elected president of the Idaho Branch of Associated General Contractors at the annual meeting. Other officers included, **Ernest White**, Twin Falls, vice president, and **L. D. Robbins**, Boise, secretary-treasurer. Hold-over directors are **Tony Marrazzo** and **Harry Lohnitz**, both of Boise. New directors are **R. B. Johnson**, Lewiston, **A. D. Stanley** and **J. W. Terteling**, both of Boise.



Don Mowat has been named president for 1946 of the Seattle, Wash., Chapter of A.G.C. **O. B. Daniels** was elected vice president, **John Sellen** was made secretary, and **Elmer Edwards**, treasurer. The executive committee is composed of **J. C. Boespflug**, retiring president, **A. L. Atherton** and **George Teufel**.

H. Earl Parker, Marysville, is the 1946 president of the Northern California Chapter, A.G.C., and **George H. Atkinson** of the Guy F. Atkinson Co. was named vice president. Other directors are **Al Biasotti** of Louis Biasotti & Son, **Charles L. Harney**, **Lloyd E. Holton** of Tide Water Associated Oil Co., **George C. Loorz** of Stolte, Inc., **H. C. Maginn** of Calaveras Cement Co., **E. F. Modglin** of M. and K. Co., and **Lynn A. Schloss** of Ransome Co.

Other Groups

Paul E. Bonelli was elected president of the Portland Home Builders Association at the annual meeting recently. **Ray Cady** was elected vice president and **Lester Asbahr** became secretary-treasurer. **Col. Carlos Huntington** continues as executive secretary. Executive Board members are **A. C. Miller**, **Herman Schmidt**, **Fred Goldenberg**, **Robert Smith**, **J. B. Lewis** and **Ralph Davis**.

Elected as officers of the Engineers' Club of Stockton, Calif., for 1946, are **E. C. Nelson**, president, **E. D. Thoits**, vice president, **R. M. Brittsan**, secretary, and **Frank Belalato** and **Fred Spiekerman**, members of the executive committee.

The officers of the Engineers Club of Fresno, Calif., are **J. P. Price**, engineer with the General Electric Co., president; **J. P. McElroy**, vice president; and **H. Wayne Stone**, secretary-treasurer. Directors are **H. M. Patton**, **G. A. Peers**, **Frank Roush**, **J. A. Triscuit** and **Earl T. Scott**.



The Western Association of State Highway Officials, dormant during the war years, has resumed its activities and representatives of twelve western states attending the meeting of the American Association of State Highway Officials recently held in Oklahoma City elected **Bernard Touhey**, Arizona State Highway Engineer, president of the Western group; and **J. R. Bromley**, State Highway Superintendent of Wyoming, as vice president.

James Reid, District Engineer of the State Bureau of Highways at Lewiston, is the 1946 president of the Idaho Society of Engineers. **Lloyd E. Stalker**, architect of Idaho Falls, is vice president; **W. Purdy Eaton**, designing engineer for the Highway Bureau, was reelected for the sixth time as secretary, and **Archie L. Biladeau** of the State Health Department, treasurer.



J. G. McGivern was elected president of the Associated Engineers of Spokane, Wash., at the organization's annual banquet. Other officers are **H. C. Bender**, **Noel Thompson**, **Bliss Moore** and **W. L. Thrall**, vice presidents, and **H. C. Swann**, secretary-treasurer.

The 1946 officers of the Colorado Society of Engineers are **Dana E. Kepner**, president, **Paul K. Seyler**, vice president, and **C. M. Lightburn**, secretary-treasurer. Directors, in addition to the above, are **R. W. Lindsay**, **Ralph N. Tracy**, **G. H. Garrett**, **A. A. Matthews**, **C. E. Dobbin**, **Adolph Zulian**, **John McGowan** and **Ralph E. Hubbard**.



— LATE FLASH —

Charles L. Harney and **B. F. Modglin**, both past presidents of Northern California Chapter, A.G.C., have been elected national directors of the contractors' organization.

Sewer Program in Washington

THE WASHINGTON Pollution Control Commission immediately after its formation inaugurated a program of planning postwar sewerage and sewage treatment works construction. Letters were written to municipalities throughout the state pointing out their sewage disposal needs and urging the necessity of immediate preliminary planning for the correction of the pollution problem. It was pointed out that not only would the early construction of adequate municipal sewerage systems and sewage treatment works improve the quality of the streams but also provide worthwhile postwar construction projects of a lasting nature furnishing jobs to thousands of returning veterans.

The recently adopted law establishing the cooperative Commission, with authority to determine when pollution exists and providing the necessary legal machinery for prosecution and enforcement of the Act, has greatly accelerated the construction of pollution abatement works. The act applies to both municipal and industrial pollution. The result of the Commission's campaign for the abatement of municipal pollution is apparent from the summary of the present status of planning by municipalities.

Industrial conversion

Conferences have been held with various industrial groups and more particularly with representatives of the pulp mills of the state. At this conference the pulp mill operators signified their intention of correcting their pollution problems and are planning accordingly. There is no method by which the costs of such pollution correction can be ascertained. It is pertinent to note that the Weyerhaeuser Pulp Co., at Longview, is converting its plant to a magnesium base for its cooking liquor instead of calcium which is generally used. The company expects to spend over \$1,500,000 in a conversion that will eliminate all sulphite waste liquor from the Columbia River. The plant in Everett will eventually be converted. In this connection it might be well to state that it is the policy of the State Pollution Control Commission to effect its purpose by persuasion and cooperation, and when this fails, the laws of the state are invoked and enforced.

At the present time 51 municipalities of the state have engaged engineers to prepare preliminary or final plans for sewer systems and treatment plants at an estimated cost of \$21,557,085. Another 28 communities, equally as far along with their planning, have submitted no cost estimates to the Commission. From facts available and investigations made in the field this expenditure is conservatively estimated at \$2,340,000. To date, sewer projects on the drafting board, planned or authorized, total \$23,897,055.

The Pollution Control Commission in its program for sewerage improvements has worked closely with the State Department of Health. The State Depart-

THE 1945 SESSION of the Washington State Legislature created a Pollution Control Commission composed of the State Department of Conservation and Development, Departments of Fisheries, Game, Agriculture and Health, and a Director to be appointed by the Governor. The Commission was given broad powers in the control of pollution of all surface waters and water courses throughout the state.

The Commission started functioning as of June 7, 1945. As provided by the Act, rules and regulations were drawn up and also Stream Standards for the State. Jack Taylor of Seattle was appointed Director of the Commission. He presents herewith a summary of the Commission's activities to date.

By JACK TAYLOR
Director
Washington Pollution Control Commission
Olympia, Washington

ment of Health has carried on exhaustive field investigations and the Commission is greatly indebted to it for technical assistance in furthering the pollution control program.

Municipal projects outlined

Following is a summary of the present status of planning by municipalities:

ABERDEEN: The city council approves an expenditure of \$3,000 to hire technical advice on city projects, including a sewage disposal plant. Cost estimated not available.

ANACORTES: Preliminary plans have been completed for the extension of sewer laterals. The estimated cost is \$75,000.

AUBURN: Plans for financing a sewage disposal plant are in the preliminary stage. Plant estimated to cost \$100,000.

BANGOR NAVY DEPOT: Design and detailed plans are being prepared to double the size of the existing sewage disposal plant. No estimate of cost.

BELLINGHAM: \$3,300 has been advanced to the city by the government for preliminary planning for storm sewers, sanitary sewers and two disposal plants estimated to cost \$1,030,558.

BREMERTON: Plans describing Capitol Hill sewer extension approved by the Commission provided that specifications be submitted and approved before construction starts. Cost estimated at \$100,000.

CAMAS: A local improvement district has voted bonds in the amount of \$120,000 for storm and sanitary sewer project. No estimated cost of disposal plant.

CASTLE ROCK: Reports and plans giving preliminary data for sewerage system and disposal. Application has been made to the FWA for an advance to defray preliminary engineering costs. Estimated cost of system, \$163,800.

CHEHALIS: City has engaged firm of engineers to prepare plans for sewerage system and sewage disposal plant. Application has been made to FWA for preliminary planning funds. No estimate of cost of the project.

CLARKSTON: The Commission has approved preliminary plans for sewage disposal plant. The city has voted \$8,000 for completion of final plans. Total estimated cost is \$76,000.

COLFAX: City plans a major improvement on the sewer system to include replacement of approximately 6 mi. of wooden sewers. No estimate of costs.

DAVENPORT: Planning sewage treatment plant to replace an overloaded septic tank. Estimated cost \$30,000.

DEER PARK: City is unsewered. Field surveys completed and preliminary plans are being prepared for sewerage system and treatment plant. Cost estimate not available.

EATONVILLE: A firm of engineers is preparing plans for a water system, sewerage system and disposal plant costing \$185,000.

ENUMCLAW: An engineer has been employed to make a study of the city's sewer problem. Application has been made to FWA for \$5,100 to prepare plans for trunk lines and disposal plant estimated to cost \$125,000.

EPHRATA: Treatment plant completed in 1939 is operating at design load. Preliminary plans completed to increase capacity by 150 per cent at an estimated cost of \$50,000. The city is also planning to immediately construct a new force main on the plant outfall at a cost of \$8,000.

EVERETT: Plans have been approved by the Commission for extension of sewer system. Modern sewage disposal system under consideration. Costs have been estimated to total \$429,606.

FIRCREST: \$1,450 has been advanced by the FWA to defray engineering costs of a disposal plant estimated to cost \$40,000. Plant expected to be in operation within year.

GOLDDENDALE: Modern treatment plant started in 1940. Because of the war, and city finances, project has not been completed. Engineer has been making plans and financial arrangements for completion. Estimated cost, \$20,000.

GRAND COULEE: Planned improvements include a complete sewage treatment plant and major extensions and replacements of the present sewer system. Present sewage disposal is causing pollution of lake back of the dam. Field investigations have been completed. Cost estimated at \$360,000.

GRANDVIEW: General layout and flow diagram of sewage treatment plant has been submitted for approval. Plant estimated to cost \$90,000. Lateral sewer improvements costing \$1,800 are also planned.

HOQUIAM: City has partially prepared plans for a storm water sewer system estimated to cost \$309,000.

KELSO: Cowlitz County Commissioners have submitted data to FWA covering proposed modernization of Sewer District No. 16 treating plant and system. The estimated cost of the work is \$200,000.

KELSO: Preliminary plans have been completed and city is arranging for construction of a sewage disposal plant in West Kelso. No estimate of cost.

KENNEWICK: Preliminary engineering investigations have been made and a report prepared outlining a project which includes lateral extensions, trunk and interceptors and treatment estimated to cost a total of \$333,000.

KENT: City has engaged a firm of engineers to prepare plans for a modern disposal plant at near \$75,000.

KIRKLAND: Engineer has been employed to prepare plans for the construction of what is known as the Rose Point Sewer System at an estimated cost of \$135,000.

LIND: Modern treatment plant planned to replace a septic tank. Investigations being made into the possibility of sub-surface disposal. Estimated cost is \$15,000.

LONG BEACH: Plans have been prepared for sewerage system and treatment plant to protect the Ocean Beach recreation area; estimated cost is \$140,000.

LONGVIEW: Application is being drafted for federal aid to assist in planning a sewage treatment plant estimated to cost \$150,000.

MARYSVILLE: City is studying plans for financing proposed sewer extension to cost \$13,255.

MCCLEARY: The city has been advanced \$5,500 by FWA for preparation of plans for a sewerage system estimated to cost \$79,750.

MONROE: Preliminary plans have been approved by the Commission for sewage treatment plant. Sewer system and disposal plant is estimated to cost \$100,000.

MOUNT VERNON: Engineers have advised the city that a sewage disposal plant and additions to the present system would cost approximately \$303,335. Engineers authorized to apply for federal planning funds.

NEWPORT: City recently voted \$35,000 towards financing of a trunk sewer and treatment plant; \$90,000 in revenue bonds had previously been voted. Plans now being prepared by engineers.

OKANOGAN: An engineer has been working on plans for a sewage disposal plant and sewer system estimated to cost \$140,000.

OLYMPIA: Interceptor sewers and treatment plant is in the planning stage.

Two-mill levy in 1944 raised \$10,000. In 1945 a four-mill levy brought the total to \$30,000. Recently the city purchased a site for a disposal plant for \$5,000. Cost estimated at \$1,500,000.

OMAK: Engineer requested to submit preliminary report of early stages of design on treatment works. Plans have been completed for sewerage system. A financial reserve has been established by diverting allowable tax millage into a sinking fund. Total estimated cost of treatment and sewer system, \$144,000.

PASCO: Construction of a new sewage treatment plant has been planned, together with major sewer extensions. Cost figures are not available.

PATEROS: The city has employed a firm of engineers to plan a sanitary sewer system estimated to cost \$101,000.

POMEROY: In 1942 the city council authorized the sale of revenue bonds for waterworks and sewage disposal improvements. Plans were to have included treatment for cannery wastes to cost \$55,000. Consideration is now being given to a separate plant for the city.

PORT ANGELES: The city has contracted with a firm of engineers to make plans for complete sewage disposal. Application has been made to the FWA to defray preliminary engineering costs. No estimate of cost of project available.

PROSSER: Plans have been drawn for a sewage treatment plant costing \$60,000. Temporary approval has been given a lagoon method of treatment until such time as the treatment plant is built.

PULLMAN: A firm of engineers is preparing plans for a \$180,000 sewage disposal system. Preliminary negotiations have been completed. The Commission recently approved the construction of a \$6,000 sewer line to serve trailer camp relieving housing shortage at State College. Extension limited to present scope until treatment plant completed.

PUYALLUP: Engineers are preparing plans for a sewerage system and treatment plant. Preliminary report has been submitted to the Commission for approval. \$400,000 in revenue bonds has been issued and \$200,000 more is contemplated. The voters have authorized a bond issue of \$700,000.

QUINCY: At recent election city was authorized to issue revenue bonds in the amount of \$60,000 for the construction of a new sewerage system and disposal plant. No estimate of cost.

RAYMOND: Engineer has been commissioned to prepare plans for sewer extensions and sewage disposal plant. No estimate of cost. Also an addition to the sewer system from 5th Street to the Island is planned at an approximate cost of \$35,000.

ST. JOHN: Preliminary plans and design data for sewage disposal system approved by the Commission.

SEATTLE: Approximately 80 per cent of lateral sewer system within the present city limits has been completed; \$2,046,500 will be needed to construct the balance. Interceptor sewers needed are estimated at \$2,007,000. The extension of existing sewer outfalls, as

planned, would cost approximately \$250,000. Contemplated improvements, including those mentioned above, have been variously estimated from \$4,303,500 to \$5,000,000.

SEDRO WOOLLEY: Engineers are preparing plans for a sewer system and disposal plant estimated to cost \$201,000.

SELAH: Engineer has been instructed to prepare plans for extension of sewerage system and enlargement of treatment plant. No cost estimate.

SNOHOMISH: Plans for major extensions, interceptors and sewage treatment have been completed at an estimated cost of \$145,481. Industrial development may increase costs.

SOAP LAKE: Preliminary plans have been completed on a project to include major lateral extensions, trunk sewers, raw sewage lift station, force main and treatment plant. Estimated cost, \$155,000.

SPOKANE: Plans are being completed which will involve 11 mi. of new sewers, including mains from Parkwater and packing plants. The sewers will cost \$2,800,000, disposal plant \$800,000, and land \$200,000.

SUNNYSIDE: Construction drawings have been completed for lateral extensions and new sewage treatment plant; cost, \$170,000.

TACOMA: Preliminary plans and reports outlining the program of sewer construction have been received by the Commission. Voters of the city approved a \$3,000,000 bond issue Nov. 7, 1944. The project will include additional lateral sewers, trunk and intercepting sewers and treatment plant to serve areas contributing sewage to the bay and waterways in the center of the city.

TEKOA: Engineering firm has been retained to plan major sewer extensions and treatment plant. Preliminary steps have been taken to obtain necessary land and right-of-way. No cost estimate given.

TENINO: Firm of engineers has been retained to make preliminary estimates for a sewerage system. No cost estimate.

TOLEDO: Report with accompanying plans giving preliminary data on sewerage system and treatment plant received from engineers for review by the Commission. No cost estimate.

TONASKET: Engineers have been retained to complete plans for construction of treatment plant and sewerage system estimated to cost \$90,000. Plans include the installation of 21,000 ft. of mains, sewage lift station and treatment plant.

TOPPENISH: Engineer has been retained to make preliminary plans for construction of adequate drainage and storm sewers and construction of treatment plant. Estimated cost, \$425,000.

TWISP: Engineer has been employed to prepare preliminary plans for sewerage system and modern sewage disposal plant estimated to cost \$104,000.

UNION GAP: Engineer has been retained to make a comprehensive study

(Continued on page 119)

California Postwar Backlog

THE CALIFORNIA STATE Reconstruction and Reemployment Commission was established in 1943 as the state's contribution to the meeting of any postwar unemployment problems. Col. Alexander Heron was chosen to head the commission and numerous reports of research carried out under his direction have been issued.

The latest and most revealing of these reports was published last month, entitled "Study of Timing of Public Works in California." The following is a summary of the contents of the report, with charts showing type, location and cost of the work planned for 1946. Space does not permit publishing similar charts for the work anticipated for the years 1947-48, but they can be secured from the report.

Summary

A total of \$1,123,601,754 of public works has been tentatively scheduled for start of construction in California during the three years 1946-1948 by local, state and federal agencies. Working plans and specifications are far enough along so that construction could start as now scheduled. Most of these projects represent urgently needed improvements.

Of this total, projects proposed by local public agencies are estimated at \$552,094,030 (49.1 per cent); state projects amount to \$295,740,234 (26.3 per cent); and federal flood control and irrigation works account for \$275,767,490 (24.6 per cent).

Funds reported to be available on December 31, 1945, for construction of the \$552,094,030 of projects proposed by local public agencies in California are estimated at \$264,559,508. Of these funds available, \$130,877,084, or 49 per cent, are for projects scheduled by California cities.

California counties report funds available of \$78,238,194 (29.3 per cent of all funds reported). School districts have

State Reconstruction and Rehabilitation Commission charts timing for over a billion dollars of public construction work to be performed in California during the ensuing three years—Los Angeles County has largest program, and flood control and irrigation works lead in type of construction to be undertaken

\$39,360,460 available for their projects during the three-year period.

Funds actually available or in sight for local projects in California probably exceed these reported amounts.

Funds estimated to be available during the period June 30, 1945-June 30, 1948, for state highway improvements amount to \$119,000,000. Not more than \$12,468,520 were available December 31, 1945, for state building projects. Unappropriated funds in the State Postwar Employment Reserve and the Postwar Unemployment and Construction Fund are estimated at \$234,007,345.

Every county of the state would share to some extent in the projects scheduled to start during the three years 1946-1948. The largest amount of work would be in Los Angeles County, which would have 31 per cent of the total. The remainder is well distributed among the various counties.

Flood control and irrigation projects totaling \$354,192,457 are the largest single type of work scheduled. Highway, road and street projects, sewage disposal and storm drain projects, and schools and educational facilities rank next in the order named among the 14 types of improvements classified in the report. These four largest groups account for 72.4 per cent of the estimated cost of all projects reported here to start during the three years 1946-1948.

The estimated costs and funds available for public works summarized in this report include only those projects on

which data were received by the Commission to December 31, 1945. The total of all public improvements proposed for construction during 1946-1948 is doubtless somewhat larger than the amounts reported here.

Work scheduled to start during 1946

Public works tentatively scheduled for start of construction during the year 1946 in California are estimated to cost \$577,381,397. Projects listed by local agencies to start this year amount to \$283,360,427; state projects total \$135,830,160; and federal projects account for \$158,190,810.

Funds available for local projects scheduled to start during 1946 are estimated at \$171,803,728. An additional \$88,570,625 would be needed, therefore, to cover construction of all local projects tentatively scheduled to start this year.

Although a total of \$577,381,397 of public works has been tentatively scheduled to start during 1946 in California, it is extremely doubtful that such a large amount of public construction will actually be placed under contract this year because of shortages of materials, equipment and skilled workers. If this amount of public works were actually contracted for during 1946, urgently needed private construction would probably be impeded and construction costs would probably rise further.

Work scheduled to start during 1947-48

Public improvements tentatively scheduled for start of construction during the two years 1947-1948 total \$546,220,357, nearly the same as the total of projects scheduled to start during 1946.

All local projects listed for start during 1947-1948 account for \$268,733,603 of the total; state projects are estimated at \$159,910,074; federal flood control and irrigation works at \$117,576,680.

The local projects reported by the recent Federal Works Agency survey scheduled to start during 1947-1948 amount to \$247,944,829 of which \$118,451,864 is for municipal improvements. Counties rank next for work to start during these two years with \$97,334,875. Local school district projects scheduled during this period total \$26,422,920.

Funds reported as available for local projects, scheduled to start during 1947-1948, amount to \$92,755,780, leaving \$155,189,049 additional funds required.

Charts showing proposed work and funds available are on pages 103 and 104.

Bids Opened for First Construction On Gigantic Columbia Basin Project

BIDS WERE OPENED on the first construction work on the canal system of the Columbia Basin project at Coulee Dam on March 12.

The work will be done in the vicinity of Stratford and Adrian, Wash., and its major items will be approximately 1,700,000 cu. yd. of earth excavation, 340,000 cu. yd. of rock, 100,000 sta. cu. yd. of overhaul, and 300,000 cu. yd. of compacting embankments. Bids covered the furnishing of labor and material and the performing of all work for the construction of earth work on about 35,000 ft. of main canal. Some material will be furnished by the government, but most will be supplied by the contractor.

This marks the beginning of a construction program which will ultimately require, in the construction of the water-distributing system of the Columbia Basin Project, a greater number of man-hours than were expended on the construction of the Grand Coulee Dam. This construction program will, in time, bring water to 17,000 family-size farms in the million-acre, semi-arid area to be irrigated.

Three areas are to be irrigated initially. One northeast of Moses Lake, one near Quincy, and a third near Pasco, to be served by local pumping until the main canal system is extended to that section.

**SUMMARY OF ESTIMATED COST AND FUNDS AVAILABLE FOR LOCAL PUBLIC WORKS IN CALIFORNIA
TENTATIVELY SCHEDULED FOR CONSTRUCTION DURING 1946**

COUNTY	COUNTIES		CITIES		SCHOOL DISTRICTS		OTHER		TOTAL	
	Cost of projects	Additional funds available	Cost of projects required	Funds available	Cost of projects required	Funds available	Cost of projects required	Funds available	Cost of projects required	Additional funds required
Alameda	\$ 2,228,100	\$ 1,114,050	\$ 1,711,804	\$ 1,613,900	\$ 117,904	\$ 6,643,000	\$ 5,710,000	\$ 5,537,000	\$ 16,312,904	\$ 14,735,950
Alpine	227,000	10,000	217,000	86,000	35,000	51,000	222,000	222,000	45,000	1,576,954
Anador										268,000
Butte										249,919
Calaveras	200,000	60,000	140,000	140,000	99,670	200,000	85,451	114,549	55,900	192,000
Colusa										254,000
Contra Costa	350,500	125,000	225,500	1,749,500	897,000	2,238,818	319,318	1,919,500	35,700	3,042,000
Del Norte										3,333,818
El Dorado										3,333,818
Fresno										3,333,818
Glenn	404,600	305,000	98,600	24,355	24,355	304,500	135,000	135,000	37,000	4,375,818
Humboldt										4,375,818
Imperial	159,000	65,500	93,500	411,500	107,000	168,650	588,000	350,000	100,000	524,955
Inyo										429,355
Kern	143,000	143,000	2,345,600	920,350	1,425,250	2,572,736	857,333	1,715,403	970,000	10,000
Kings	140,000	140,000	234,000	234,000	40,000	40,000	40,000	40,000	790,000	6,031,336
Lake										2,100,683
Lassen										1,388,020
Los Angeles	13,648,000	7,758,820	5,889,180	66,431,862	71,049	16,748,202	99,890	64,640	679,000	918,000
Madera										918,000
Marin										918,000
Mariposa	559,279	158,928	400,351	75,000	147,680	147,680	60,000	87,680	10,000	87,680
Mendocino	1,018,750	400,000	618,750	273,355	197,705	1,361,200	234,888	27,828	20,000	607,411
Merced	320,000	160,000	160,000	160,000	197,705	234,888	535,500	827,700	2,010,000	2,654,155
Modoc										2,011,150
Mono										188,000
Monterey	700,000	174,000	526,000	201,000	24,000	160,000	73,000	87,000	1,061,000	637,000
Napa										713,470
Nevada	56,000	56,000	10,500	8,000	10,500	10,500	1,301,470	660,000	641,470	1,146,500
Orange	406,000	161,000	245,000	1,578,050	391,600	1,186,450	500,500	2,531,000	1,080,000	641,050
Placer										2,447,600
Plumas	479,000	300,000	170,000	450,000	40,000	2,540,000	20,000	5,500	21,000	231,000
Riverside										231,000
Sacramento	1,301,000	1,000,000	301,000	2,544,000	2,458,470	2,252,370	206,100	1,063,200	414,000	495,500
San Benito	150,000	150,000	150,000	81,000	81,000	81,000	234,000	500,500	266,500	1,518,200
San Bernardino	1,085,000	120,000	965,000	227,150	212,400	14,750	990,000	844,000	1,664,440	1,450,000
San Diego	46,000	46,000	300,000	170,000	450,000	450,000	36,131,000	33,937,000	2,194,000	1,655,500
San Francisco										2,194,000
San Joaquin	43,077	3,000	40,077	2,458,470	2,458,470	2,458,470	206,100	931,750	805,880	125,870
San Luis Obispo	67,200	16,800	50,400	573,000	300,400	272,600	67,900	3,143,000	592,600	33,950
San Mateo										84,350
Santa Barbara	393,000	188,000	205,000	266,650	169,500	97,150	1,343,000	1,343,000	750,400	2,309,000
Santa Clara	392,500	392,500	82,565	2,438,000	319,250	2,438,000	2,438,000	319,250	447,580	75,900
Santa Cruz	137,000	54,435	54,435	2,438,000	125,000	125,000	125,000	125,000	125,000	2,885,580
Shasta										2,885,580
Sierra	142,000	30,000	112,000	34,900	81,400	66,000	60,000	60,000	6,000	30,000
Siskiyou	93,000	23,250	69,750	116,300	79,000	1,207,200	1,207,200	1,207,200	10,000	112,000
Solano	1,282,920	780,411	502,509	126,400	136,400	13,000	113,000	1,000	10,000	118,150
Sonoma	172,900	36,500	136,400	2,085,000	125,000	125,000	125,000	125,000	125,000	502,509
Stanislaus										502,509
Sutter										3,414,800
Tehama	184,520	65,000	119,520	34,900	81,400	66,000	60,000	60,000	10,000	61,096,600
Trinity										3,414,800
Tulare	260,000	260,000	90,250	56,250	34,000	1,137,250	229,000	908,250	10,000	119,520
Tuolumne										1,497,500
Ventura	470,000	470,000	436,700	349,200	311,000	212,000	99,000	1,800,000	1,800,000	1,202,250
Yolo										1,202,250
Yuba										1,202,250
TOTALS	\$ 27,826,996	\$ 13,386,052	\$ 14,440,944	\$ 106,598,694	\$ 141,363,105	\$ 14,798,820	\$ 15,956,782	\$ 15,965,270	\$ 33,227,470	\$ 171,803,728
										\$ 260,374,353

**SUMMARY OF ESTIMATED COST OF LOCAL PUBLIC WORKS IN CALIFORNIA
TENTATIVELY SCHEDULED FOR CONSTRUCTION DURING 1946**

COUNTIES	Highways, roads and streets	Sewage and storm drains	Water supply and distribution	Schools and educational facilities	Other public buildings	Bridges and viaducts	Parks and recreation facilities	Airports	Electric power and gas	Flood control and irrigation	Hospitals	Correction facilities	Other	Total
Alameda	\$ 1,053,900	\$ 7,391,804		\$ 6,643,000		\$ 1,218,200				\$ 227,000			\$ 6,000	\$ 16,312,904
Alpine														
Amador														
Butte														
Calaveras														
Colusa														
Contra Costa														
Del Norte														
El Dorado														
Fresno														
Glenn														
Humboldt														
Imperial														
Inyo														
Kern														
Kings														
Lake														
Lassen														
Los Angeles														
Madera														
Marin														
Mariposa														
Mendocino														
Merced														
Mendocino														
Mono														
Monterey														
Napa														
Nevada														
Orange														
Placer														
Plumas														
Riverside														
Sacramento														
San Benito														
San Bernardino														
San Diego														
San Francisco														
San Joaquin														
San Luis Obispo														
San Mateo														
Santa Barbara														
Santa Clara														
Santa Cruz														
Shasta														
Sierra														
Siskiyou														
Solano														
Sonoma														
Stanislaus														
Sutter														
Tehama														
Trinity														
Tulare														
Tuolumne														
Ventura														
Yolo														
Yuba														
TOTALS	\$18,584,074	\$83,961,861		\$15,791,050	\$60,713,487	\$ 9,543,328	\$ 5,952,487	\$ 4,871,087	\$21,688,000	\$ 15,747,225	\$12,902,183	\$ 5,789,671	\$ 2,020,850	\$ 260,374,353

FPHA Attacks Home Shortage

MORE THAN 10,000 housing units for veterans of World War II are being constructed by the Federal Public Housing Authority in Region VI—Utah, Nevada, California, and Arizona—and Region VII—Idaho, Montana, Oregon, Washington, and Wyoming—as part of the \$192,000,000 emergency veterans' housing program passed by Congress.

Allocations being based on population, about 50 per cent of the housing will be located in California, the majority in Los Angeles County. Many of the units are going up on college campuses for the use of veteran students returning to school under the G. I. Bill of Rights.

Contracts negotiated

Eleven contracting firms were awarded negotiated, cost-plus, fixed-fee contracts by the FPHA central office in Washington, D. C. Amounts of the awards are contained in a large number of different proceed orders, costs of the units depending on such factors as location and type of building. Proceed orders were issued in February and construction started immediately. Work embraced in the contracts consists of moving, placing and re-adapting existing housing facilities, Army and Navy facilities, and converting barracks on sites furnished by the local communities. The FPHA has been authorized to locate and utilize all surplus government stocks available for building. Streets, water systems, sewerage and other preparations of the sites are being provided by the local bodies at their expense.

In the southern region panelizing and moving family dwelling units previously built by FPHA from localities where they are no longer needed and reconstructing them in housing shortage areas comprises about 55 per cent of the work. Thirty per cent will consist of moving and rebuilding Quonset huts, and the remaining 15 per cent will include conversion of on-site dormitories and Army barracks.

Contractors named

Under Region VI, M & K Construction Co., 200 Financial Center Bldg., San Francisco, are building nearly 800 units of all types in Utah, Nevada and California north of Sacramento. Robert J. McCarthy, 1050 Kirkham St., San Francisco, is responsible for construction of 750 dwelling units from San Francisco south through Santa Barbara, Calif. Six hundred of these will be dwellings moved to Highways 99 and 101 from housing projects in Richmond and Vallejo, Calif.

Baruch Corporation, 625 S. Olive St., Los Angeles, is erecting 750 Quonset huts containing 1,500 units on one site in Griffith Park, Los Angeles, for \$3,081,000. Daley Brothers, 426 Bryant St., San Francisco, is constructing 1,450 family units moved from Port Orchard, Wash., and Vanport, Ore., Region VII, Seattle area of the FPHA, to Los Angeles and



UNDER CONSTRUCTION at Richmond, Calif., four years ago, the dormitories, top, are being moved to Highways 99 and 101 between San Francisco and Santa Barbara. Family dwellings at Happy Camp, bottom, built during the war emergency by FPHA in Northern California mining country, are some of those being demounted, moved and rebuilt in communities most in need of housing for families of returned veterans.

adjacent counties. William Crowell, 170 East California St., Pasadena, is converting 220 units in Army barracks on their sites in Long Beach, Calif.

Schumaker & Evans Construction Co., 4007 West 6th St., Los Angeles, is constructing 750 units south and east of Los Angeles, including San Bernardino, Imperial and Riverside Counties, as well as the city of Bakersfield. This work consists of movement of dormitories and on-site conversion of Army barracks, plus erection of some Quonset huts. Del E. Webb Construction Co., Box 4066, Phoenix, Ariz., is moving dor-

mitories and erecting Quonset huts, giving a total of approximately 500 dwelling units throughout the state of Arizona.

Northwest contractors

In the Northwest region the total number of units assigned now amounts to 2,959 family dwelling units, 132 trailers and 1,230 dormitory units, which exhausts the quota for that region. Contractors Nettleton & Baldwin, 1109 N. 36th St., Seattle, are handling the dismantling and moving of the temporary war housing in the state of Washington. Wick & Dahlgren, 2016 30th S., Seattle, is operating in the Idaho area. Lease & Leighland, 515 Vance Bldg., Seattle, is the contractor for Oregon; and Carson Construction Co., of Helena, Mont., is converting the units assigned to Montana and Wyoming.

Central construction offices for Region VI are in Los Angeles, Sacramento and San Bernardino, Calif., Salt Lake City, Utah, and Phoenix, Ariz. The Hawaiian Islands are included in Region VI, but no housing construction by FPHA is starting there yet, though the central office has released plans for 1,700 more dwelling units in Region VI, with 300 of them slated for Honolulu. Region VII includes Alaska, which will soon receive some units reserved for it.

Eleven Western contractors received contracts and have started to work on the first phase of FPHA's vast program of providing homes to married and unmarried veterans throughout California, Arizona, Nevada, Utah, Oregon, Washington, Idaho, Montana and Wyoming

Under contracts with the local public agencies, title to the building is acquired by the community furnishing the site. The contract is for two years, and, at the option of the government, if conditions require, may be extended. The veteran tenants will rent from the communities. The housing units will function as long as the need for them exists, after which time they will be removed by the local communities, according to agreement with the FPHA. The family dwellings are two-story, six- or eight-family units, or one-story, four-family units. The veteran dormitories consist of one- and two-bedroom units, with the latter predominating. The number of bedrooms in family units ranges from one to three, though generally two.

Average expenditures

An average of \$1,800 is spent for conversion of each dwelling unit. It will cost from \$1,326 to \$1,350 per unit to alter dormitories in their present locations. The cost per unit of demounting, moving and re-erecting temporary houses will run from \$1,472 to \$1,500. To demount, move and re-erect dormitories it will cost from \$1,866 to \$1,900 per unit. On-site alteration of Army barracks will cost from \$1,915 to \$1,950 per unit; and moving a Quonset hut will cost from \$2,050 to \$2,250.

The number and type of dwelling units each municipality and educational institution will receive, and the contractor doing the work is as follows:

In Northern California: Madera Co., 28 units, movement and conversion of dormitories, by McCarthy; Sacramento, 185 units, movement and conversion of dormitories, by M & K; Davis, 20 units, movement and conversion of dormitories, by M & K; Salinas, 32 units, movement and conversion of dormitories, by McCarthy; Duncsmuir, 10 units, on-site conversion, by M & K; Tulare Co., 75 units, movement and conversion of dormitories, by McCarthy; San Joaquin Co., 125 units, movement and conversion of dormitories, by McCarthy; Glenn Co., 20 units, movement of temporary dormitories, by M & K; Yreka, 16 units, movement of temporary dormitories, by M & K; Fresno, 100 units, on-site conversion of barracks, by McCarthy; and Monterey, 20 units, movement and conversion of dormitories, by McCarthy.

Modesto Board of Education, 35 units, movement and conversion of dormitories, by McCarthy; Santa Rosa Jr. College, 26 units, movement and conversion of dormitories, by McCarthy; San Francisco Jr. College, 50 units, Quonset huts from San Bruno, by McCarthy; San Mateo Jr. College, 25 units, movement and conversion of dormitories, by McCarthy; San Jose State College, 50 units, movement and conversion of dormitories, by McCarthy; Univ. of Calif. at Davis, 40 units, movement and conversion of dormitories, by M & K; Stanford Univ., in Palo Alto, 100 units, Quonset huts from San Bruno, by McCarthy; Humboldt State College, Arcata, 24 units, on-site conversion of barracks, by M & K; Fresno State College, 73 units, movement of dormitories, by McCarthy.

Southern California

In Southern California exclusive of Los Angeles County: Santa Barbara, 27 units, on-site conversion of barracks, eight Quonset huts from Port Hueneme, by McCarthy; Calexico, 10 units, movement of temporary dormitories, Schumaker & Evans; Holtville, 10 units, movement of temporary dormitories, Schumaker & Evans; Brawley, 20 units, movement of temporary dormitories, Schumaker & Evans; El Centro, 20 units, movement of temporary dormitories, Schumaker & Evans; Bishop, 20 units, movement of temporary dormitories, M & K; Santa Ana, 60 units, on-site conversion of barracks, by Schumaker & Evans; Redlands, 20 units, movement of temporary dormitories from Washington, by Daley; San Bernardino, 164 units, on-site conversion of barracks, by Schumaker & Evans; Ventura, 25 units, movement of temporary dormitories from Washington, by Daley; Anaheim, 30 units, movement of temporary dormitories from Washington, by Daley; Riverside Co., 50 units, movement of temporary dormitories from Washington, 50 units, on-site conversion of barracks, by Daley; Kern Co., 76 units, on-site conversion of barracks, by Schumaker & Evans; Univ. of Redlands, 30 units, movement of temporary dormitories from Washington, by Daley; La Sierra College, Arlington, 20 units, movement of temporary dormitories from Washington, by Daley; Fullerton Jr. College, 25 units, movement of temporary dormitories from Washington, by Daley; Univ. of Calif. at Santa Barbara, 35 units, Quonset huts from Port Hueneme, by McCarthy; and College of Medical Evangelists, Loma Linda, 10 units, Quonset huts from Port Hueneme, by Schumaker & Evans.

Los Angeles County

Los Angeles, 1,500 units, Quonset huts from Port Hueneme, by Baruch; Long Beach, 220 units, on-site conversion of barracks, by Crowell; Glendale, 100 units, movement of temporary dormitories from Washington, by Daley; Alhambra, 75 units, movement of temporary dormitories from Washington, by Daley; Burbank, 25 units, movement of temporary dormitories from Washington, 55 units, on-site conversion of barracks, by Daley; Culver City, 50 units, movement of temporary dormitories from Washington, by Daley; Santa Monica, 47 units, movement of temporary dormitories from Washington, 53 units, on-site conversion of barracks, by Daley; Whittier, 50 units, Quonset huts from Port Hueneme, by Schumaker & Evans; South Gate, 50 units, movement of temporary dormitories, by Daley; Inglewood, 75 units, movement of temporary dormitories, by Daley; Hawthorne, 25 units, movement of temporary dormitories from Washington, by Daley; Los Angeles Co., 200 units, movement of temporary dormitories from Washington, by Daley; Lynwood, 15 units, Quonset huts from Port Hueneme, by Schumaker & Evans; Los Angeles, 100 trailer units moved, contractor undecided.

Univ. of Calif. at Los Angeles, 200 units, movement of temporary dormi-

tories from Oregon, by Daley; Occidental College, Los Angeles, 25 units, temporary dormitories moved from Oregon, by Daley; Compton Jr. College, 30 units, movement of temporary dormitories from Washington, by Daley; Pomona College, Claremont, 35 units, movement of temporary dormitories from Washington, by Daley; Whittier College, 20 Quonset huts from Port Hueneme, by Schumaker & Evans; Geo. Pepperdine College, Los Angeles, 40 units, Quonset huts from Port Hueneme, by Schumaker & Evans; and at Univ. of So. Calif., 200 units, 30 in movement of temporary dormitories from Washington, 60 in movement of temporary dormitories from Oregon, 50 in movement of temporary dormitories from California, and 60 units in Quonset huts from Port Hueneme, by Schumaker & Evans.

Mountain states

In Arizona all conversion will be done by Del Webb: Phoenix, 150 units, movement of temporary dormitory units; Tucson, 64 units, movement of temporary dormitories, 6 trailers; Winslow, 50 units, movement of temporary dormitories; Casa Grande, 20 units, movement of temporary dormitories; Yuma Co., 25 units, movement of temporary dormitories; Maricopa Co., 30 units, movement of temporary dormitories; Coolidge, 20 units, movement of temporary dormitories; Univ. of Ariz., Tucson, 20 units, movement of temporary dormitories, 56 units, Quonset huts; and Ariz. State College, Tempe, 81 units, movement of dormitories, 19 units, conversion on-site.

In Utah: Salt Lake City, 125 units, on-site conversion of an Army hospital; Logan, 20 units, movement of temporary dormitories; Carbon College, Price, 10 units, movement of temporary dormitories from Nevada; Univ. of Utah, Salt Lake City, 178 units, movement of temporary dormitories from Nevada; Snow College, Ephraim, 6 units, movement of temporary dormitories; and Utah State Ag. College, Logan, 50 units, movement of temporary dormitories, all by M & K.

In Nevada: Carson City, 24 units, movement of temporary dormitories; Winnemucca, 20 units, movement of temporary dormitories; Lovelock, 14 units, movement of temporary dormitories; and Univ. of Nevada, Reno, 36 trailer units, all by M & K.

Northwest area

In Washington, all conversion done by Nettleton & Baldwin: Hoquiam, 24 family dwelling units; Aberdeen, 40 family dwelling units; Toppenish, 24 family dwelling units; Wenatchee, 35 family dwelling units; Grand Coulee, 25 family dwelling units; Okanogan, 10 trailers; Pateros, 10 trailers; Longview, 32 family dwelling units; Ritzville, 15 trailers; Odessa, 10 trailers; Ellensburg, 25 family dwelling units; Walla Walla and Whitman College, 40 family dwelling units; Pullman, 40 family dwelling units; Bellingham, 50 family dwelling units; Univ. of Wash., 300 family dwelling units, in addition to surplus hous-

ing already approved and moved; Wash. State College, Pullman, 386 units in dormitories, in addition to 150 family dwelling units previously approved; Seattle Pacific College, 25 family dwelling units; Eastern Wash. College of Education, Cheney, 15 trailers; Central Wash. College of Education, Ellensburg, 25 family dwelling units; Western Wash. College of Education, Bellingham, 30 family dwelling units; and St. Martins College, Lacey, 10 trailers.

In Oregon, where all building will be done by Lease & Leighland: Pendleton, 30 family dwelling units; Grants Pass, 24 family dwelling units; Tillamook, 24 family dwelling units; Medford, 32 family dwelling units; Nyssa, 15 trailers; Arlington, 10 trailers; Salem, 60 family dwelling units; Ontario, 25 family dwelling units; The Dalles, 25 family dwelling units; Corvallis, 30 family dwelling units; Hood River, 25 family dwelling units; Cottage Grove, 25 family dwelling units; Coos Bay, 24 family dwelling units; Madras, 10 trailers; Albany, 25 family dwelling units.

Pacific College and city of Newberg, 24 family dwelling units; Willamette Univ., 30 family dwelling units, in addition to 30 previous ones; Univ. of Oregon, Eugene, 386 units in dormitories and 24 family dwelling units; Oregon State College, Corvallis, 386 units in dormitories and 50 family dwelling units; Linfield College, McMinnville, 25 family dwelling units; Pacific Univ., Forest Grove, 25 family dwelling units; Oregon College of Education, Monmouth, 25 family dwelling units.

In Montana, under contract to Carson Construction Co.: Wolf Point, 24 family dwelling units; Great Falls, 50 family dwelling units; Missoula, 50 family dwelling units; Miles City, 30 family dwelling units; Montana State College, Bozeman, 15 family dwelling units, in addition to 60 previously approved; Montana School of Mines, Butte, 25 family dwelling units; Montana State Univ., Missoula, 24 family dwelling units, in addition to 100 previously approved; Billings Polytechnic Institute, 35 family dwelling units; and Northern Montana College, Havre, 25 family dwelling units.

In Idaho, where Wick & Dahlgren are building: Lewiston, 24 family dwelling units; Wallace, 24 family dwelling units; Burley, 24 family dwelling units; Kellogg, 50 family dwelling units; Pocatello, 38 family dwelling units; Caldwell, 28 family dwelling units; Boise, 50 family dwelling units; Weiser, 25 family dwelling units; Grangeville, 25 family dwelling units; Idaho Falls, 35 family dwelling units; Moscow, 25 family dwelling units; Twin Falls, 30 family dwelling units.

Lewiston State Normal, 12 trailers, in addition to 25 family dwelling units previously approved; Univ. of Idaho, Southern Branch, Pocatello, 30 family dwelling units, in addition to 40 previously approved; College of Idaho, Caldwell, 10 family dwelling units; Albion State Normal, 15 trailers; Boise Jr. College, 24 family dwelling units; Ricks College and city of Rexburg, 25 family dwelling units; Northwest Nazarene College, Nampa, 25 family dwelling



DURABLE QUONSET huts comprise a good proportion of housing units being demounted, moved, reconstructed and converted, especially in Los Angeles County area.

units; and Univ. of Idaho, Moscow, 80 family dwelling units.

In Wyoming, also under contract to Carson Construction Co.: Rock Springs, 30 family dwelling units; Laramie, 30 family dwelling units; Sheridan, 30 family dwelling units; Casper, 38 family dwelling units; Cody, 24 family dwelling units; Riverton, 25 family dwelling units; Thermopolis, 25 family dwelling units; Worland, 25 family dwelling units; and Univ. of Wyoming, Laramie, 72 units in dormitories, in addition to 80 family dwelling units previously approved.

Private building

Construction is expected to be speeded up on veteran housing which is financed privately or with loans from the Federal Housing Administration, under the Civil Production Administration's HH priority rating system, which is drastically curtailing commercial and industrial building and will limit the use of building materials to government-approved projects.

Handled by the FHA, the HH series provides a priority on building materials to veterans in need of housing. Any veteran with priority has a very good chance of obtaining the necessary materials for construction, whereas it is becoming almost impossible for home and commercial builders without priority ratings to get materials.

A building contractor may get a preference rating if he agrees to hold his houses for 30 days after completion for sale or rent to a veteran, after which time he may sell to anyone. During construction and 30 days after, a sign announcing that a house is open to a veteran must be prominently displayed. FHA sets the rent and sales price.

FHA officials in San Francisco declared that more than 50 per cent of current housing construction is not financed through FHA loans, though their offices are swamped with priority applications. Anybody may get FHA loans, up to a maximum of \$16,000. The main requirement is that FHA approve the land and house plans.

Federal Housing Administrator Wilson W. Wyatt announced from Washington, D. C., that most of the building materials set aside for houses will be channeled into homes costing \$6,000 and under, and that hundreds of "action men" will roam the nation to speed the government's housing program. He said he expected aircraft factories and other unused war plants to be used extensively in mass production of prefabricated homes, the Reconstruction Finance Corporation guaranteeing a market for the makers.

Two Los Angeles Firms Given Canal Contract

THE CHIEF ENGINEER of the Bureau of Reclamation has awarded a \$1,228,841 contract for construction work on a ten-mile section of the 145-mi. Coachella irrigation canal in Southern California to J. F. Shea Co. and Morrison-Knudsen Co., Inc., both of Los Angeles, according to E. A. Moritz, Director of the Bureau's Region III office at Boulder City, Nev.

Eighty-four miles of the Coachella Canal have been completed and approximately 11 mi. are under construction. The new contract covers earthwork, concrete lining, and structures for an additional 10 mi. due east of Indio, Calif. The Bureau expects to advertise for bids for additional mileage in the near future.

The Coachella Canal is a branch of the 80-mi. All-American Canal completed by the Bureau of Reclamation in 1940. With an initial capacity of 15,155 sec. ft., the All-American is the largest man-made river in the United States. It now provides irrigation water for 400,000 ac. in the Imperial Valley.

The Coachella Canal, designed for an initial capacity of 2,500 sec. ft., will irrigate approximately 75,000 ac. in the Coachella Valley, north of the Salton Sea. Water for the All-American canal system is diverted from the Colorado River by Imperial Dam, about 18 mi. upstream from Yuma, Ariz.

Cliff Slides Onto Highway

THE WORST SLIDE in the recorded history of the Columbia River gorge, through which passes the scenic Columbia River highway and the tracks of the Union Pacific Railroad east from Portland, started on Feb. 4th after a long period of intense rain. The slide occurred about one-half mile east of Multnomah Falls, and an estimated 350,000 cu. yd. of material catapulted down the steep slope and onto the highway and railroad. In addition, underground cables of the Pacific Tel. & Tel. Co. and local power lines were destroyed. The telephone lines included the Seattle-Salt Lake City trunks.

Traffic was restored after about a week's work by a large crew of men from the Highway Department, the railroad and other agencies. Bulldozers and other mechanical equipment were used in removal of the accumulated debris.

The slide started Monday noon, Feb. 4th, as a minor mound of dirt across the highway, and road crews thought they could clear it away with little trouble. But at 6:30 that evening, with an ominous rumble, the hillside seemed to

Part of Oregon's Columbia River highway and railroad tracks covered by streams of mud, rocks and trees which several times catapulted from mountainside after long rains
—Road crews rushed to clear debris and stop further sliding

break away and a 200-ft. stream of mud, rock and trees tumbled over the highway and railway tracks below. Lesser slides hampered men who worked day and night with dozer equipped tractors pushing the piles of mud and rock toward the Columbia River.

Second slide

A second huge slide, which workmen said "sounded like a volcano and went down like an express train," came 48

About 350,000 cu. yd. of earth crashed log barriers near Multnomah Falls. Tractors push muddy debris toward Columbia River.

hours later, bringing the total yardage of mud forced over the highway to about 350,000 cu. yd. W. C. Williams, Oregon Highway Department district engineer, estimated that 100,000 tons of rock and debris cascaded from the mountainside onto the highway and railway tracks in two days.

Two telephone linemen were at work splicing cables under a tent when the second great slide began. They ran for safety, but their equipment and the tent were buried under the river of mud and rock. A tractor was caught and almost covered by the muck before a road of timbers could be laid to rescue it.

The lava-like flow cut away more than 1,000 ft. of new highway fill, being made for the relocation of U. S. 30, and pushed its way out into the Columbia River, uprooting a dike of piles and a navigation dolphin and shoving the whole structure out into the channel in an island formation.

Huge bulldozers and big power shovels worked to clear the railway tracks and keep the slide moving out into the river while other tractors endeavored to



cut through the slide to clear the highway. The job of stopping the mountain from further sliding was tackled by the Oregon Highway Department. A 2-cu. yd. power shovel and high-speed earth-moving units were rushed from the Troutdale area by Leonard and Slate, Portland contractors, who were at work on the new U. S. 30 Highway. The equipment was moved across the slide and up an old road into the huge canyon above the highway and put to work at relieving the pressure.

"We plan to clean the loose rock out of the pit and then restore the log dike up there to prevent any more of the mountain from pouring down onto the highway," officials stated. A temporary log bridge was built across the slide chasm to serve as a by-pass for highway traffic.

This report of the slide and the accompanying photographs were furnished by Jack Harger of the Caterpillar Tractor Co.

Bids for Cascade Dam Open March 21 in Boise

THE BUREAU OF RECLAMATION has called for bids for the construction of Cascade Dam, near Cascade, Ida., a proposed earth and rock-fill structure which will provide a full or partial supply of irrigation water for 110,000 ac. in southwestern Idaho.

Bids for the 386,000-cu. yd. structure, to be situated on the North Fork of the Payette River, will be opened in the Regional Office of the Bureau in Boise, on March 21, it was announced. When completed the structure will be 80 ft. high above the stream bed, have a crest length of 800 ft. and a storage capacity of about 700,000 ac. ft.

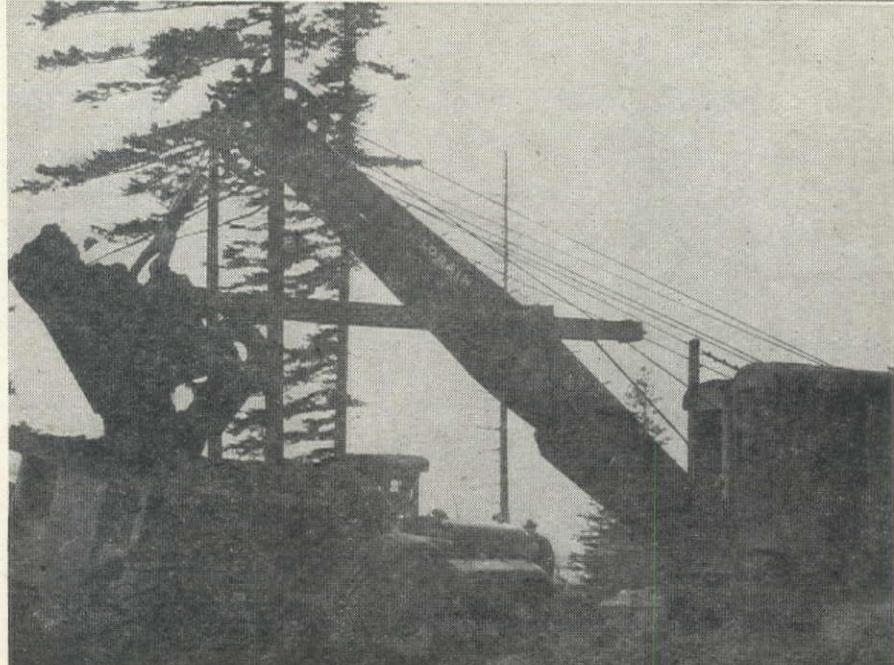
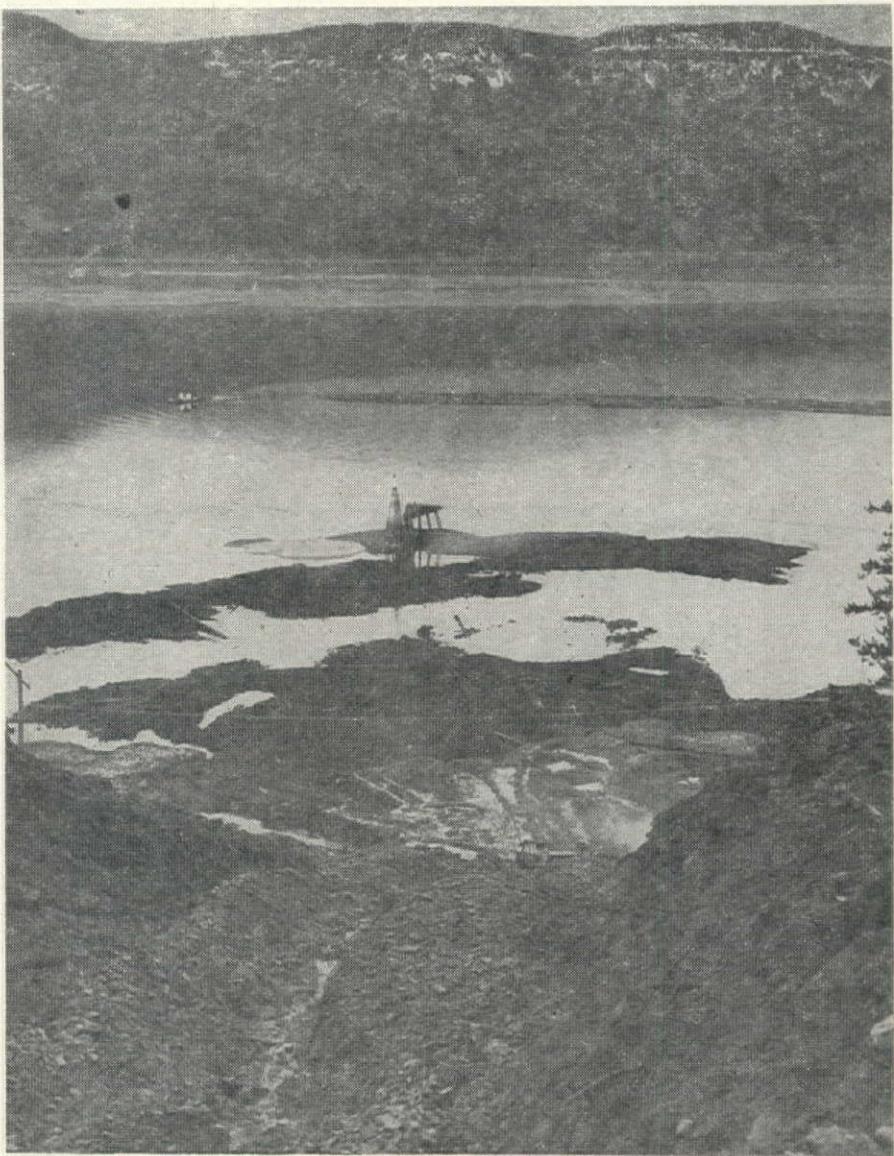
The reservoir will provide a full supply of water for 25,000 ac. of land near New Plymouth and Middleton on Payette Division of the Boise Project and a supplemental supply for 85,000 ac. in the Emmett Valley which suffers periodic shortages.

Bids are also to be called for this spring for several additional items of work, including the relocation of 11½ mi. of state highway between the towns of Cascade and Donnelly, and construction of 45 mi. of branch canal and approximately 250 mi. of laterals and of a pumping plant with a capacity of 500 cu. ft. per sec.

The Bureau opened bids on Feb. 28 for completing the relocation of 14 mi. of the McCall Branch of the Union Pacific Railroad, a portion of which will be inundated in the 7,000-ac. reservoir. One bid for clearing a small portion of the reservoir has been let and bids soon will be called for three additional tracts, embracing 1,300 ac., original bids for which were rejected.

H. B. Nicholson, Los Angeles contractor, submitted the low bid of \$454,650 for the relocation of the 14 mi. of the railroad. The only other bid submitted came from J. A. Terteling and Sons of Boise and amounted to \$464,105. Both bids were sent to the chief engineer at Denver, Colo., for action.

FROM HALFWAY up the slide may be seen the tremendous amount of earth which roared over highway and tracks toward the river, forming a tongue of land and small island. At the bottom, a Caterpillar-powered shovel works in an adjacent quarry, easing back and side pressure on the slide runway, earth from which is hauled down the slope in trucks to use as a fill for the relocation of U. S. Highway 30.



World's Largest Dam Project

ENGINEERS OF THE U. S. Bureau of Reclamation are aiding the government of China in planning development of the largest irrigation and hydroelectric power project the world has ever known. Key feature of the project, which is designed to revitalize the heavily populated, hunger-ridden, flood-menaced Yangtze valley, will be a huge dam in the gorge of the river about 300 miles east of Chungking.

The dam, as planned, will be taller than Boulder dam on the Colorado river, now the world's highest (750 ft. compared with 726). Its mass will be a third greater than Grand Coulee dam on the Columbia river, at present the world's greatest in bulk (15 million cubic yards to almost 10 million). The largest of the pyramids is dwarfed by the dam. A record 250-mi. reservoir backed up behind the dam (50-million ac. ft. capacity compared to Boulder's approximately 31 million) will store water for the mammoth irrigation project, to maintain navigation, for flood control, and for power production.

The Bureau of Reclamation is participating in the planning of the project under a contract between the government of the United States and the National Resources Commission of China. Commissioner of Reclamation Michael W. Straus has announced that work on designs and specifications is under way at the Denver headquarters of the Bureau, and that the government of China has advanced \$250,000 toward payment

Yangtze Valley of China to be site of largest irrigation, hydroelectric and navigation development in the world, with key unit a dam 750 ft. high—Ship lock would raise vessels 550 ft. with gantry crane and power stations would generate 10 million kilowatts of energy to repay the billion-dollar cost of the huge project

of the cost of the Bureau's services.

The arrangement, which was arrived at in consultation with the State Department, covers only technical studies and design work as paid for by China. Specifically, the agreement sets forth that the United States assumes no financial or other responsibility.

Hinging on construction of the dam is a comprehensive plan to rebuild the valley from the rice roots up. Within a 300-mi. range of the dam site recurrent famine and floods have devastated an area containing a population greater than that of the entire United States.

The dam will impound waters of the Yangtze to provide irrigation for 10,000,000 ac. of land, and also protect the valley against floods.

Huge power potential

Plans also call for construction of the

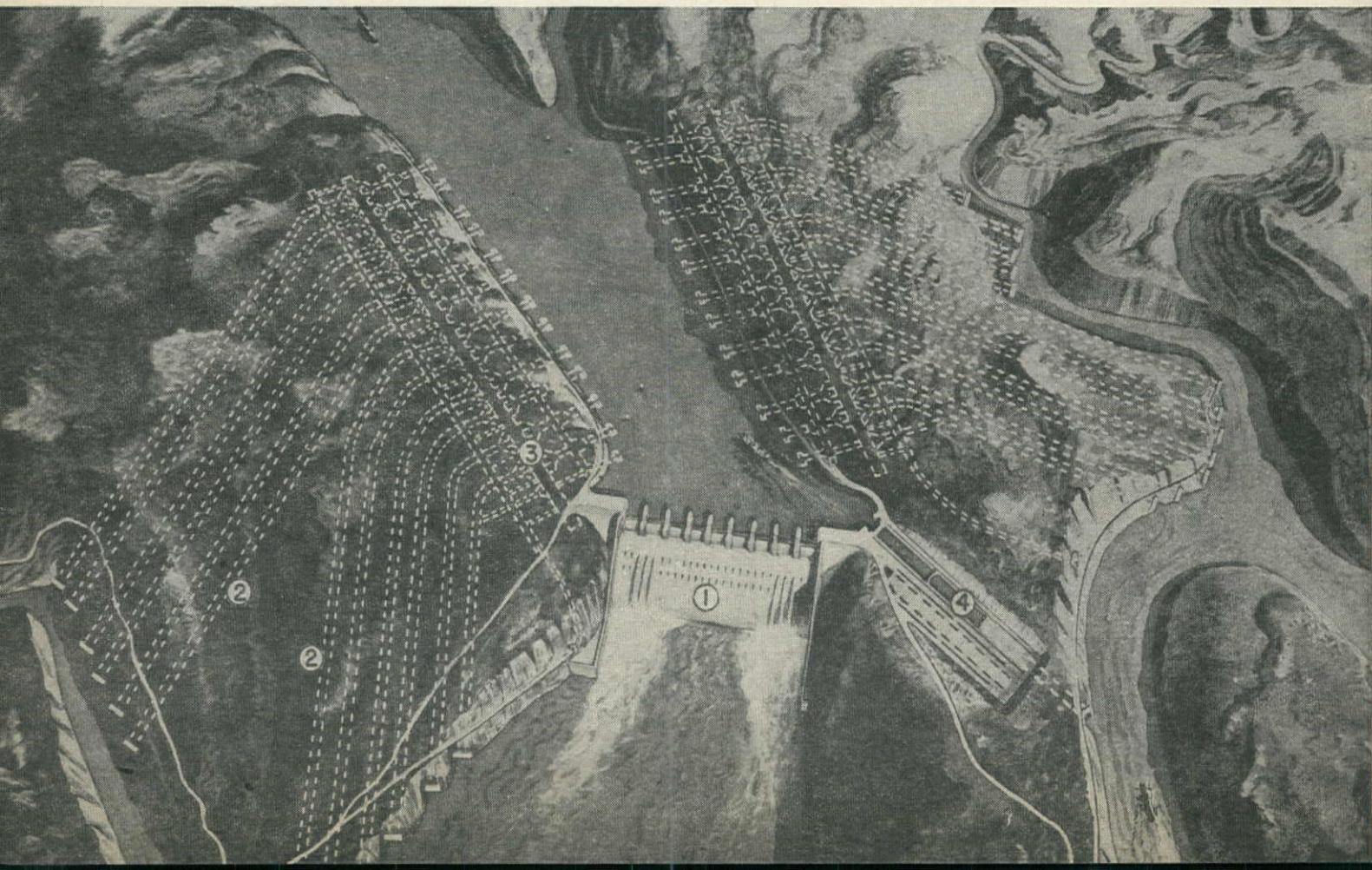
world's largest hydroelectric plant, with a generating capacity three times that of plants at Boulder, Grand Coulee, and Shasta combined.

China plans to utilize this power production to more fully develop the resources of the valley, repay the estimated billion-dollar cost of the dam, and to raise living standards in the area beyond anything previously existent. The dam will turn the flow of the Yangtze through 96 Coulee-type 108,000-kw. turbine generators nested in tunnels drilled into the solid rock walls of the gorge. All main power facilities except the switchyard will be underground.

Navigation locks

A ship-lock of revolutionary design is also under consideration as a means of getting ships past the dam. This would be a ship lift designed to raise or lower loaded ships mechanically a distance of 550 ft. Ships may also be floated through by filling and emptying locks of conventional design. The alternate method of dry-lifting ships past the dam with mammoth gantry cranes has been conceived by designing engineer John L. Savage.

A 200-ft. high tunnel through solid rock leads ships from downstream into the lock basin at river level. While the ship floats in the basin, cables from gantry cranes straddling the top of the lock are dropped down and fastened to the hull. The crane hoists the ship above the dam, moves with it along tracks until the vessel is suspended over the



navigation channel and then drops it back into the water. Ships taking this lift will have to be especially designed and built with strengthened hull and frame.

Sampans and junks will be gathered into a big corrugated metal tank and hoisted over the dam like a basket of milk bottles.

The lock gates are as revolutionary as the main lock design. Huge in size, 200 feet high, they will operate hydraulically and when closed form a perfect steel arch dam. The outlet gates of the lock basin are designed to withstand the pressure of a 530-foot column of water.

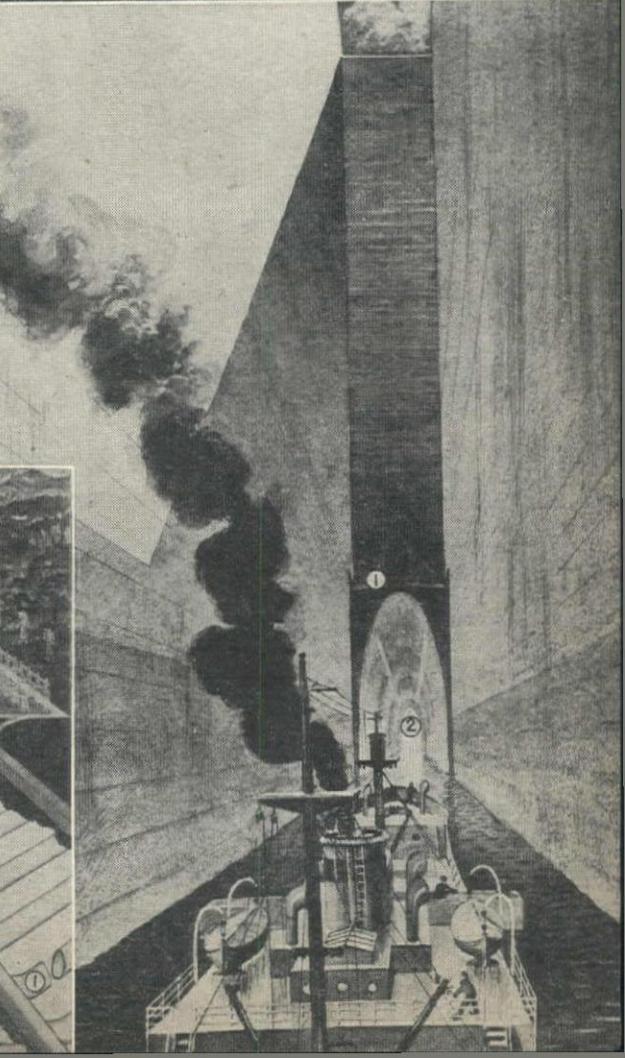
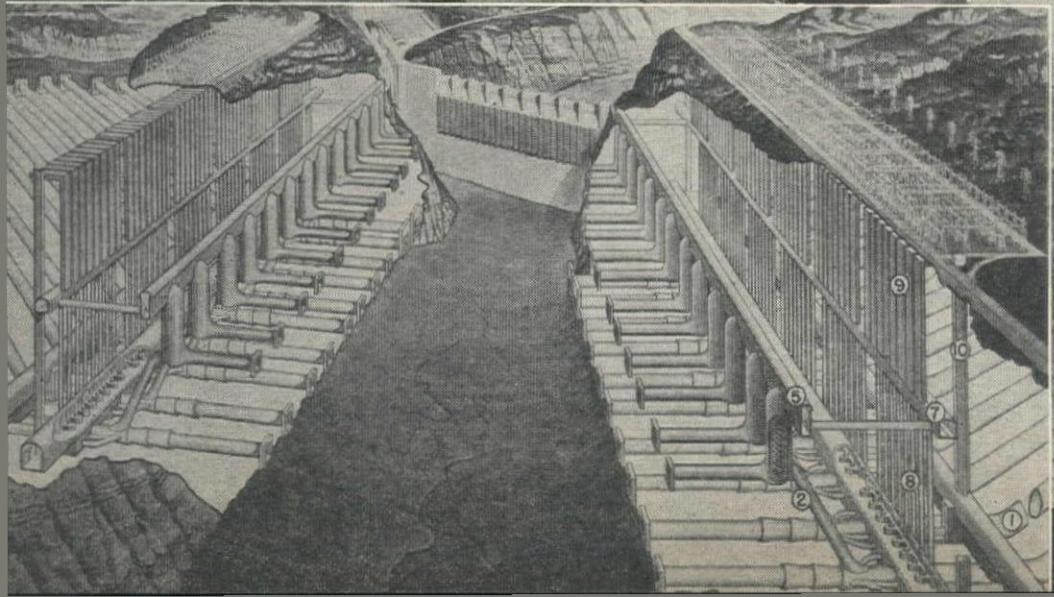
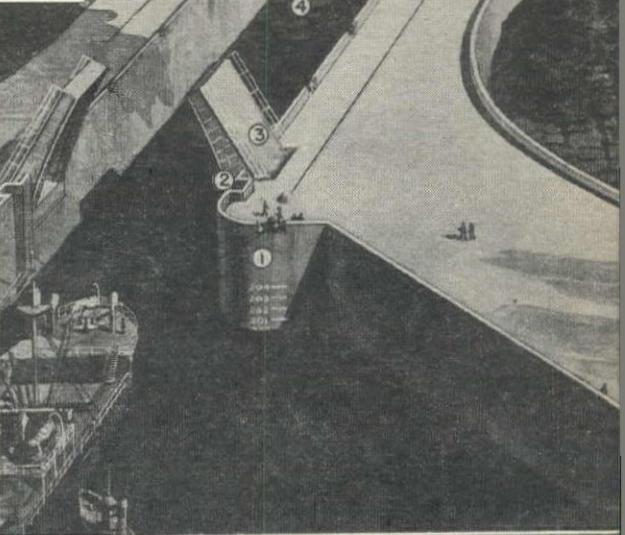
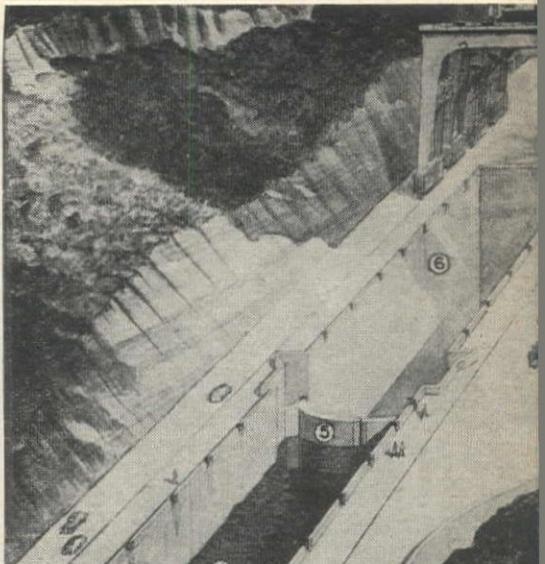
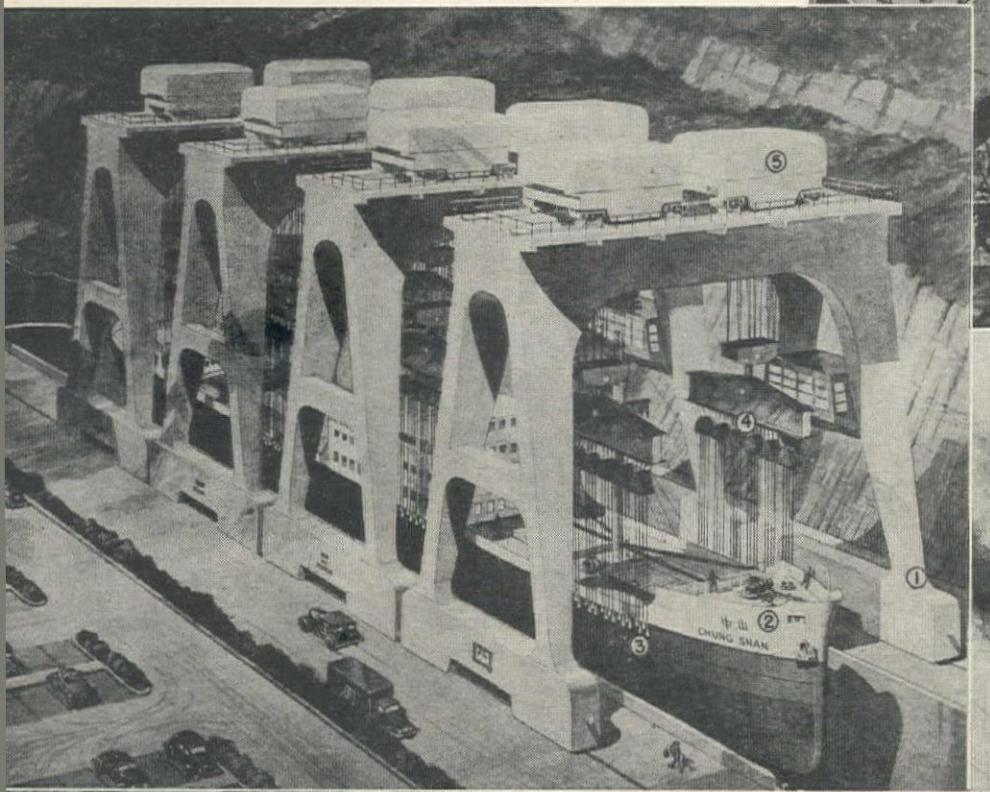
Personnel

Design and planning work is being done at the Denver office of the Bureau

of Reclamation under supervision of Chief Engineer Walker R. Young. Preliminary over-all designs were prepared by John Lucian Savage, until recently chief designing engineer of the Bureau, and world-renowned designer of Boulder, Grand Coulee, and other dams. Savage is participating in the work as consulting engineer for the Chinese government.

Chinese engineers and technicians paid by their own government are participating. The contract specifies that Bureau work in connection with domestic Reclamation projects in the United States has priority over the Yangtze Gorge project at all times, and that this country is in no way obligated to assist in either the financing or construction of the project in China.

ENGINEER'S SKETCHES of the various phases of the great Yangtze development project. On opposite page, a general plan. Top right, view looking down on the 550-ft. lift ship lock, with vessel entering at upper level. Lower right, vessel leaving at lower level, about to enter 200-ft. ship tunnel. Immediately below, the gantry crane with vessel suspended over the lower channel. Bottom, a cut-away plan of the penstocks and power facilities.



HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK

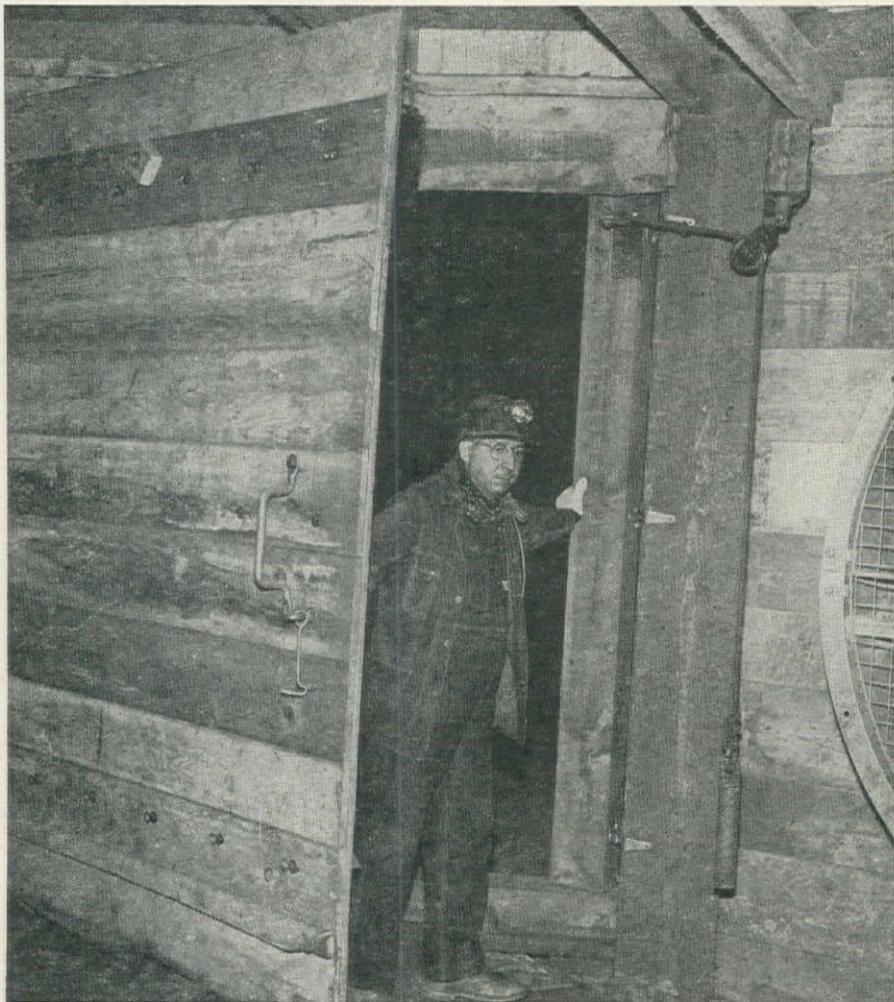
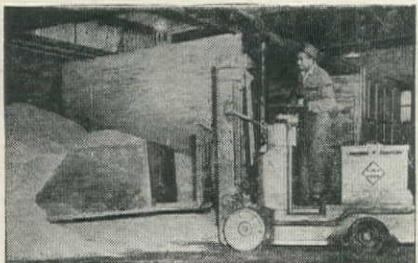


Photo by Thos. J. Barbre

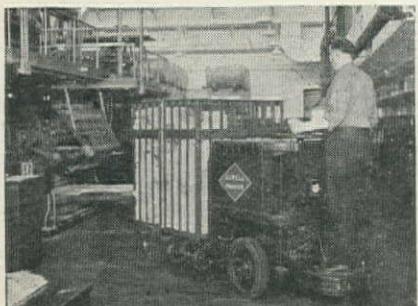
SAFETY MINE DOOR

GEORGE DUFOND, safety engineer at Sunrise Mine, Sunrise, Wyo., stands in a safety door, above. The jamb is also on hinges and is counterweighted, so it will return to place if the door is struck, preventing splintering.



MOVING LOADED CARRIERS

TRANSPORTING heavily loaded shop carriers is made easier by mounting the bed of the carrier high enough that the platform of an electric lift truck can slide under them, left. The photos from Elwell-Parker Electric Co.



ELEVATING ENDGATE

DESIGNED to load and unload heavy materials quickly with minimum of manpower, an elevating endgate for trucks has been devised by Fruehauf Trailer Co., right. It operates hydraulically, remains level throughout lift.



Improvised Loader Saves Time in Yard

THE "DOODLE BUG," as it is known in the yard of the Turlock Concrete Pipe Co., Turlock, Calif., was designed and built by J. C. Blaker and Eugene Crawford to facilitate moving, loading and transferring pre-cast concrete pipe in their yard. Illustrated on this page is the mechanical loader in action.

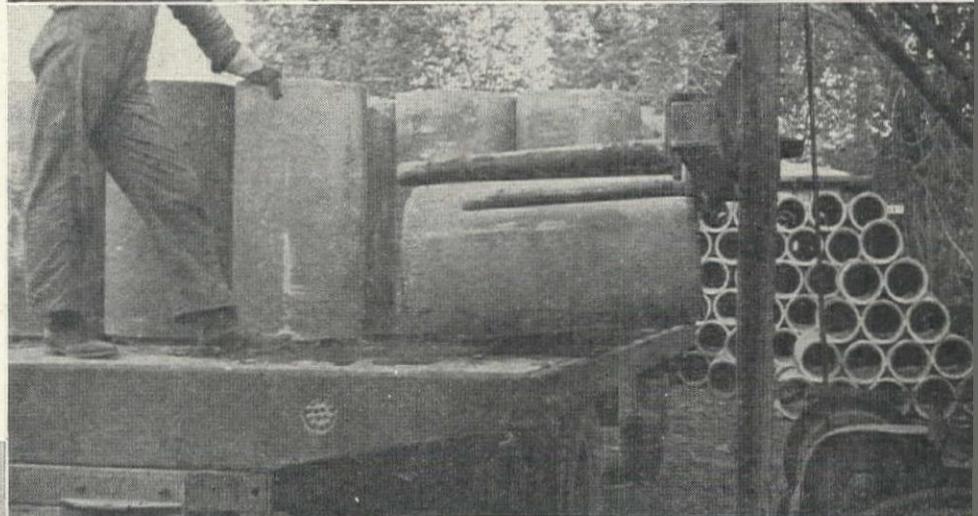
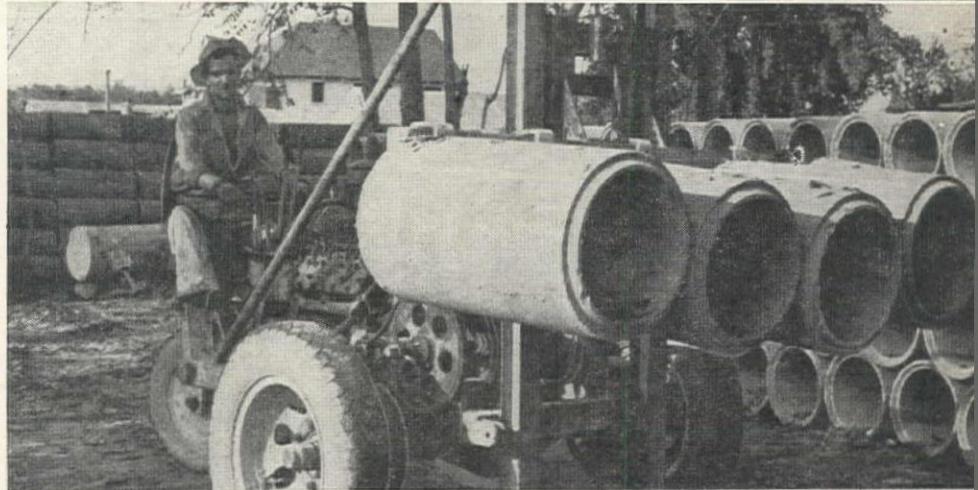
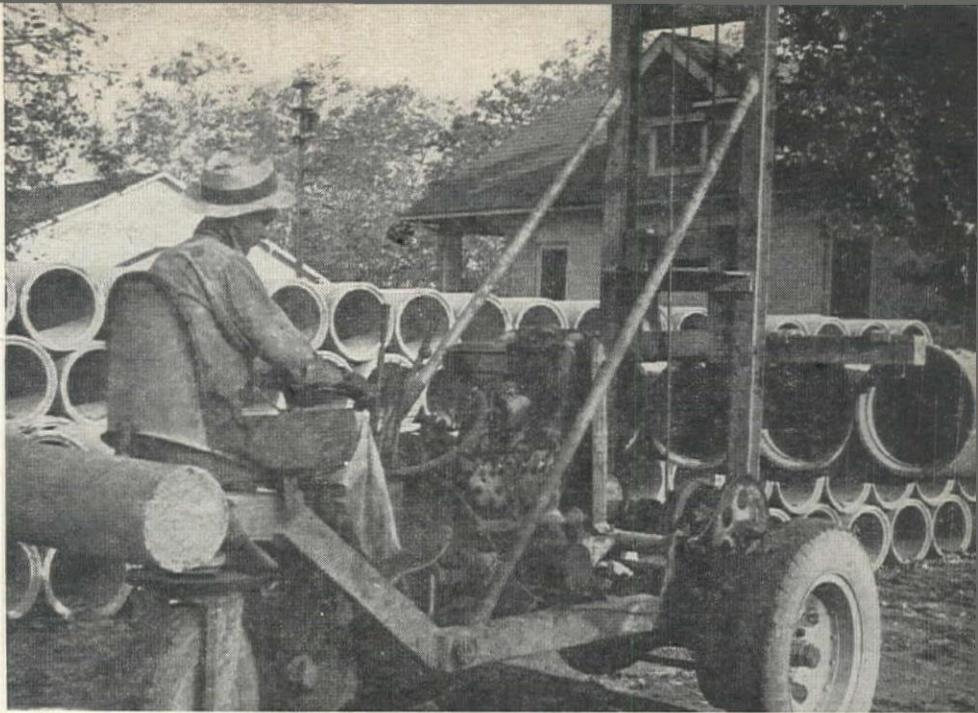
Constructed during the war from limited materials available, chiefly used auto and truck parts, this machine filled a pressing need for a mechanical loader when manpower shortages were critical. It has proven a useful time and labor saving device capable of removing much of the breakage and drudgery involved in handling pre-cast pipe.

Basically the loader is a tricycle, chain driven by a Ford V-8 motor through its transmission coupled to the propeller shaft of a truck differential slung below the motor. Contrary to its original design the truck rear end now forms the front drive of the tricycle, supporting a vertical frame in which the carrier bar tracks. Attached to the bar are several adjustable fingers used to pick up individual pipe sections. The carrier bar is controlled by a double purchase wire rope attached to the hoist drum, which is actuated by a differential gear and chain drive run from the front end of the motor shaft.

Manual control of the lift is through a vacuum actuated clutch which engages the power control drum. The load is sustained by a spring loaded brake, relieved by a separate manual control, and is automatically relieved by the forward motion of the hoist. Steering is by a sprocket and chain control of the single wheel under the operator.

It will carry approximately 2 tons or 2 36-in. diameter pipes, 3 24-in. or 4 18-in. sections. Equipped with a boom useful for placing pipe in remote locations the loader will hoist 1 ton at a 10-ft. radius.

A welding torch, some scrap pipe and a pair of used auto wheels make up the useful dolly used to trundle green pipe from the casting machine to the initial curing yard below.



news of **WESTERN** **CONSTRUCTION**

MARCH, 1946



Congressmen, Road Officials Tour Inter-American Highway

MAJ. GEN. PHILIP B. FLEMING, Federal Works Administrator, and Thos. H. MacDonald, Commissioner of Public Roads, are accompanying members of the House Roads Committee and representatives of the Corps of Engineers, the American Association of State Highway Officials, the American Road Builders Association and the Automotive Safety Foundation on a two-weeks' inspection tour of the Inter-American Highway.

Edwin W. James, chief of the Inter-American Regional Office of the Public

Roads Administration, who is in charge of arrangements for the tour, said its purpose is to enable members of the House Roads Committee and representatives of Government agencies and organizations interested in highway construction to familiarize themselves with details of the work that has been done on the Inter-American Highway.

A bill to authorize an additional appropriation of \$25,000,000 for work on the highway is now before the House Committee on Foreign Affairs and the

Senate Roads Committee.

The party will spend three days in the City of Panama, inspecting sections of the Inter-American Highway in the vicinity. Following that the group will leave by plane for David, Panama, and on the following day will fly to San Jose, capital of Costa Rica. The schedule thereafter calls for stops at Managua, capital of Nicaragua, Tegucigalpa, capital of Honduras, San Salvador and Guatemala City. Last stop will be Mexico City.

During their stay in each of the capital cities members of the party will confer with local government officials interested in the development of the Inter-American Highway and will be taken on automobile trips over sections of the highway.

In addition to General Fleming and Commissioner MacDonald, the group will include Congressman J. W. Robinson of Utah, chairman of the House Roads Committee; Congressman Albert M. Cole, Kans., J. H. McGregor, Ohio, Jennings Randolph, W. Va., Hugh Peterson, Ga. and J. Glenn Beall, Md.; E. W. James, chief of the Inter-American Regional Office of the Public Roads Administration; Pyke Johnson, president of the Automotive Safety Foundation; Charles M. Upham, executive director of the American Road Builders Association; Hal H. Hale, executive secretary of the American Association of State Highway Officials, and R. Horton Henry, special assistant in the Office of Foreign Service, Department of State.

The U. S. Corps of Army Engineers will be represented by Lieut.-Col. R. J. Haffner, Lieut.-Col. W. W. Zass and Lieut.-Col. J. M. DeBardeleben.

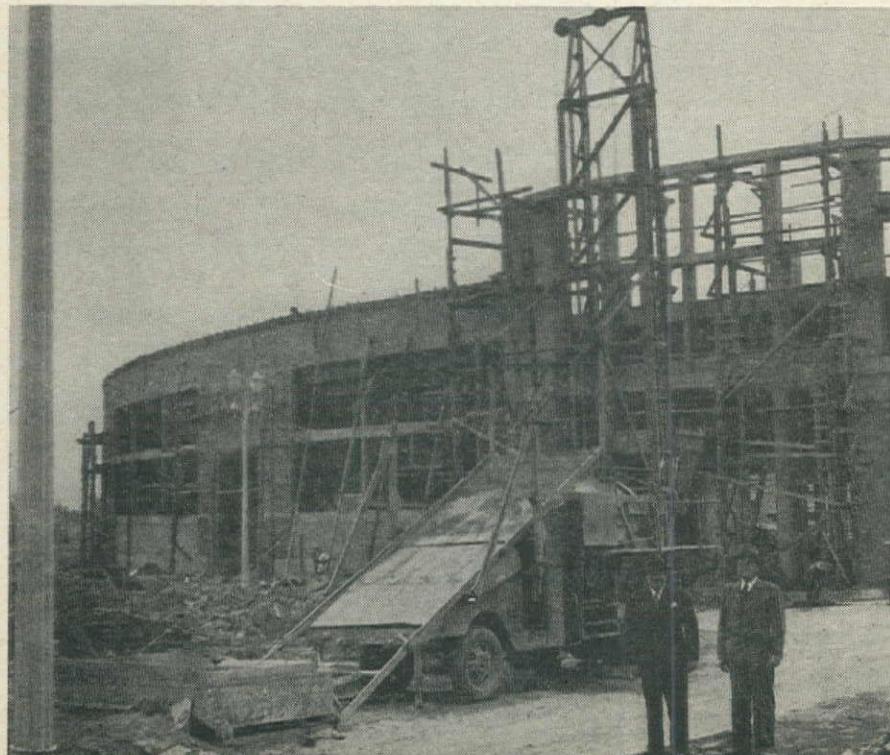
Idaho Power Firm Buys Rural Electric Co-op

IDAHO POWER COMPANY early in February purchased the Long Valley Cooperative, Inc., at Donnelly, Ida., for an approximate \$200,000 after the cooperative's members voted 273 to 5 to sell the system.

Under the terms of purchase, indebtedness of the electric cooperative to the federal government is to be paid, and membership fees and consumer deposits are to be refunded.

WORLD'S LARGEST BULL RING ERECTED IN RECORD TIME IN MEXICO CITY

THE LARGEST BULL RING in the world was completed Feb. 5 in Mexico City. Concrete was poured in 22 days of three 8-hr. shifts each, with modern machinery by Certified Cement Co. of Mexico City, the republic's largest construction company. The ring will seat 65,000 persons. In foreground are, left, GEORGE E. McNULTY, president of Reeder International, export agents for Mixermobile Co., Portland, Ore., and INGENIERO ARBIDE, president of the Certified Cement Co. Picture taken during pouring operations.



C. J. Strike, president of Idaho Power, explained that his company's offer was submitted at the request of the cooperative's officials.

The Long Valley Cooperative is the second rural electric "co-op" to be purchased by Idaho Power in recent months. Earlier, the Jordan Valley (Ore.) Cooperative sold to the firm.

At the meeting of the cooperative, it was argued that rate savings of approximately 33 per cent would be effected.

J. W. Crowe, Boise, division manager of Idaho Power, indicated that all customers would be transferred immediately to the company's standard rates. Extensions to new farm customers will be constructed as soon as weather conditions permit and materials can be obtained, Crowe promised.

REA, Bonneville Power Administration and Bureau of Reclamation representatives attended the Donnelly meeting.

Counties Get Approval For Road Construction

ALTHOUGH EXPERIENCE has demonstrated the economy and efficiency of the contract method of construction for highway projects, the Public Roads Administration will approve the construction of federal-aid projects by county forces on certain classes of secondary roads if the character of the work or circumstances surrounding the project make it unsuitable for economical construction by the contract method, according to an announcement by Commissioner Thomas H. MacDonald.

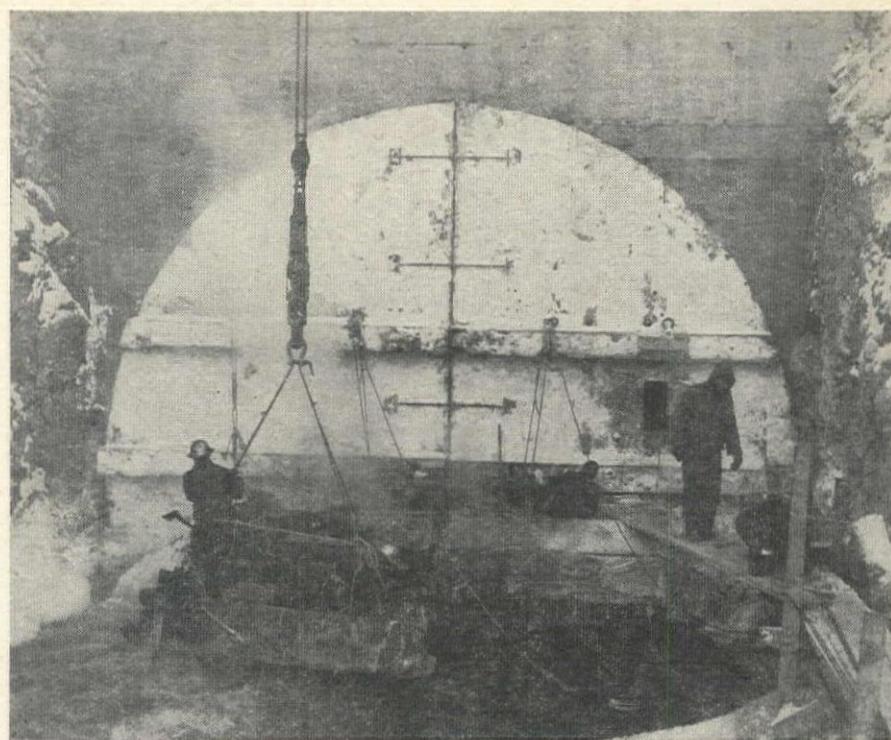
It also must be shown, Commissioner MacDonald said, that the county is adequately organized and equipped to perform the work, and that the cost is reasonable.

Projects of substantial character, such as those which are customarily constructed by the state highway department under the contract method, are not considered appropriate for construction by county forces, he added. Projects that might be suitable for construction by county forces would include light grading and surfacing and the installation of permanent culverts as stage construction.

Construction by county forces will not be approved in instances where it would be necessary for the county to purchase construction equipment not required for its normal operations.

Federal reimbursement to the state will be based on the quantities of work performed, computed at the unit prices shown in the state's agreement with the counties. The agreed unit prices, MacDonald said, should not exceed prices on comparable contract work. Use of county equipment will not be considered as a partial contribution in lieu of funds required to match federal funds.

On projects constructed by county forces, the state highway department will be responsible for the same degree of supervision and inspection as on projects constructed by contract.



ANDERSON RANCH GATE PLACED OVER TUNNEL IN ZERO WEATHER

PREPARING TO DROP the flap of an improvised gate for shutting off the old diversion tunnel on the Anderson Ranch Dam, Bureau of Reclamation project, near Mountain Home, Ida., workmen use torches and axes to remove a heavy coating of ice in sub-zero weather. The diversion tunnel was 20 ft. in diameter and 1,500 ft. long, with gate built of 12 x 12 timbers. Burlap helped provide a seal against the concrete.

Great Dam Builder Frank Crowe Dies

Francis Trenholme Crowe, "the greatest dam builder of them all," died Feb. 26 at Redding, Calif., close to the site of one of his greatest construction triumphs, Shasta dam. He was 63 years of age, and for over 40 years had been associated with the erection of great dams in many parts of the West.

His work started in 1905, when he



graduated in civil engineering from the University of Maine. Some of his earlier dams were Jackson Lake in Wyoming, Arrowrock in Idaho, and Tieton in Washington. Others were the Guernsey, Van Giesen, and Deadwood dams, but his greatest fame grew out of his work as general superintendent for Six Companies, Inc., constructors of Boulder dam, which he completed about 25 months ahead of schedule.

His most recent construction was Shasta dam on the Sacramento river, a unit of California's Central Valley Project. Shasta is the second largest concrete dam in the world, both in height and in volume, and was carried to a successful conclusion by Crowe in spite of wartime shortages of manpower and materials. It was the eighteenth dam he had built.

In construction of Shasta dam, he devised and operated the most extensive overhead cable transportation system ever undertaken. The head tower was built of structural steel and was 426 ft. high. Machine shops, power units and operating rooms were located in the upper portions of the tower, and from it seven cables radiated to strategically-located tail towers, enabling the pouring of concrete and rapid movement of materials and supplies to all parts of the huge project. The main cable span, across the crest of the dam proper, was over 3,000 ft. long.

Crowe was elected a member of the Moles, New York organization of tunnel and heavy construction men, in 1945, as a tribute to his work. In 1935, an honorary doctor's degree was conferred on him by the University of Maine.

WASHINGTON NEWS

... for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—The canonization of Saint Harold the Hatchetman has suddenly been so universal, from so many conflicting sources, and it has come from so many places concurrently, with such singular unanimity of thought and expression, that one wonders almost speechlessly how one almost missed recognition of this genius of administration and this solitary peak of grandeur in integrity among the honest men in public life. The literature of print and radio, which has poured out recently on the subject, makes one think of Marc Antony's oration over the fate of Caesar; and how Marc skilfully deflected consideration of Caesar's debatable qualities by focusing attention upon the sins and shortcomings of Brutus, which sins and shortcomings may or may not have actually been genuine. It is a happy thing to witness such insistence upon the administrative genius of a fellow man, and to hear such persistent and widely harmonious testimony to the honesty and integrity of any man.

Maj. Charles Olberg

The recent explosive happenings here, which involve Ickes and the Interior Department, bring to the minds of those interested in Western projects, and Western engineers, the name of Maj. Charles Olberg, the genius who designed and built the San Carlos Dam in Arizona for the Indian Bureau, and later was invited by the Russians to co-operate in the planning of the great Dnieper Dam, and other historic works in the Caucasus. Olberg had a distinguished career in the Army during World War I. He was an earnest, sincere, gifted gentleman of the highest type of probity and intellectual honesty. Maj. Olberg, like many another genius with his attractive personal qualifications, had an almost childlike faith in his fellow men.

When Olberg returned from Russia in the early thirties, Ickes had just begun his curious career in the Department of Interior. Among other activities, Ickes was responsible for projects under the label of the Public Works Administration. This phenomenon of the New Deal exploded in big jobs that made work all over the place. It gave temporary jobs to thousands of workless and diverted golden streams to patriots who sold materials, equipment, supplies. Also it required the services of great and square-dealing engineers and other technologists. Maj. Olberg became one of the engineers under Ickes in PWA.

The bloodhounds!

In the course of events there was a project in Texas. As the engineer, Maj. Olberg went to Texas and made recommendations concerning some types of equipment to be used. It was in these

days that, here in Washington, we regarded the Department of the Interior as an agency with its own secret service which evolved incidents that rivalled in color and action some of the mystery stories we now buy for 25c. We were so impressed with the taut and spectacular rectitude of Ickes that we told the youngsters this Nemesis from Winnetka would catch them if they did not watch out.

The Texas project had some relatively rich pickings for some suppliers in days when pickings were scarce. Olberg made his recommendations in absolute good faith, according to his best judgment. The people who didn't get any complained to Ickes. Ickes turned loose his bloodhounds.

The Texas project, Maj. Olberg, the successful suppliers, and others were swiftly brought before the Grand Jury. It is almost axiomatic in the practice of law that an indictment is an easy thing to obtain, but to make it stick is something else. Maj. Olberg was indicted. A profound shock was felt throughout the country wherever there were engineers and builders who know about dams and similar works. It is literally true you probably could not have found one person in the profession who believed there was even the remotest scintilla of basis for the indictment. Everywhere, in Government, in American Legion circles, among engineers, out in the Southwest and among engineers' organizations in the East, formal protests were addressed to Ickes against the indictment. Men of international reputation as engineers and as examples of outstanding integrity personally lodged their protests. If they were heard they were brusquely brushed off.

Shortly after the trial began, the indictment against Maj. Olberg was thrown out of court, and the judge ringing exonerated the Major of the charges. So far as the court could make amends, it removed the smear of the implication of the indictment. The national engineering associations took appropriate action to impress the exoneration upon their members. But so far as this reporter ever could discover, neither Ickes nor any of his associates ever took a solitary step to repair the damage the action had done.

The incident, probably insignificant in the tempestuous Government career of Ickes, cost Maj. Olberg much money and his health. He was a sensitive man, as many men of great talents often are, and he took to heart the ruthless trampling upon his reputation. Broken by the experience, he died a few years later. It is doubtful whether or not Maj. Olberg's name is remembered by Ickes. But during these days when Ickes challenges the integrity of the President, and when others of his ilk smear the good names of decent citizens, it is un-

questionably correct to assume that engineers and builders everywhere, and especially those in the West, where Olberg's San Carlos multiple-arch dam stands as a monument to his feat in saving the taxpayers \$5,000,000, will remember the tragic experience of Olberg; and in the light of this tiny bit of history they will probably more clearly understand the reckless rashness that possesses many arrogant men who crash into high Government jobs without adequate background, and who loose upon others the kind of harsh mudslinging which is now the great indoor sport in the District of Columbia.

This would not perhaps be a bad time to do something to register the memory of a great engineer, and an even greater gentleman, whose life shed luster on the lives of all engineers and builders by creating something in memory of gentle and kindly and gifted Charles Olberg, not only as a rebuke to spuriously sanctified hatchetmen, but as a perpetual reminder that engineers, such as Olberg, live heroic lives in peace times among the political wolves and, despite all circumstances, add to the sum total of the things that benefit their fellow men.

Who now?

At this writing, late in February, there are literally hundreds here who are tensely waiting the announcement of the identity of Ickes' successor. In politics nothing is certain except the unexpected. If normal reasoning applied, the appointment of Associate Justice William O. Douglas could be expected. In the past two or three days he has been summoned to the White House twice. The professional politicians are for him. He is regarded as ultra-left and the New Dealers are for him. He is a westerner by temperament as well as education. But the curious aspect is that a considerable element among the ultra-left New Dealers do not want him to leave the Supreme Court. They say it would be difficult to replace him. More important still, they do not apparently wish a realistic person, such as Douglas, in command at Interior. He is regarded as not easily influenced nor controlled.

(Since Mr. Kruckman wrote these comments, J. A. Krug has been appointed Secretary of the Interior. See "Late Wire" on the next page.—Ed.)

Tidelands ownership

There are just as many persons in the capital who think Ed Pauley will be confirmed for the Navy post as there are others who think he will not. The tidelands hearings brought an imposing array of proponents to the capital; but the Pauley mess smothered the demonstration and impelled the senators to keep it under wraps. They do not wish to vote on it now. There also is a feeling here that the leadership among the proponents left much to be desired. The situation is compared to the embarrassments and the lack of skill that caused the westerners to lose the battle against the Mexican Water Treaty. Incidentally, if Ickes had not tangled with the President it is almost certain he would have been appointed as chairman of a dele-

gation to UNO in an international conference to study the conservation of the world's resources of oil, coal, wood, power and other natural resources. In all this turmoil it has almost escaped general notice that the Senate confirmed the President's appointment of W. John Kenney of California as Assistant Secretary of the Navy.

Authorities

HR 5083, introduced by Congressman Henry R. Jackson of Washington, to establish a Columbia Valley Authority, has been assigned to a sub-committee of the House Rivers and Harbors Committee for hearings. But the hearings have been indefinitely postponed at the request of Congressman Jackson, who also asked that the request for reports from the federal departments on various phases of the bill be postponed. It is not known just what the maneuvers mean. Obviously, the bill will not come before Congress in the near future. The Jackson bill is the complement to the bill introduced in the Senate, S. 1716, by Sen. Mitchell. The program now is to create an Authority which will include substantial areas of Washington, Oregon and Idaho.

It is an interesting note that Judson King, once on some vaguely defined basis employed by TVA, and for many years widely known in the West in connection with his Public Ownership League, has appeared as a champion of the CVA, under the title of Director, the National Popular Government League of Washington. For years King operated with the support of Sen. Norris of Nebraska.

Appropriations

Hearings on appropriations for the Bureau of Reclamation have just begun; the House Committee reported a recommendation of \$115,783,250 for rivers and harbors, cutting \$7,803,205 from the budget approved by the President. Maintenance and improvement would get \$112,883,250; work on bridges over navigable waters, \$2,900,000; \$42,776,250, for construction work on 21 projects; \$2,235,500 for further planning on 20 projects; and \$67,871,500 for maintenance of existing projects. Flood control would get \$163,781,000, which cuts the President's budget by \$28,300,000; Sacramento River, Calif., would get \$2,000,000; and the construction of the Fort Peck Dam, Mont., power plant, was approved for \$1,505,000.

Chairman John R. Murdock of the House Committee on Irrigation and Reclamation, introduced HR 5434 which would re-authorize the Gila project in Arizona, with the condition that the area be reduced to 75,000 ac. on the Yuma Mesa and in the North and South Gila Valleys, to be known as the Yuma Mesa Division, and the Wellton-Mohawk Division, within the areas of Wellton, Dome, Roll, Texas Hill and Mohawk. The project would come under the general provisions of the Boulder Dam Project.

Miscellaneous

Floyd O. Hagie, secretary-manager of the National Reclamation Association,

LATE WIRE

KRUG'S APPOINTMENT to Interior was literally an absolute bombshell to all elements here. All-inclusive Interior Department reaction was, "It could be worse." Leftish New Dealers were keenly disappointed. Private power utility people sincerely applauded appointment, saying they know he is a public power advocate, always has been and may be expected to favor Columbia Valley and other Authorities; but he has always been fair in dealing with them, citing that while head of WPB power division he reversed his radical predecessor's plan to build a national power system to fill the gaps in the private systems.

They say he decides on facts, is reasonable, not a crusader, and is always susceptible to a realistic approach. Liberals are rather sad, but feel somewhat as do utility people, pointing out that he is the only original New Dealer progressively to advance step-by-step in government. Radical New Dealers have been against him since he was head of WPB as too moderate. They feel he dealt too cordially with business people. No one questions his integrity, nor his inclination to investigate, listen, and think before making decisions.

He has always been frankly hostile to Ickes, and is expected to clean out Ickes' influence and possibly reveal any hidden Ickes messes.

It's true his wide acquaintance with the Far West is from a train window or an airplane, but he is genuinely interested in the West slope, wanted to go there to live, and has read every book on any Western subject from Alaska to Texas. He regards himself as an economic engineer, and ardently favors industrial development of the West, looking upon the area as America's future.

His appointment is probably almost purely Truman's judgment and will. The muddle and confusion around the varied political claimants became so impossible it was not feasible to choose from among their innumerable candidates. Truman was the WPB standby in the Senate and a strong mutual friendship with Krug sprang up at that time. Their mutual dislike of Ickes is a bond.

Krug is big, bumbling, forthright, realistic, folksy, brilliant but not showy, broad visioned with small-town friendliness, good company but no truckler, thoroughly competent in anything he attempts, and thoroughly appreciates Krug without being an unpleasant egoist.

I think he is good medicine for the West, if it can show why Authorities are wrong. I doubt he will try any pitchfork tactics in validating CVA.

was the principal proponent in testifying in favor of the bill HR 5124, to change the rate structure of power generated by the Bureau of Reclamation under the Act of 1939. The bill would definitely clarify the intent of Congress that commercial power plants built in connection with irrigation projects must be repaid to Government within 50 years with 3 per cent interest per year. It came out in the testimony of the solicitor of the Department of Interior the department had so construed the Act for five years, and acted accordingly; but at the end of five years the Power Division of the Interior Department challenged the interpretation, or the intent of Congress, and the solicitor, after consideration, determined the Power Division was right and that Congress meant the commercial plants should pay only 3 per cent per year, not pay interest on the principal nor pay off the principal after 50 years. It is anticipated the bill will be reported favorably to Congress, pinning down the intent that the principal must be paid off in 50 years. The Department of Interior apparently intends to make a fight for its point of view on the floor of the House.

It is reported here that since October the states have made contracts for highway work at the rate of approximately \$60,000,000 per month. The real test is expected this spring, when the trial lettings will be defined. The word is that it is expected there would be some advance over 1940 and 1941. The bids as they are reflected in reports that come here indicate contractors are bidding high. The impression appears to be that until the labor troubles are more clearly settled, contractors do not wish to lift the wage levels. It is this labor situation which presumably is holding up road work in all parts of the country.

Army District Engineer Awarded Legion of Merit

COL. GEORGE MAYO, District Engineer of the San Francisco District, Corps of Engineers, now Acting Division Engineer of the Pacific Division, was presented with the Legion of Merit at the Headquarters, Western Defense Command, Presidio of San Francisco, on Feb. 21, 1946. Brig. Gen. H. F. Nichols presented the citation and medal to Col. Mayo, who earned the decoration while serving as Air Engineer, Headquarters Army Air Forces, from Dec. 1943 to July 1945. The citation praises Col. Mayo for the development of training standards, the equipping of engineering elements, the development of specialized equipment and for the development of flying fields during his tenure. Col. Mayo, a native Californian, is a graduate of the University of California, class of 1911, and has been a member of the Corps of Engineers since 1916. At the outbreak of the war with Japan he was sent to the Panama Canal Zone as Chief Engineer of the Caribbean Defense Command and was subsequently Division Engineer of the Panama Engineer Division. He has been District Engineer of the San Francisco District since last October.

Navigation Improvements on Columbia River Will Reduce Shipping Charges

SUGGESTED NAVIGATION improvements in the Columbia River will save Columbia Basin Project settlers and industrial establishments more than \$700,000 yearly in transportation charges, according to a report prepared by U. S. Army Engineers.

Already destined to provide water and power for the extensive irrigation development in south Central Washington, the Columbia also can be used to handle many thousands of tons of freight for the more than 250,000 persons who ultimately will live in the Basin, the report explains.

In advocating further navigation improvements for the nation's second largest river, the Army engineers predict that annual savings of more than \$400,000 would accrue from Columbia River transportation of petroleum products to the Basin; \$216,000 from imports of general merchandise; and \$108,000 from exports of farm products. These savings are computed on present rates for rail haul, and a probable future water rate, which it is estimated will prevail upon completion of the projects proposed for the Columbia River.

Besides the estimated yearly imports of 175,000 tons in petroleum products, such materials as sugar, salt, canned goods, building materials, and heavy hardware also would be shipped to the Basin by river, from manufacturing centers on the Lower Columbia, according to the engineers.

River imports of general merchandise to the Basin eventually will reach 100,000 tons annually, the report forecasts. These would consist of salt and sugar, 15,000 tons; groceries, including canned goods, 20,000 tons; and heavy hardware, glassware, and building materials, 65,000 tons.

On the export side, the river would

carry about 50,000 tons of farm goods annually from the Basin, chiefly animal products and processed fruits and vegetables.

Another possible source of outgoing tonnage would be products from electrochemical, electro-metallurgical, and other industries which might take advantage of the great quantities of low-cost power produced by Grand Coulee Dam.

Included in the report, known as "River Transportation—Columbia Basin Joint Investigations," are charts and drawings showing the growth of the Columbia River as a commercial waterway, a map of channel dimensions, and tables of commodity movements for the period 1938 to 1943, inclusive.

Mark Tuttle, Manager of Salt Lake AGC, to Retire

MARK TUTTLE, manager of the Intermountain Branch of the Associated General Contractors of America for almost 20 years, resigned his post March 1.

In announcing his resignation at his Salt Lake City office, Tuttle informed the board of directors of the branch that he intended to take a short rest and "better enjoy his family."

At a special session, board members announced they had accepted the resignation with "regret and reluctance." A successor probably will be named early in March, Ted C. Jacobsen, president of the branch, predicted.

Prior to taking the managerial post with the contractors' organization, Tuttle had served in various Utah public offices, both county and state. He served as Emery county clerk, deputy state auditor and state auditor, and was the first president of the Utah State Association of County Officials. After leaving

his post as state auditor he became secretary-treasurer of the Gray Lines Transportation Company. He joined the contractors' organization in February, 1927.

In addition to his work with the contractors, Tuttle was active in Salt Lake City civic affairs. He is a member of the Salt Lake Rotary Club and the Chamber of Commerce.

OBITUARIES . . .

James E. Mackie, 47, civil engineer and western manager of the National Lumber Manufacturers' Assoc., was killed February 21 in an automobile collision in Brisbane, Calif. His home was in Menlo Park, Calif. He was formerly chief building inspector at Long Beach, Calif., and later secretary of the Pacific Coast Building Officials Conference, working on the uniform building code. He had been with the lumber association since 1935.

Edward E. Lembke, 83, president of the Lembke Construction Co. of Albuquerque, N. Mex., died January 23 at his home. Lembke was a pioneer in New Mexico construction with building projects dating back to 1886 and comprising many of the most familiar in Albuquerque. From 1920 to 1930 he was associated with contractor J. T. McLaughlin. His son, Charles Lembke, former mayor of Albuquerque, has been directing operations of the firm and will carry on the business.

Nathan Rosenblatt, 79, founder of the American Foundry & Machine Co., the Structural Steel & Forge Co., and the Eimco Corp., all in Salt Lake City, Utah, died February 16 in a Los Angeles, Calif., hospital of a heart ailment. Rosenblatt, a native of Russia and resident of Salt Lake City for 58 years, was occupying the presidency of all three machinery firms at the time of his death.

Elmer M. Markham, 43, former construction engineer of Oakland, Calif., died last month after a short illness. In 1942 Markham went to Pearl Harbor to assist in salvaging ships sunk in the Japanese attack.

George V. Turner, 45, construction engineer and partner in the Gaasland Construction Co. of Seattle, Wash., died in January of carbon monoxide poisoning.

G. Fred Jenson, 55, prominent Salt Lake City engineer, died last month of a coronary occlusion. Jenson was an employee of the W. E. Ryberg Co., and also an architect.

Walter G. Carson, who was working with the Bureau of Reclamation in Idaho, died suddenly at his Boise home recently.

LONGEST TRUCK LOAD ON OREGON HIGHWAY CARRIES CRANE BEAMS

CRANE BEAMS from the Kaiser subsidiary shipyard at The Dalles, Ore., were hauled by St. Johns Express Co., of Portland, on the longest truck-trailer combination ever to move over the famous Columbia River Highway. They will be installed in a new plant costing \$250,000 being erected by Pacific Chain & Manufacturing Co. in the Guild's Lake section of Portland. Four of the 105-ft. crane beams will be thus transported.



Hangars Collapse

(Continued from page 98)

the structures may have been factors contributing to the collapse, the estimated wind velocities were such that it appears improbable that the structures as designed could have withstood the high overload imposed without the existence of these factors.

6. Estimated wind velocities were such as to impose loads of at least two and one-half times those designed for.

7. Under the circumstances it would be unreasonable to expect the structures as designed to withstand the loading imposed and, since it might be considered unreasonable and uneconomical to design structures of this character and magnitude to meet hurricane conditions to which these buildings were subjected, the collapse may be considered in the "Act of God" classification.

8. The fire-retardant-treated wood afforded all the protection which should be anticipated. Although it was instrumental in preventing the spread of fire and did not itself support combustion, no organic material can be expected to resist sustained fires at temperatures exceeding 2,000 deg. F. which are fed by large quantities of high octane gasoline.

Construction Increase Reported for January

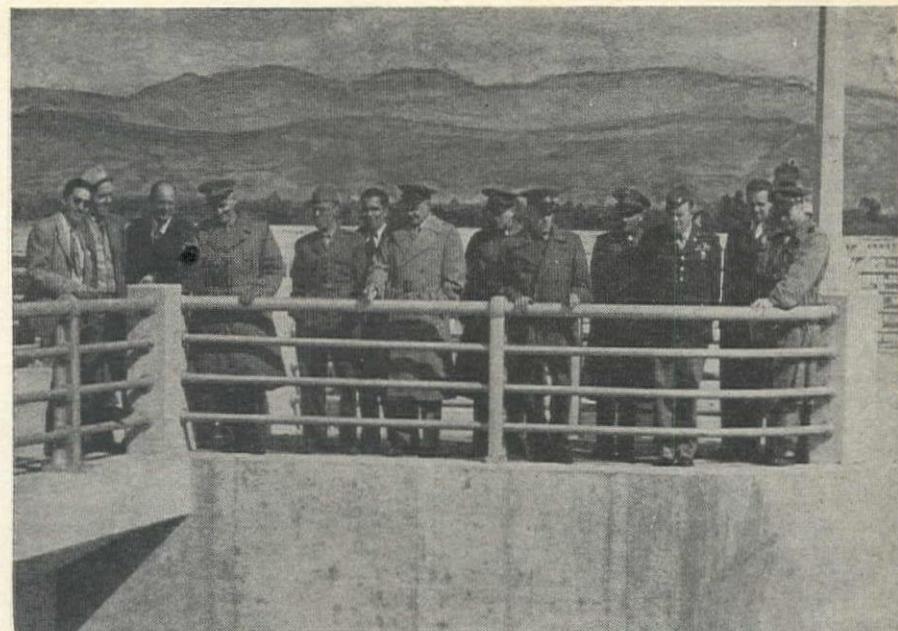
NEW CONSTRUCTION in January, 1946, totaled \$503,000,000, an increase of 6 per cent over December and 82 per cent over Jan., 1945, the Construction Division, Department of Commerce, reports.

Privately financed construction in Jan., 1946, reached the highest level in almost five years with a volume of \$394,000,000. This figure represented an increase of 8.5 per cent over December and 249 per cent over Jan., 1945. The rise from December to January was a deviation from the normal seasonal trend of about 5 per cent decline.

Publicly financed construction declined \$2,000,000 from the December level to \$109,000,000 in January. The volume of publicly financed construction in Jan., 1945, was \$164,000,000.

In the privately financed group, residential construction (exclusive of farm dwellings) amounted to \$138,000,000 in Jan., 1946, and showed only a small rise—3 per cent—from December. Construction of stores, restaurants and garages increased 24 per cent from December to \$46,000,000 in January, and industrial construction advanced 12 per cent from December to \$111,000,000 in January. Privately financed public utilities construction continued at a fairly even pace with \$48,000,000 in January as compared with \$50,000,000 in December.

The volume of publicly financed residential construction in January amounted to only \$1,000,000, the same as in December, and public non-residential construction also remained unchanged at \$31,000,000. Military and naval construction continued its downward trend,



BRAZILIAN ENGINEERS TOUR U. S. INSPECTING CONSTRUCTION PROJECTS

BRAZILIAN ARMY engineers inspect Sepulveda dam during a ten-day visit as guests of the Los Angeles District, U. S. Engineers, and of district engineer, Col. Robert C. Hunter. Left to right: Edward A. Gutierrez, Raymond L. H. Huebscher, Burnham H. Dodge, Lt. Col. Antonio Bastos, Maj. Rodriko Jordao Ramos, Roberto E. Almanzan, Colonel Hunter, Col. Decio De Escobar, Brig. Gen. Francisco De Oliveira, Col. Fernando Fernandes Tavora, Col. William C. Bennett, Jr., Joseph R. Brennan, James W. Dunham and Lt. Col. Wilbur M. Clement.

dropping 10 per cent from December to \$17,000,000 in January. Highway construction amounting to \$25,000,000 in January reflected seasonal influences in a 14 per cent drop from the previous month. There were small increases in January in hospital, institutional, educational, and sewer and water construction.

The recommended program of construction will center around railways, highways and port facilities, all of which will need considerable development and rehabilitation because of the prolonged strife in China just recently brought to an end.

Sewer Program

(Continued from page 101)

of a sewerage system and treatment plant. No cost estimate.

VANCOUVER: An engineering firm has been commissioned to plan and supervise construction of a sewerage system and sewage disposal plant estimated to cost \$800,000.

WALLA WALLA: City has indicated its intention of enlarging its present standard trickling filter type sewage treatment plant. Overload has been created by industrial expansion. Estimated cost, \$150,000.

WHITE SALMON: An engineering firm has been retained to make plans for a sewerage system and sewage disposal plant. No estimate of cost given.

WINLOCK: Engineer employed by the city has submitted preliminary plans to convert present combined system into a sanitary sewer system, construct new storm sewers and improve existing treatment. Cost estimate, \$30,000.

WOODLAND: Engineers retained by the town have submitted preliminary plans for sanitary sewer system and treatment plant. Cost is expected to approximate \$150,000.

YELM: The city has been advanced \$2,500 and an engineer has been hired to prepare plans for a sewerage system and disposal plant estimated to cost \$35,000.

PERSONALLY SPEAKING

H. L. Senger has recently been appointed assistant to the general superintendent assigned to the study of new power plant sites for the Idaho Power Co. of Boise. Senger prepared the schematic plan for the hydroelectric development project at Upper Salmon Falls on the Snake River, near Hagerman, Ida. In his new position he will continue to supervise the overall engineering aspects of the Upper Salmon project. **J. F. Emery**, formerly assistant electrical superintendent with the company, is now assistant to the general superintendent responsible for planning other than that related to power development. His duties comprise electrical system planning and design relative to expansion and reconstruction.

George W. Malone has purchased the interest of Thomas R. King in the engineering firm of King & Malone, organized in 1916, and will operate it under the name of Malone Engineers. Main office of the firm will continue in Reno, Nev., and branches have opened in San Francisco and Washington. Malone was state engineer of Nevada from 1927 to 1935, a member of the public service commission and secretary of the Colorado river commission, and managing director of the Industrial West foundation which made an economic survey of the 11 western states, Alaska, Hawaii and the Philippines.

Col. Joseph S. Marriott of the Civil Aeronautics Administration has returned to his previous post as administrator of the sixth region at Santa Monica, Calif., after representing the air forces in the Interdepartmental Air Traffic Control Board in Washington. The board was concerned with control of air space for traffic, facilities to resist enemy air invasion, and the establishment of airports and airways under wartime conditions.

The consulting engineering firm of Leeds, Hill, Barnard and Jewett, Los Angeles, Calif., has been succeeded by Leeds, Hill and Jewett, Consulting Engineers, composed of **Charles T. Leeds**, **Raymond A. Hill** and **John Quincy Jewett**. Quinton Engineers, Ltd., will carry on the general engineering practice of the former firm under the presidency of **Archer F. Barnard** with **Don Hull McCreery**, vice president and general manager, and **Otto Konstanzer**, secretary and treasurer.

Ray L. Allin, civil and hydraulic engineer, has opened a consulting engineering and surveying practice in San Francisco, after 40 years of experience in design and general supervision of construction of approximately \$50,000,000 worth of work.

From 1944 until the present time, Allin did estimates for Hunters Point, Alameda Air Base and Rough & Ready Piers, and was in charge of design, estimates and field layouts of sanitary systems and levee work. Since the beginning of the war he supervised design for numerous Army and Navy installations in the Bay region. Before that time his engineering projects included Alpine Dam, Hetch Hetchy Project of San Francisco, O'Shaughnessy Dam, Lodi Dam, Juncal Dam and St. Mary's Dam. From 1906 to 1923 he was assistant hydraulic engineer for the state of California.



COL. O. E. WALSH

Col. O. E. Walsh has been assigned to Portland as District Engineer of the U. S. Army Engineers after a long overseas career. A West Point graduate, Col. Walsh did engineer duty in China, Philippines, Panama and many U. S. spots before the war. He received the Legion of Merit for reconnaissance with an engineering unit prior to landings on Woodlark and Kiriwina islands in 1943. As head of an engineer construction brigade he was in the Leyte and Luzon operations and in charge of all heavy construction and engineering for the Luzon operations, which included rehabilitation of Manila. He was awarded the Bronze Star for rapid construction of a railroad from Lingayen gulf to Manila. Last August Col. Walsh witnessed the Japanese surrender aboard the battleship Missouri in Tokyo Bay.

James G. Lindley, former project director of the War Relocation center at Amache, Colo., in charge of 8,000 evacuees, has been made chief of the regional branch of operation and maintenance, Bureau of Reclamation, in Sacramento, Calif. His main duty will be the prosecution of repayment contracts with irrigation districts that will be served water by the Central Valley Project, and completion of the plans for opening to homestead entry about 7,000 ac. of the Klamath Project, Ore.-Calif. Before he worked for the government, Lindley was superintendent of the Clifton, Ariz., property of the Phelps Dodge Corp., a smelter that turned out ten million pounds of copper a month.

B. B. Bessessen, power engineer with the Bureau of Reclamation, is in El Paso, Tex., to administer the planning, construction, operation and maintenance of the Rio Grande Power System. For the past year Bessessen was chief of planning and resources branch of Power Utilization, Amarillo, Tex. He served during the war as an Army engineer and before that was general superintendent of maintenance and operation of the TVA in the lower Tennessee River area.

S. A. Nash-Boulden, supervisor of Los Padres National Forest, Santa Barbara, Calif., is transferring to the California region headquarters of the U. S. Forest Service in San Francisco, where he will direct statewide federal activities in forest fire prevention. **Andrew C. Brenneis**, supervisor of Trinity National Forest, Weaverville, Calif., will succeed Nash-Boulden at Santa Barbara.

R. J. Ephland of Billings and **Mark Hopkins** of Helena, Mont., received certificates of merit for their devotion to duty for more than 25 consecutive years from the American Association of State Highway Officials. Ephland is district engineer in the Montana Highway Department, and Hopkins is associate bridge engineer in the headquarters office.

Ralph Olmstead of Boise, Ida., is in Shanghai, China, with UNRRA, in charge of reconstruction of the mile-long break in the dikes of the Yellow River near Cheng-chow in Honan province. Olmstead said that 20,000 laborers are starting on the project, for which piling, pile drivers, rock and rail equipment are being sent to Cheng-chow. He expects to have the huge stream restored to its course by July.

Sam J. Dumbolton has resigned as Kittitas, Wash., county engineer after seven years of service there. He asked that he be released so that he could accept a position as assistant engineer in Spokane Co., where he will be in charge of maintenance and survey work and the operation of road crews.

Col. Light B. Yost has been appointed executive director of the President's Highway Safety Conference to be held May 8, 9 and 10 in Washington. Yost served in Army transport in the European theater of operations and was given the new assignment because of his broad civilian and military experience in highway transport and safety.

Maj. E. H. Rausch, Jr., C.E., chief of the readjustment division, Seattle District U. S. Army Engineers, has been separated from the Army at Ft. Lewis, Wash. Rausch is returning to the Seattle Army Engineers as a civilian. When called to military duty in 1942 he was an engineer on Alaskan construction assignments.

The American Society of Civil Engineers has opened a western office in Los Angeles, Calif., with **Lt. Col. Walter E. Jessup** as western representative. Jessup was formerly with the New York headquarters, ASCE, and recently released from active duty with Corps of Engineers. The Los Angeles address is 400 Edison Bldg.

A. H. Frazer, formerly manager of Percy Betn Ltd., has purchased a half interest in the E. Moller Construction Co., Ltd., of Penticton, British Columbia, and will hold the position of vice president and business manager. **E. Moller** is continuing as president of the company and also acting as construction manager.

Charles G. Anderson has been appointed regional director of the Bureau of Reclamation at Billings, Mont. Anderson has been associated with the Bureau since 1924 and, as a lieutenant commander in the Navy, served as executive officer for a construction battalion on Oahu and Saipan. Prior to entering service, he was employed as office engineer at Shasta Dam, Central Valley project in California.

Irma M. Greenawalt has been elected chairman of the Denver, Colo., housing authority, succeeding Msgr. John R. Mulroy. Before the war the Housing Authority eliminated some 1,000 slum dwellings and built 770 homes for low income families. Now it is concentrating on housing for veterans.

Louis Goss, recently appointed city engineer of Brawley, Calif., has announced that much-needed repairs to his city's water treatment plant are under way. Before his appointment as city engineer, Goss was an associate engineer in the U. S. Engineer office in Los Angeles.

Charles W. Finn, former manager of the Seattle office of the engineering firm of DeWitt C. Griffin and Associates, is now general manager of a new firm, The Pyramid Co. The firm will engage in general industrial engineering and architectural work. R. C. Detrich is assistant general manager.

Recently awarded life certificates of membership in the American Society of Civil Engineers for their outstanding contributions in bridge and highway construction and irrigation development were Harold J. Doolittle and C. A. Burnette of Spokane, Wash., and R. H. Fifield of Helena, Mont.

Maj. Lester G. Williams transferred to the San Luis Valley Project of the Bureau of Reclamation at Monte Vista, Colo., as a civil engineer after four years in the Army Air Corps. Before the war, Williams was an engineer on the Altus Project, Altus, Okla.

R. J. Bartol, C. M. Shearer and Claude W. Chase have filed articles of incorporation for the Bartol-Shearer Contracting Company, Inc., of Phoenix, Ariz. They will engage in a general contracting and building business.

J. W. Oosterink, originally a Dutch architect, has been appointed building inspector for the city of Victoria, British Columbia. Oosterink first came to Canada in 1914. Following the first World War he engaged in the construction business in Saskatoon for many years.

Talcot Moore has resumed his position as highway construction engineer for the southern half of the state of Wyoming, and **J. E. Wiley** has been appointed a right-of-way engineer. Both men were in the Wyoming highway department previously, and served overseas in the Army during the war.

Robert G. Taffinder, former construction supervisor of the Manila area, American Red Cross, has been appointed PRC general field representative, to assist the Red

Cross in the organization and development of chapter offices in the provinces.

John L. Baugh is another civil engineer returned to the Bureau of Reclamation after three years' service in the Navy. Prior to his induction into the Navy, Baugh was with the Bureau at Albuquerque, N. Mex. Now he is working at the San Luis Valley Project, Monte Vista, Colo.

Grant Thorn, contractor of Springville, Utah, was selected as Utah's most outstanding young man by the Utah State Junior Chamber of Commerce February 17. The 35-year-old contractor is national vice president of the Junior Chamber, and is a candidate for national president.

Frank W. Knowles, ice-machine company executive, has been elected president of the Seattle Engineers' Club, succeeding **A. L. Atherton**. Other new officers are **Fairman B. Lee**, vice president; **E. K. Blackford**, secretary, and **E. D. Alexander**, treasurer.

Frank A. Barnes, Kenneth L. Smith and Howard G. Truitt, all of Phoenix, Ariz., have filed articles of incorporation for the "Salt River Sand and Gravel Co." of Phoenix, which plans to conduct a general sand and gravel supply business in the state.

Percy H. Bliss has been named assistant regional construction engineer at Billings, Mont., with the branch of design and construction, Bureau of Reclamation. During the war Bliss served in the Navy as a lieutenant commander.

Harry L. Miller has been appointed district engineer for the Idaho office of the Federal Works Agency, and **George F. Burke** is district engineer for the Montana area. Both offices are new ones in FWA's bureau of community facilities.

BERNARD TOUEY, Arizona state engineer, has resigned his position, effective April 1, to engage in a private engineering practice encompassing activities in Arizona, New Mexico and Texas. Touhey is shown below at his desk. **W. C. LEFEBVRE**, at present in the Navy, has been appointed to the post and will take office on April 1.



J. W. (Jess) Hoopes, for two and a half years a lieutenant commander in the Seabees, has resumed his former position of general superintendent of the Inter-Mountain Division of the Utah Construction Co. with headquarters in Salt Lake City. **Allen D. Christensen** is manager of the division.

Ross W. Justice, assistant estimating engineer for the Los Angeles Bureau of Engineering for 10 years, has been made head of the estimating section of the Street and Parkway Division, succeeding **John L. Moyer**, who organized the department 15 years ago.

A. L. Putnam is back with the Wyoming State Highway Department as a construction engineer, after two and a half years in combat zones and a stay at the Fort Warren, Wyo., area office of U. S. Engineers as chief engineer.

Tom Lease, during the war a lieutenant at the naval air station at Hutchinson, Kan., has returned to his position of city superintendent of parks and boulevards in Great Falls, Mont. During his absence the superintendence was held by **Casper Gonser, Jr.**

John F. Lamb, who was assistant district engineer with the Bureau of Community Facilities, FWA, in Los Angeles, is now in the Division VII office in Berkeley, Calif., as assistant division engineer for construction.

Oscar Thompson was reported in error in *Western Construction News*, January, 1946, as being vice president and manager of **H. H. Larsen Co.**, San Francisco. Thompson is one of the firm's construction superintendents.

Andrew Nicholson, electrical plan examiner for the Seattle building department, has resigned from the service at the age of 65. He entered the department in 1914 as an electrical inspector and became plan examiner in 1938.

Richard Okuda, who worked on public works projects at the War Relocation Authority in Granada, Colo., is now a civil engineer draftsman on highway work with Parson, Brinkerhoff, Hogan & MacDonald of New York City.

The Los Angeles, Calif., post of AM-VETS, American Veterans of World War II, has been organized by Wm. A. Arnold and was named in honor of Col. Rufus W. Putnam, outgoing district engineer of the U. S. Army Engineers there.

Grant E. Huey, builder and carpenter in Yakima, Wash., for 20 years, has been named city building inspector there. Huey succeeds **W. W. deVeaux**, who resigned after serving since 1936.

Edward F. Conrey, soils technologist, has been appointed to the Bureau of Reclamation, San Luis Valley Project, Monte Vista, Colo. Conrey was formerly with the Corps of Engineers at Tulsa, Okla.

Spencer Webb, for many years of the contracting firm of Werner & Webb of Los Angeles, and a lieutenant in the Sea-

bees during the war, is now in business for himself as a heavy duty contractor in Los Angeles.

Leverett Davis of Boise, Ida., former state aeronautics director, was granted a license to practice mining engineering in Idaho by reciprocity, the first of its kind to be granted. Davis is licensed in Oregon.

Harold O. Strombom, recent Army captain, has begun his new duties as assistant Skagit Co. engineer at Mount Vernon, Wash., succeeding L. J. Wright, recently resigned.

J. Hanes Howell, California contractor, has been promoted to the rank of major in the Army Air Forces. He is special projects officer in the utilities section of the 316th bombardment wing.

Ward E. Mathias, a captain in the Army Air Corps for three and one-half years, is now back with the Bureau of Reclamation, San Luis Valley Project, Monte Vista, Colo., as an engineer.

"International Constructors" is the name of a newly-opened office of building contractors in Seattle, Wash. The firm is especially interested in South and Central American contracts.

Charles O'Neil has established a general contracting business in Palo Alto, Calif., and vicinity. For the past 20 years he has been connected with contractors in Southern California and Honolulu, T. H.

Siebert Rudman, D. A. R. Berland, J. R. Morland, Fannie G. Proges, Emily Gesas, Myron Proges and Myron Proges, Jr.,

SURVEY PARTY from the Portland District Office of the U. S. Engineers, laying out levee strengthening work on the Boise river in Idaho. Left to right: EARL WILLIAMS, head chainman; HERBERT FORD, transitman; JOHN MCGILL, stakeman; JAMES MOORE, levelman; KERMIT EPPS, chainman; ELMER CORDILL, rodman; and E. A. REID, chief of party.



have filed articles of incorporation for the R. and G. Building Co. of Pocatello, Ida.

Ralph Simonds recently qualified for permanent appointment as assistant city engineer of Seattle in a civil service examination, and will be retained in that capacity.

W. W. Aultman, a former lieutenant Commander, USNR, has been released by the Navy, and has returned to the Los Angeles, Calif., Metropolitan Water District.

Walter A. Pierson, formerly supervising engineer for the Bureau of Community Facilities, FWA, in Arizona, is now district engineer of the bureau for Arizona.

Ens. Arthur V. Dienhart, Naval Civil Engineer Corps, is now engaged in construction and maintenance of Navy public

works on Saipan. Before he entered the service, Dienhart was with the Dravo Corp., Pittsburgh, Pa.

Frank T. Hickey, Inc., general contractors, have moved their office, shop and yard to 1645 Allesandro St. in Los Angeles.

Sumner G. Margetts of Salt Lake City has been appointed engineer for the towns of Kaysville and Centerville, Utah.

Donn Emmons has joined the architectural firm of William W. Wurster and Theodore C. Bernardi, making it now Wurster, Bernardi and Emmons of San Francisco.

Ben Rome of Tacoma, Wash., has combined a residential plan service with his contracting and concrete block manufacturing.

SUPERVISING THE JOBS

A. G. Buchanan is general superintendent, George Paul is steel superintendent, Orville Kanary is expeditor and Dale Kearmin is labor foreman on several large structures C. L. Peck, Los Angeles contractor, is building in that city. C. R. Getty is job superintendent on the pump division buildings for Byron Jackson Co., costing \$1,500,000. Bill Parr is general carpenter foreman; Tim Condon, field engineer, and Dale

Counter, superintendent of heavy equipment. On the E. L. Cord administration building, a \$100,000 job, Frank Matchette is job superintendent and Don Allen is field engineer.

Andy Jensen is general superintendent and Van Drouillard is project manager on the expansion of Sears Roebuck & Co.'s main store in Los Angeles, Calif. Unique feature of the building will be the center section of the floor which is being constructed on specially designed rollers to make it earthquake-proof. General foreman on the job is Walt Crockett, carpenter foreman is Al Brown and office manager is Leo Manning. Myers Bros., of Los Angeles, is the contractor.

William Bushelle is job superintendent for Guy F. Atkinson Co. of Long Beach on a \$139,654 contract for construction of auxiliary service buildings at the harbor steam plant at Island Avenue and B St. in Wilmington, Calif. Al Nemitz and Harold Drews are carpenter foremen; Harold Walker, office manager; Jack Murphy and Bud Yates, excavation superintendents; Lawrence Cenotta, labor foreman, and Pat O'Barr, master mechanic.

Ernie Snyder is job superintendent for L. E. Dixon Co., Los Angeles, on the new Sears, Roebuck & Co. branch at Inglewood, Calif. Ed Johnson is carpenter foreman, Ellis Daniel is labor foreman, Harry L. Stevens is office manager and W. Haapala is detailer.

Harry B. Rightmire is project manager and Carl E. Larson is general superintendent for the P. J. Walker Co. of Los Angeles, Calif., on a new department store being built in Pasadena for Bullocks of Los Angeles. Lester E. Brasher is general carpenter foreman and Rudolf S. Watje is



AXEL E. JOHNSON

labor foreman. Engineer on the project is Robert Gewe, auditor is R. G. Barnes and paymaster is W. R. Focht.

K. MacIsaac is general superintendent for MacIsaac and Menke Co., Los Angeles, on the office building and storage warehouse they are constructing for Joseph T. Ryerson & Son, Inc., in Los Angeles. H. M. (Scottie) Buntain is assistant superintendent and Bert Broadhurst is carpenter foreman. Representing the architect, A. C. Martin, is W. C. (Sam) Stoops, and the western sales manager representing the Ryerson firm is Col. O. K. Graef.

S. A. Johnson is general superintendent for the Baruch Corp. on the \$2,000,000 May Co. service building at Jefferson and Grand Ave., Los Angeles. Engineer on the project is I. S. Weddell; Charles P. Page is carpenter foreman; Jim Norman, labor foreman; P. D. Benson, office manager, and Steve Hardgrove, purchasing agent. Representing the May Co. for architect A. C. Martin is Frank Martin.

Britt Pugh is general superintendent on a \$508,837 grading and surfacing job between 6 mi. N. of Red Bluff and Shasta Co. line in Tehama Co., Calif. Walt Schallock is grading foreman, Bill Perry is paving superintendent, Jim Mitchell is engineer, and Al Keithley is purchasing agent. The contract is held by Oilfield Trucking Co. and Phoenix Construction Co., Bakersfield, Calif.

R. R. Mitchell is job superintendent for G. W. Mitchell of San Antonio, Tex., on a \$110,635 contract to build a three-story and mezzanine building on S. Flores St. in San Antonio. F. H. Oats of Kerrville, Tex., is job superintendent for the Mitchell Co. on an office and warehouse building in Kerrville.

Bill J. Clark, formerly assistant to the master mechanic on the \$2,768,432 construction of levees and bypass on Lytle and Cajon Creeks, San Bernardino, Calif., has been promoted to master mechanic on the project. The contract is held by Win-

ston Brothers Co., Minneapolis, Minn., Utah Construction Co., San Francisco, Calif., and A. S. Vinnell Co., Alhambra, Calif.

A. E. Johnson, during the war an Army colonel, is resident manager of construction on a group of buildings Platt Rogers, Inc., Pueblo, Colo., is putting up at Boulder for Colorado University. The contract for a dormitory, five residence halls, club wing and service building is worth more than a million dollars. Johnson's assistant is H. E. Snow, a former lieutenant colonel in the U. S. Engineers, and general superintendent is Floyd Gray.

C. A. Burrell is project superintendent for Baruch Corporation of Los Angeles on the movement, erection and conversion of 750 Quonset huts into 1,500 dwelling units at Griffith Park, Los Angeles. One of the FPHA projects, the job will cost \$3,081,000. John F. Hickey is project manager and Samuel C. Harris is purchasing agent.

J. S. Wright is now job superintendent for McCann Construction Co. of Fort Worth, Tex., on their FPHA job of moving 120 dwelling units from Orange, Tex., to Fort Worth, to provide veteran housing. "Jim" Wright was formerly with Morrison-Knudsen Construction Co. of Boise, Ida.

Lloyd W. Miller is job superintendent on a \$113,332 job of dense graded surfacing of 36.99 mi. of highway in Logan Co., Kans., for the San-Ore Construction Co. of McPherson, Kans. Production superintendent for the job is Charles A. Nickel, manipulation foreman is Lawrence Sanke, and road oil foreman is Carl A. Morginson.

C. L. Stanley is job superintendent for John Cunningham Construction Co. of San Antonio, Tex., on the \$164,000 Royal Crown bottling plant, warehouses, garage and repair shop in San Antonio. John Hadden is assistant superintendent and Pat Barnett is purchasing agent and coordinator.

Jack N. McPhee and E. G. Shaver are job superintendent and purchasing agent, respectively, for Del E. Webb Construction Co., Phoenix, Ariz., on a warehouse and merchandising building under construction at 7th and Grant Sts., Phoenix, costing \$450,000.

Roger Neal is general field superintendent for Stronach Construction Co. of Los Angeles on all work. On the nine-story class A Gerry Building at 910 S. Los Angeles St., W. L. Davis is general superintendent, John Redford is general foreman, C. R. Janovee is labor foreman and Abe Horowitz is office manager.

Ray Weist is acting as job superintendent, with Jake Seitz as assistant superintendent, for Carbon Bros. of Spokane, Wash., on the grading, surfacing and stockpiling on Highway No. 11, Sage-moore to Connell in Franklin Co., Wash. The job will cost \$233,276.

W. F. Rennebohm is job superintendent on a \$1,228,841 job constructing earthwork, concrete lining and structures for Coachella Canal near Indio, Calif., part of the



FLOYD GRAY

Boulder Canyon Project. Hank Ewert is assistant superintendent, John Rien is night superintendent and Walter Evans is office manager. The Shea Co. and Morrison-Knudsen Co., Inc., of Los Angeles have the contract.

Robert B. Lefevre and L. A. Lefevre of North Hollywood, Calif., are job superintendent and purchasing agent, respectively, on a two-story parochial grammar school the latter is building on Moorpark St. in North Hollywood. The building will cost \$250,000.

Don Boots is superintendent and Lucian Halloway is job office manager for Sound Construction & Engineering Co. of Seattle, Wash., on the grading of the Berger Ranch-Barnes Rd. section of Wolf Creek highway in Josephine Co., Ore. The contract was awarded at \$150,759.

Adolf Brandt is in Boron, Calif., as superintendent for contractor E. S. McKittrick on construction of houses, dormitory, garages, sewage disposal system, complete water system, streets and paving for the Pacific Coast Borax Co. General foreman there is E. L. Hollibaugh.

Ed Pearson is job superintendent for Big Horn Construction Co., Sheridan, Wyo., on \$348,499 worth of highway improvement on the Tensleep-Buffalo road. With Pearson are John Frey, Angelo Weir and Charles Von Hatten in key positions.

James L. Brewer is foreman for Waco Steel and Erection Co. of Los Angeles on various projects, including the Butay Products building in Los Angeles. R. P. Saville is foreman for A. V. Sullivan, road contractor, on Butay's plant in Los Angeles, which is under construction.

H. L. Foster, with the U. S. Engineers for several years, is again active with the construction firm, Carroll & Foster, of San

Diego, Calif., and is superintendent on their 6th St. bridge construction job over San Diego river. Frank Davis represents the sub-contractors, Raymond Concrete Pile Co., and H. R. Lendecke is engineer on the project.

Arthur C. Nauman is in Spokane, Wash., with the Clyde M. Ludberg Co. as job superintendent for a \$150,000 wood flour manufacturing plant for Specialty Wood Products, Inc. Foremen are Joe Strang and Olaf Larson, and office manager is William W. Wheatley.

Tom Scott is acting as job superintendent on construction of a reinforced concrete winery plant in Fresno, Calif. Ed Jones is concrete foreman and G. A. Graham is project manager. Trewhitt, Shields and Fisher of Fresno has the \$650,000 contract.

A. S. Roscoe is supervising a \$1,250,000 private housing project Roscoe & Land, Los Angeles, Calif., are building at Pima Rd. and Maple Blvd. in Tucson, Ariz. His assistant superintendent is Paul Broman, and R. G. Walters is doing the purchasing.

Lou Meyers is with MacDonald, Young & Nelson of San Francisco on construction of a \$95,000 garage and auto sales building on California Dr. in Burlingame, Calif. Fred Thierry is concrete foreman and Ken Gooding is timekeeper.

A. R. Lauch is project manager on a civil engineering laboratory building Century Construction Co. of Seattle is building for the University of Washington. M. Syliaasen is structural engineer and L. L. Wood is superintendent.

S. S. Tracy, now at Mad River in Humboldt Co., Calif., is job superintendent there for Mercer-Fraser Co. of Eureka, on construction of a \$204,868 steel girder bridge and road approaches. Jack Molte is engineer and Ed Johnson is foreman.

M. B. Edwards is job superintendent on the Edwards Brothers' construction of a \$125,000 agricultural equipment agency one mile south of Albany, Ore. Marty Edwards, Jr., is foreman on the job. The firm is located at Albany.

R. H. (Bob) Laws from the San Francisco office of Raymond Concrete Pile Co., is supervising work for that company in the Los Angeles area. One of the largest foundation jobs there is the new Rexall Drug building.

L. E. Herrick, formerly a key man with R. E. Campbell of Los Angeles, is now job superintendent for Modern Builders of Long Beach, Calif., on a food locker building in Long Beach.

W. H. Willits, working in Seattle for Geo. E. Teufel, contractor, is supervising construction of a \$250,000 two-story store building at 5th Ave. and Pike St. Geo. I. Teufel is engineer for the project and W. H. Knox is office manager.

Ace Barnett is with Los Angeles' Baruch Corporation as job superintendent on a \$565,000 medical building going up on Wil-



ARTHUR C. NAUMAN

shire Blvd. in Los Angeles. Bill Timmers is carpenter foreman and Ed Tutton is labor foreman.

Joe Bustard of Jeannerett Construction Co., Long Beach, Calif., is supervisor on an almost completed derrick being erected by Columbia Wire & Iron Co., Portland, Ore., outside of Portland for Richfield Oil Corp.

A. J. Schwitter is in Seattle with the Atherton Construction Co. as general superintendent on a concrete and brick fireproof building at N. 38th and Stone Way. Arthur L. Atherton is project manager and Sam Berry is labor foreman.

Johnny Card, formerly in key positions for Shannahan Bros. at Fallbrook, Calif., and Concrete Ship Constructors at San Diego, is now supervising construction for Moran Construction Co. of San Diego.

Ole Remmon is superintendent and V. O. Brunzell is manager on the administration and classroom buildings Brunzell is building at 13061 Riverside Dr., Van Nuys, Calif., for \$122,769.

Joe C. Henson, partner of contractor W. J. Henson of Prescott, Ariz., is job superintendent on the Show-Low to Holbrook highway the firm is constructing in Navajo Co., Ariz., for \$474,734.

Charles S. Reed, formerly a key engineer on the Lytle Creek Project at San Bernardino, Calif., for Bressi Bevanda and Macco, is now construction supervisor and estimator for S. N. Benjamin, general contractor of Los Angeles.

Ed Hauser is job superintendent for R. J. Daum, Inglewood, Calif., on a \$170,000 two-story reinforced concrete semi-industrial building going up at Romaine St. and Highland Ave. in Los Angeles.

Alex B. Levy is job superintendent for E. B. Darby & Co. on the widening of con-

crete pavement on U. S. Highway 281 in Brooks Co., Tex. Charles Chambers is concrete foreman and Ervin Cole is grade foreman on the \$112,609 job.

Clay Sloane is superintendent on all work for J. N. Swigert Co. of Los Angeles, Calif., who has the excavation work on Bullocks-Pasadena. Fred Blakee is job superintendent on the project.

P. O. Peterson is job superintendent, P. O. Johanson is carpenter foreman and W. F. Slezak is steel foreman on the \$225,000 addition to the Seattle Labor Temple, under contract to J. B. Warrack Construction Co., Seattle, Wash.

Howard L. Porter is general superintendent for William P. Neil of Los Angeles on the new Ford plant under construction in Maywood, Calif. R. W. Powers is field engineer for the company.

George B. Davis is superintendent and Floyd Lindsey timekeeper on the new Holman building at 925 S. Maple St., Los Angeles, Calif., for H. W. Baum & Co., contractors.

Herman Deaton is job superintendent for R. W. McKinney of Nacogdoches, Tex., on the surfacing of Highway 148 in Jack Co., costing \$90,981. Other key men on the project are J. D. Thomas and O. S. Lawrence.

Jerry Calloway, contrary to a report in *Western Construction News*, January, 1946, has been rock quarry foreman since November, 1945, for Winston-Utah-Vinnell at San Bernardino, Calif.

William Crane is job superintendent for the Austin Co., Los Angeles, on buildings for Premier Oil & Lead Works going up across the street from their present plant in Los Angeles.

George E. Dawson is assistant foreman on plant construction in Riverside, Calif., for contractor Edward Siple of Los Angeles. Dawson was formerly in Reno, Nev., with Close and Lewis.

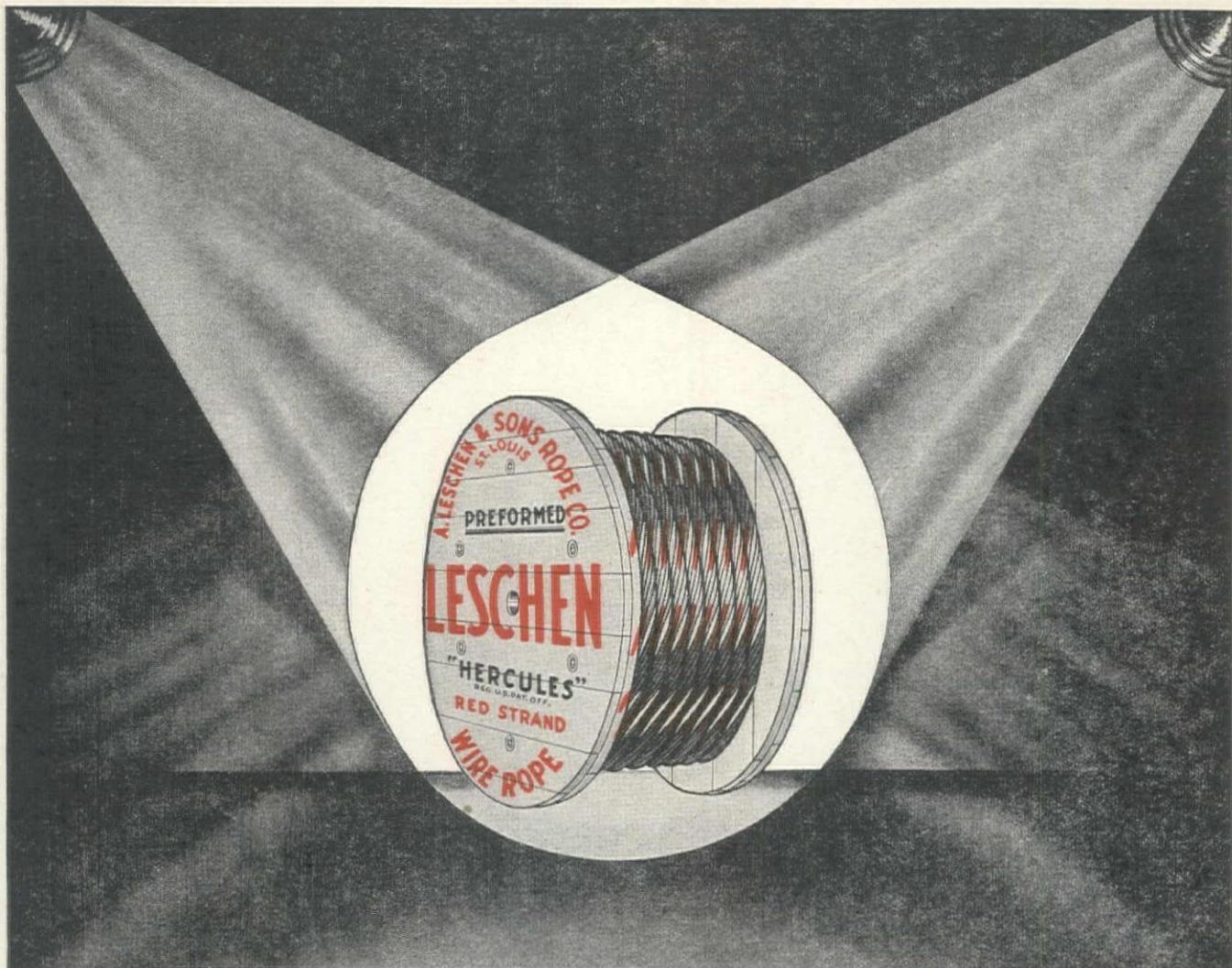
Arthur Ackland is superintendent for Kenneth P. Schmidt of Glendale, Calif., on construction of a \$100,000 market building at 200 N. Garfield Ave. in Alhambra, Calif.

Leonard Lund is job superintendent for Stolte, Inc., of Oakland, Calif., on the \$125,000 cold storage plant under construction at Hood, Calif.

Jack McLeod is superintendent of construction for Howard S. Wright Co. on a building for the Good Will Assn. in Seattle, Wash.

George K. Thatcher is with Byerts & Dunn of Los Angeles, Calif., as superintendent of the \$128,290 overcrossing at 4th St. on the Santa Ana Parkway.

Jack Carte, formerly with Siems-Drake construction firm in Alaska, is now associated with Arrow Electric Co., Seattle, Wash.



In the Spotlight!

Outstanding performance always wins recognition and acceptance...In the field of Wire Rope, "HERCULES" (Red-Strand) long ago won its place "In The Spotlight" because of its uniform reliability and economy in every industry that calls for "heavy duty" action.

You won't go wrong when you adopt the **Red-Strand** as your buying guide for wire rope. As "HERCULES" is furnished in both Round Strand and Flattened Strand construction, and in either the Preformed or Non-Preformed type—you are assured of adaptability as well as of high quality.

Ask our Engineering Department to recommend the type and construction best suited to your needs.

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS
5909 KENNERLY AVENUE

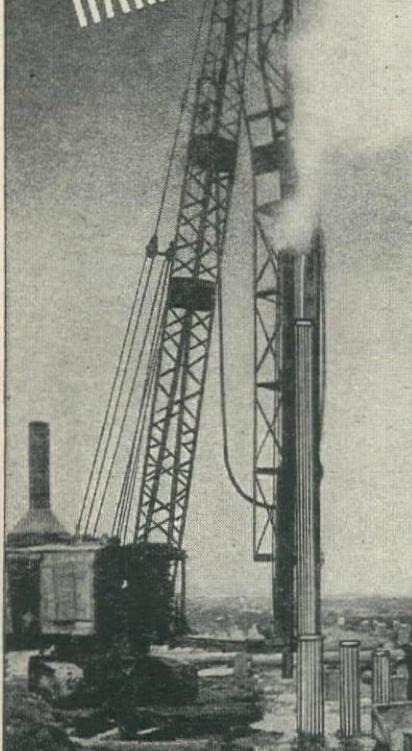
NEW YORK 6 • • • 90 West Street
CHICAGO 7 • • 810 W. Washington Blvd.
DENVER 2 • • • 1554 Wazee Street

ESTABLISHED 1857
ST. LOUIS 12, MISSOURI, U. S. A.

SAN FRANCISCO 7 • • 520 Fourth Street
PORTLAND 9 • • 914 N. W. 14th Avenue
SEATTLE 4 • • • 3410 First Avenue South



DOUBLE-ACTING UNION HAMMERS...



ALL the essential facts about Union double-acting hammers and how they increase the efficiency of all your pile driving jobs, are contained in our Catalog No. 184. Write for it today.

UNION IRON WORKS
INCORPORATED
Established 1900
ELIZABETH B. NEW JERSEY
Export Office - 50 Church St., New York 7, N.Y.
Cable Address - Brosites

UNIT BID SUMMARY

Irrigation . . .

Oklahoma—Jackson Co.—Bur. of Reclam.—Earthwork and Struct.

Luther Bros. Construction Co., of Fort Worth, Tex., submitted the low bid of \$255,482 to the Bureau of Reclamation for earthwork and structures on the Altus main canal and the laterals and sub-laterals of the Lugert-Altus project. The bid of the Groves Co. was opened at Denver, instead of at the project office, after a check with the postoffice showed that it had been mailed in time to reach the project office in time for opening with the others. It was not, however, low. The unit bids follow:

	Schedule No. 1	Schedule No. 2	Total
(A) Luther Bros. Construction Co.	\$120,757	\$134,725	\$255,482
(B) James & Phelps Construction Co.	127,403	160,730	288,133
(C) Stamey Construction Co.	117,013	189,522	306,535
(D) Ottlinger Bros. Construction Co.	129,548	-----	-----
(E) Stebbins Construction Co.	150,796	181,370	332,166
(F) Austin Bridge Co.	159,628	181,187	340,815
(G) S. J. Groves & Sons Co.	144,127	220,963	365,090
(H) Morrison-Knudsen Co., Inc.	177,392	242,526	419,918
(I) Kiewit-Amis-Cunningham	191,485	273,490	465,075

SCHEDULE No. 1

- (1) 213,000 cu. yd. excavation for canal.
- (2) 260,000 sta. cu. yd. overhaul.
- (3) 22,000 cu. yd. compacting embankments.
- (4) 2,500 cu. yd. excavation for drainage channels and dikes.
- (5) 10,000 cu. yd. excavation for structures.
- (6) 2,500 cu. yd. backfill.
- (7) 1,200 cu. yd. compacting backfill.
- (8) 1,625 cu. yd. concrete in structures.
- (9) 221,000 lb. placing reinforcement bars.
- (10) 15 lin. ft. placing rubber water stops in joints.
- (11) 110 sq. ft. placing elastic joint filler in joints.
- (12) 200 sq. yd. dry-rock paving.
- (13) 27 M.F.B.M. erecting timber in structures.
- (14) 56 lin. ft. laying 24-in. diam. concrete pipe.
- (15) 72 lin. ft. laying 30-in. diam. conc. pipe.
- (16) 400 lb. placing metal water stops in joints.
- (17) 5,200 lb. installing gates.
- (18) 4,000 lb. installing miscel. metalwork.

SCHEDULE No. 2

- (19) 160,000 cu. yd. excavation for laterals.
- (20) 100,000 sta. cu. yd. overhaul.
- (21) 5,000 cu. yd. compacting embankments.
- (22) 2,500 cu. yd. excav. for drainage channels and dikes.
- (23) 15,000 cu. yd. excavation for structures.
- (24) 12,000 cu. yd. backfill.
- (25) 7,000 cu. yd. compacting backfill.
- (26) 1,800 cu. yd. concrete in structures.
- (27) 148,000 lb. placing reinforcement bars.
- (28) 1,500 sq. yd. dry-rock paving.
- (29) 28 M.F.B.M. erecting timber in structures.
- (30) 650 lin. ft. laying 18-in. diam. concrete pipe.
- (31) 2,000 lin. ft. laying 24-in. diam. conc. pipe.
- (32) 900 lin. ft. laying 30-in. diam. conc. pipe.
- (33) 500 lin. ft. laying 36-in. diam. conc. pipe.
- (34) 240 lin. ft. laying 42-in. diam. conc. pipe.
- (35) 450 lb. placing metal water stops in joints.
- (36) 46,500 lb. installing gates.
- (37) 6,000 lb. installing miscel. metalwork.

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1) .....	.185	.25	.18	.195	.31	.25	.26	.23
(2) .....	.017	.015	.02	.0225	.02	.016	.02	.01
(3) .....	.15	.06	.05	.13	.12	.10	.05	.10
(4) .....	.29	.25	.30	.35	.34	.30	.30	.35
(5) .....	.75	.50	.75	.80	.80	1.25	.75	1.75
(6) .....	.40	.25	.25	.50	.40	.35	.50	.40
(7)	1.05	1.00	1.00	.50	.80	2.00	.50	1.15
(8)	31.00	30.00	30.00	33.00	32.00	46.00	35.00	46.75
(9) .....	.035	.04	.04	.04	.04	.025	.03	.045
(10)	1.00	1.00	1.00	.30	.40	.40	3.00	1.25
(11)	1.00	.20	1.00	.10	.60	.20	.05	1.25
(12)	4.50	4.00	4.00	6.00	5.00	3.50	3.00	4.10
(13)	80.00	60.00	75.00	130.00	80.00	60.00	125.00	72.00
(14)	2.00	1.00	2.50	2.50	3.00	1.15	2.50	1.50
(15)	2.00	2.50	2.75	3.00	3.00	1.75	3.50	2.40
(16) .....	.30	.20	.25	.14	.20	.07	.25	.50
(17) .....	.13	.10	.10	.08	.15	.06	.25	.20
(18) .....	.20	.15	.20	.14	.20	.085	.25	.22
(19) .....	.20	.30	.35	.42	.25	.47	.38	.35
(20) .....	.017	.015	.02	.025	.016	.02	.02	.01
(21) .....	.24	.06	.05	.14	.10	.05	.55	.10
(22) .....	.20	.30	.30	.40	.30	.50	.40	.35
(23) .....	.75	.50	.75	.75	1.25	1.00	1.60	3.20
(24) .....	.20	.25	.25	.30	.35	.50	.32	.70
(25) .....	.80	.75	1.00	.60	2.00	.50	1.05	.70
(26)	31.00	35.00	43.00	33.50	46.00	45.00	60.50	65.80
(27) .....	.035	.04	.04	.04	.025	.03	.05	.03
(28)	3.00	4.00	4.00	4.00	2.50	2.50	3.60	7.50
(29)	80.00	60.00	75.00	50.00	60.00	125.00	72.00	130.00
(30)	1.00	1.00	1.50	2.00	.70	1.50	.90	1.40
(31)	1.50	2.00	2.00	2.00	1.15	2.50	1.05	1.50
(32)	2.00	4.00	2.50	2.10	1.75	3.00	1.75	1.90
(33)	2.50	5.00	3.00	2.40	2.15	4.00	2.25	2.40
(34)	3.00	6.00	3.50	2.50	3.00	5.00	3.50	3.00
(35) .....	.30	.20	.25	.30	.07	.25	.50	1.40
(36) .....	.08	.10	.15	.15	.06	.25	.20	.15
(37) .....	.18	.15	.20	.20	.085	.25	.22	.15

California—Modoc County—Bur. of Reclam.—Earthwork and Struct.

Clifford A. Dunn and Slate Construction Co., Klamath Falls, Ore., with a proposal of \$145,558, was low bidder to the Bureau of Reclamation on construction of earthwork and structures on canals and drains at Coppee Bay, a portion of the Modoc unit of the Klamath irrigation project in Oregon-California. The following unit bids were submitted:

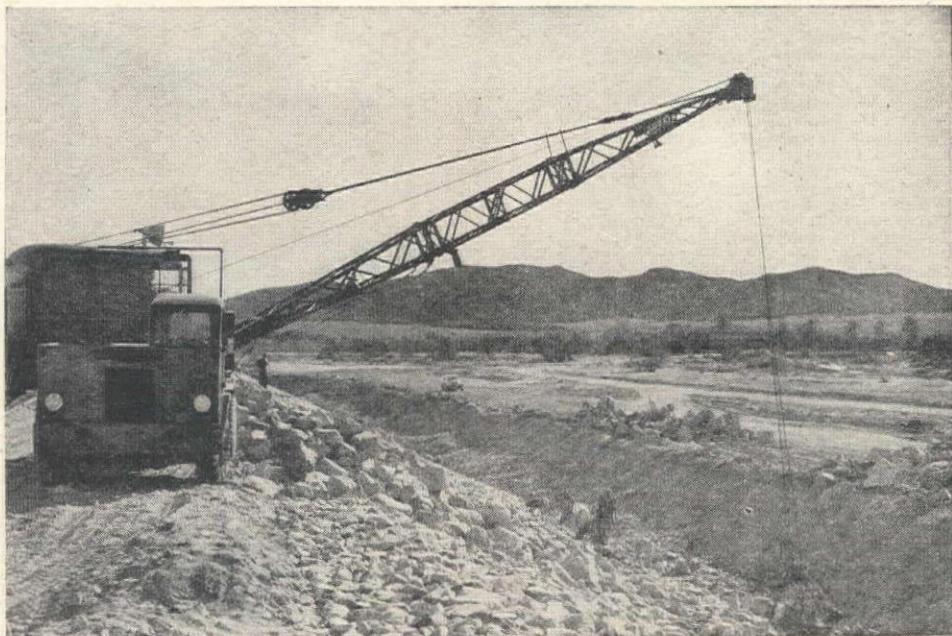
(1) C. A. Dunn & Slate Construct. Co.	\$145,558	(4) George R. Stacy	\$182,262
(2) Kuckenberg Construction Co.	163,875	(5) Morrison-Knudsen Co., Inc.	186,187
(3) Marshall & Haas	174,289	(6) Fred J. Maurer & Son	307,839
(1) 321,000 cu. yd. excav., common, canals and laterals	.13	.16	.20
210,000 cu. yd. excav., common, drains only	.12	.16	.13
20,000 cu. yd. excav., common, cut-off trench	.11	.25	.20
7,000 cu. yd. excav., rock, canals and drains	1.05	2.50	3.30
13,000 cu. yd. excav., common, embankment borrow	.15	.40	.18
1,500 cu. yd. excav. for core banks	.25	.60	.30
2,000 cu. yd. excav., common, for structures	3.00	.75	2.75
100 cu. yd. excav., rock, for structures	6.00	3.00	10.00
5,000 sta. cu. yd. overhaul	.02	.05	.10

(Continued on next page)

WINSTON-UTAH-VINNELL CO. USE LORAIN MOTO-CRANE ON CALIFORNIA FLOOD CONTROL PROJECT

*watch
LORAINS
GO!*

The versatility of the rubber-tired Lorain Moto-Crane is demonstrated by this MC-414, owned by Winston-Utah-Vinnell Co. of San Bernardino, California. The unit is shown here doing rubble work on the face of a dyke on the Lyle Creek Flood Control project in Cajon Pass near San Bernardino.



Behind the machine on this job is one of the best-equipped, best-trained organizations of its kind . . . your Thew-Lorain Distributor. When selecting your next shovel-crane, be sure to consider the value of the Lorain Distributor to you. First, your Lorain Distributor can help you select the best machine for your present and future jobs. His line is complete and he understands job application. Second, he will save you costly delays by delivering "Lorain parts with Factory

Warranty" to your job at once. Should you need mechanical work of any kind, he is equipped with the right tools to speed the work and save you money. When you own Lorains, your job is backed up by the best in parts, service and honest quality. Your nearest Thew-Lorain Distributor is listed below . . . it will pay you to make them your "shovel-crane" headquarters. Why not visit them soon?

THE THEW SHOVEL COMPANY, LORAIN, OHIO

CRANES • SHOVELS • DRAGLINES • CLAMSHELLS • MOTO-CRANES

*See Your
thew-
Lorain
Dealer*

Le Roi-Rix Machinery Co., Los Angeles 11
Cate Equipment Co., Salt Lake City 4
Liberty Trucks & Parts Co., Denver 1
Coast Equipment Company, San Francisco 1
A. H. Cox & Co., Seattle 4, Washington
Bunting Tractor Co., Inc., Boise, Twin Falls, Gooding,
Fairfield, and Burley, Idaho; LaGrande, Oregon
Connelly Machinery Company, Billings and Great Falls, Montana
Sanford Tractor & Equipment Co., Reno, Nevada
The Mountain Tractor Co., Missoula, Montana
The Tractor & Equipment Co., Sidney, Montana
P. L. Crooks & Co., Portland 10, Oregon

Worthington-Ransome Blue Brute Distributors

See ad on page 129 for list of equipment in each line

Worthington-Ransome Distributors

Ala., Birmingham, J. D. Pittman Tractor Company
Montgomery, Burford-Toothaker Tractor Co.
Alaska, Anchorage Airport Mach. & Storage Co.
Cal., San Francisco, Coast Equip. Co.
Los Angeles, Golden State Equip. Co.
Colo., Denver, Power Equipment Company
Conn., N. H. Wilhelm-Davies Co., Inc.
Fla., Miami, Allied Equip., Inc.
Orlando, Highway Equip. & Supply Company
Tampa, Epperson & Company
Ga., Atlanta, Tractor & Machinery Company
Ida., Boise, Olson Manufacturing Company
Ill., Chicago, Chicago Construction Equipment Co.
Maine, Portland, Maine Truck-Tractor Company
Mass., Boston, Clark-Wilcox Co.
Mich., Iron River, Drott Tractor Co., Inc.
Muskegon, Lakeshore Machy. & Supply Co.
Minn., Minneapolis, Phillipi-Murphy Equip. Co.
Miss., Jackson, Jackson Road Equip. Co.
Mo., Clayton, The Howard Corporation
Montana, Billings, Interstate Truck & Equip. Co.
Helena, Caird Eng. Works
N. M., Albuquerque, Bud Fisher Co.
N. Y., Albany, Milton-Hale Machinery Company
New York, Hodge & Hammond, Inc.
N. D., Fargo, Smith Commercial Body Works, Inc.
Ohio, Cincinnati, Carroll Edwards Co.
Okla., Oklahoma City, Townsco Equip. Company
Oregon, Portland, Andrews Equip. Service
S. C., Columbia, Smith Equipment Company
S. D., Sioux Falls, Phillipi Murphy Equip. Co.
Tenn., Knoxville, Dempster Bros., Inc.
Tex., Amarillo, T. W. Carpenter Equip. Co.
Dallas, Shaw Equipment Company
Utah, Salt Lake City, J. K. Wheeler Mach. Co.
Vt., Barre, A. M. Flanders, Inc.
Wash., Spokane, Andrews Equip. Service
Wisc., Milwaukee, Drott Tractor & Equip. Co., Inc.

Ransome Distributors

Ariz., Phoenix, Lee Redman Company
Ark., Little Rock, Kern-Limerick, Inc.
D. C., Washington, M. A. Doetsch Mach. Company
Ill., Chicago, Thomas Hoist Company
Ind., Fort Wayne, American Steel Supply Co.
Ky., Paducah, Henry A. Petter Supply Company
La., New Orleans, Ole K. Olson Company
Md., Baltimore, Stuart M. Christlif & Company
Mich., Detroit, T. G. Abrams
Mo., Kansas City, Brown-Strauss Corp.
Neb., Lincoln, Highway Equip. & Supply Co.
N. J., Newark, Johnson & Dealeman
N. C., Raleigh, Smith Equip. Company
Ohio, Cleveland, H. B. Fuller Equip. Company
Pa., Philadelphia, Giles & Ransome
Wilkinsburg, Arrow Supply Co.
Tex., El Paso Mine and Smelter Supply Company
Houston, McCall Tractor & Equip. Company
W. Va., Charleston, Clyde P. Beckner, Inc.

Worthington Distributors

Ark., Fort Smith, R. A. Young & Son
Little Rock, R. A. Young & Son
Ind., Indianapolis, Heid-Holcomb Company
Iowa, Des Moines Electrical Eng. & Const. Co.
Ky., Harlan Hall Equipment Sales Company
Louisville, Williams Tractor Company
La., New Orleans, Wm. F. Surgi Equip. Company
Md., Baltimore, D. C. Elphinstone, Inc.
Mass., Cambridge, Field Mach. Company
Mich., Detroit, W. H. Anderson Co., Inc.
Flint, Gransden-Hall & Company
Mo., Kansas City, Mach. & Supplies Co.
N. J., Hillsdale, P. A. Drobach
No. Bergen, American Air Compressor Corp.
N. M., Roswell, Smith Machinery Company
N. Y., Buffalo, Dow & Co., Inc.
New York, Air Compressor Rental & Sales
Olean, Freeborn Equip. Company
N. C., Raleigh, Carolina Tractor & Equip. Co.
Ohio, Cleveland, Gibson-Stewart Company
Toledo, The Kilcorse Mach. Co.
Pa., Allentown, H. N. Crowder, Jr., Inc.
Easton, Sears & Bowers
Harrisburg, American Equip. Corp.
Oil City, Freeborn Equipment Company
Philadelphia, Metalweld, Inc.
Pittsburgh, Atlas Equip. Corp.
Wilkes-Barre, Ensminger & Company
Tex., El Paso, Equip. Supply Company
San Antonio, Patten Machinery Company
Va., Richmond, Highway Mach. & Supply Co.
Wash., Seattle, Star Machinery Company
W. Va., Fairmont, Interstate Engineers & Constr.
Incorporated
Wyoming, Cheyenne, Wilson Equip. & Supply Co.

Buy Blue BRUTES

Worthington Pump and Machinery Corp.
Worthington-Ransome Construction
Equipment Division
Holyoke, Massachusetts

3,800 cu. yd. earth lining in canal	1.00	.35	.50	.35	1.10	1.50
15,000 mi. cu. yd. haul earth lining material	.15	.20	.25	.25	.23	.20
3,100 cu. yd. backfill	.90	.25	1.00	1.00	.35	2.00
1,300 cu. yd. compacting backfill	1.50	1.00	1.00	2.50	2.35	.50
650 sq. yd. dry-rock paving	6.00	3.00	4.10	3.75	4.40	5.00
290 cu. yd. conc. in structures	57.00	50.00	55.00	50.00	55.00	45.00
24,500 lb. placing reinf. bars	.06	.04	.07	.06	.04	.02
175 M.F.B.M. erecting timber in structures	80.00	50.00	66.00	60.00	84.50	100.00
5,900 lin. ft. driving timber piles	1.40	1.50	1.00	2.50	1.75	1.00
9.4 M.F.B.M. mfg and driving sheet piling	150.00	100.00	100.00	500.00	130.00	150.00
380 lin. ft. laying 24-in. conc. pipe	1.50	1.50	2.75	2.50	1.60	2.00
16 lin. ft. laying 30-in. conc. pipe	2.00	4.00	4.00	4.00	2.00	3.00
624 lin. ft. laying 18-in. corr. metal pipe	1.00	1.00	1.35	1.20	.75	2.00
80 lin. ft. laying 24-in. corr. metal pipe	1.25	1.50	1.65	1.50	.90	3.00
84 lin. ft. laying 30-in. corr. metal pipe	1.50	2.50	2.25	2.00	1.00	3.50
452 lin. ft. laying 36-in. corr. metal pipe	1.75	4.00	3.30	3.00	1.20	3.00
174 lin. ft. laying 48-in. corr. metal pipe	2.50	6.00	5.00	4.50	1.50	4.50
14,500 lb. installing gates and misc. metalwork	.07	.10	.11	.10	.20	.30

Utah—Wasatch County—Bur. of Reclam.—Steel Pipe

Carl B. Warren, with a bid of \$442,751, was low to the Bureau of Reclamation, on construction of a steel pipe line and concrete structures on four sections of the Salt Lake Aqueduct and the Provo river crossing, and he was awarded the contract. The units bids were as follows:

(1) Carl B. Warren	\$442,751	(4) Gibbons & Reed Co.	\$498,886
(2) R. A. Wattson	456,535	(5) Tom L. Gogo	568,206
(3) Utah Construction Co.	462,625		

	(1)	(2)	(3)	(4)	(5)
123,000 cu. yd. excav., common, for pipe trenches	.31	.76	.60	.31	1.10
5,500 cu. yd. excav., rock, for pipe trenches	1.18	6.50	3.00	5.30	2.50
500 cu. yd. excav., common, for structures	2.04	1.75	2.50	2.65	2.50
50 cu. yd. excav., rock, for structures	4.04	10.00	6.00	5.40	3.00
1,000 cu. yd. excav. for drainage channels, dikes, blow-off piping	.28	1.40	1.00	2.20	1.00
1500 cu. yd. compacted embankment	1.98	1.65	.60	.80	1.50
105,000 cu. yd. backfill	.31	.52	.40	.36	.40
22,000 cu. yd. compacting backfill	1.74	1.85	1.50	2.95	2.50
200 sq. yd. dry-rock paving	4.84	4.00	5.00	3.40	5.00
Lump sum, hauling, placing, field welding, coating and testing plate-steel pipe	204,009	121,000	190,000	228,000	194,066
10,000 ton miles overhaul of plate-steel pipe	.12	.35	.30	.20	.80
1,800 cu. yd. concrete in structures	48.50	37.50	40.00	35.00	50.00
130,000 lbs. furnishing and placing reinf. bars in structures	.09	.10	.09	.10	.07
67 lin. ft. construction of 60-in. culvert	29.50	15.00	25.00	33.00	20.00
38,000 lbs. furnishing and installing miscel. metalwork	.35	.40	.25	.34	.30
20,000 lbs. installing blow-off piping	.10	.20	.15	.08	.08
Lump sum, installing valves	385.00	\$4,000	\$2,000	500.00	\$1,000

Bridge and Grade Separation...

California—Los Angeles County—State—Overhead

E. W. Elliott Construction Co., San Francisco, with a bid of \$849,357, was low in bidding before the Division of Highways, Sacramento, on construction of a structural steel overhead over the tracks of the Union Pacific, Southern Pacific, and Pacific Electric railways at Anaheim St. in the city of Los Angeles, Wilmington district. The overhead is a part of the Terminal Island Freeway. The following unit bids were offered:

(1) E. W. Elliott Construction Co.	\$849,357	(5) Guy F. Atkinson Co.	\$ 905,030
(2) Peter Kiewit Sons' Co.	892,606	(6) Baruch Corp.	971,676
(3) E. B. Bishop	897,226	(7) Robert E. McKee	972,336
(4) Macco Construction Co.	897,732	(8) Griffith Co.	1,014,069

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
9,000 cu. yd. structure excav.	2.20	4.75	2.00	4.25	2.50	2.10	5.30	5.00
8,300 cu. yd. Cl. "A" P.C.C.	28.00	30.00	29.00	30.00	30.00	29.00	32.00	
4,094,000 lbs. furn. struct. steel	.08	.08	.09	.08	.08	.1026	.093	.092
4,094,000 lbs. erecting struct. steel	.016	.02	.0125	.02	.025	.0139	.025	.025
75,160 lin. ft. furn. timber piles	.50	.55	.50	.45	.50	.53	.54	.60
1,668 ea. driving timber piles	25.00	15.00	24.00	27.00	20.00	23.70	14.00	20.50
3,770 lin. ft. furn. steel piles	2.00	2.25	2.00	2.00	2.00	2.14	2.18	2.15
58 ea. driving steel piles	48.00	40.00	40.00	50.00	35.00	28.50	50.00	35.50
40 ea. steel pile splices	25.00	22.50	12.00	25.00	15.00	19.95	33.00	15.00
1,622,000 lbs. furn. bar reinf.	.045	.042	.0475	.04	.045	.043	.044	.043
1,622,000 lbs. placing bar reinf.	.0125	.014	.015	.02	.015	.0217	.016	.022
3,566 lin. ft. steel railing	4.00	4.00	4.00	4.00	5.00	5.70	4.50	5.10
Lump sum, electrical equip.	\$3,500	\$7,300	\$6,000	\$6,000	\$6,000	\$7,370	\$8,400	\$8,400
Lump sum, miscel. items	\$2,500	\$1,000	\$1,000	\$1,500	\$1,400	\$4,300	\$2,700	\$2,400

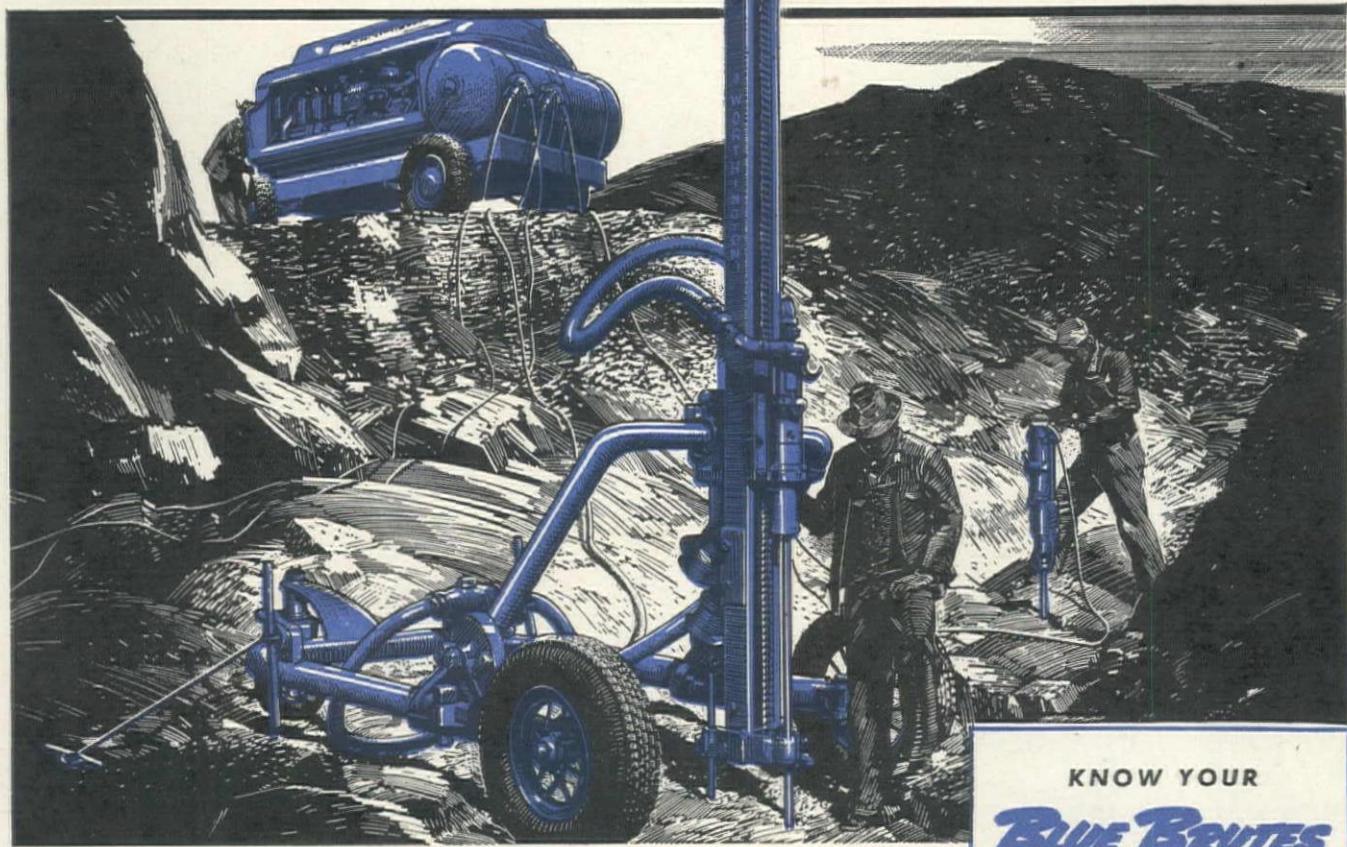
Washington—Whatcom Co.—State—Reinf. Conc.

C. B. Croy, Bellingham, submitted the lowest bid, \$94,685, to the Washington Department of Highways, Olympia, and was awarded the contract to construct a reinforced concrete pile and slab bridge over the Nooksack river at Nugent's Bridge, and improvement of about 0.5 mi. of bridge approaches. There is also a flat slab bridge over the Nooksack river overflow channel. The unit bids submitted were as follows:

(1) C. B. Croy	\$ 94,685	(4) R. L. Moss & Co.	\$123,715
(2) C. V. Wilder Co.	95,664	(5) Cascade Contractors, Inc.	124,576
(3) M. P. Munter Co.	117,214	(6) A. W. Stevens Construction Co.	129,821
	(1)	(2)	(3)
Lump sum, clearing and grubbing	500.00	800.00	490.00
24,720 cu. yd. unclass. excav., incl. haul	.45	.60	.76
40 cu. yd. common trench excav., incl. haul	1.00	1.50	1.80
360 cu. yd. structure excav.	1.00	1.50	3.00
765 lin. ft. slope treatment	.15	.10	.17
20.5 stas. (100 ft.) finishing roadway	10.00	12.00	20.00
3,350 cu. yd. selected rdwy. borrh., incl. haul	.70	.60	.84
850 cu. yd. one course sc. gravel surf.	3.25	3.25	2.25
5,540 sq. yd. preparation of untreated rdwy.	.08	.08	.07
70 cu. yd. furn. and placing new fine min. agg.	4.00	4.00	4.24
8 tons bitum. cem. MC-2 prime coat	40.00	40.00	56.00
800 tons bitum. cem. mixture "plantmix"	8.50	8.50	11.90
11 only std. conc. catch basin	90.00	50.00	84.00
12 cu. yd. hand placed riprap	8.00	7.50	11.00
25 M. gals. water	5.00	4.00	2.50
4 only reflector units	10.00	10.00	12.00
		20.00	11.00
			13.00

(Continued on next page)

IT'S A STUBBORN BRUTE ... AND THAT'S GOOD!



You can give this Blue Brute 315' Compressor the toughest jobs on your books and it won't cry for help until you've got your money out of it many times over.

Take, for example, the three-point suspension of engine and compressor in a single housing — it's a Worthington feature that maintains alignment regardless of shock and vibration. Take the Worthington Feather* Valve — it will stay tight-seating and quiet for a lifetime. Take the full force feed lubrication of engine and compressor — it keeps all

*Reg. U. S. Pat. Off.

moving parts in constantly healthy condition. Investigate those vital features!

Teamed up with those versatile Worthington Wagon Drills (that make holes in any direction and at any angle) or other Blue Brute Air Tools, your Blue Brute Compressor will supply *more air* per gallon of fuel — and will stay trouble-free no matter how tough the going.

Make a date with your near-by Worthington distributor so that he can give you the rest of the facts that prove *there's more worth in Worthington*.

H6-4

Get more WORTH from air with WORTHINGTON

Buy BLUE BRUTES



Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have

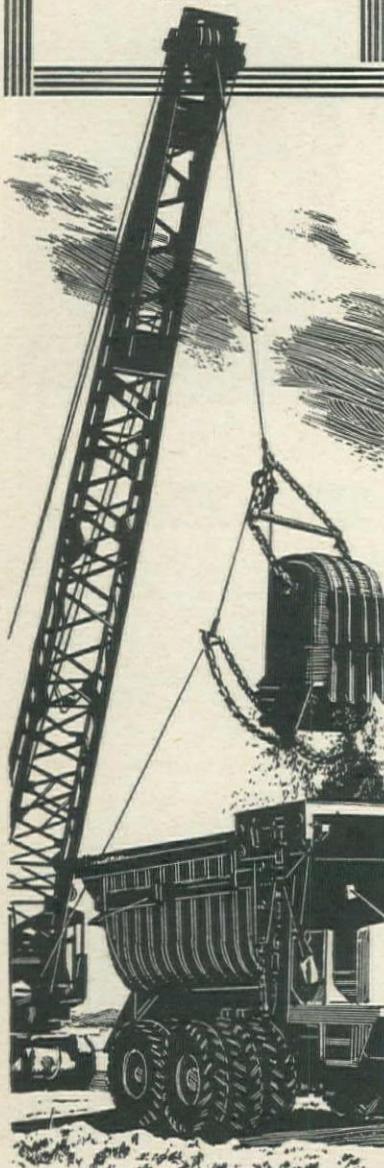
always set the pace for easy operation — available in a wide range of weights and sizes.

WORTHINGTON



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

**EVERY
Petroleum
Product
FOR EVERY
CONSTRUCTION
JOB**



**SEASIDE
OIL COMPANY**



1,573 lin. ft. std. beam guard rail, Type No. 1 or 2, Des. No. 6 in place.....	1.55	1.65	1.90	1.80	2.25	2.00
2,410 sq. yd. removing exist. conc. pavt.....	.60	.50	.56	.50	.20	.50
6 sq. yd. removing exist. conc. sidewalk.....	.60	.50	2.00	1.00	.20	.50
1,270 lin. ft. removing exist. log wheel guard.....	.05	.10	.28	.20	.10	.10
102 lin. ft. bit coated corr. metal pipe 16 ga. 8-in. diam.....	1.00	2.25	1.95	1.50	1.70	1.50
522 lin. ft. pl. conc. or V.C. culv. pipe 12-in. diam.....	1.30	1.25	1.55	1.50	1.50	1.35
153 lin. ft. std. reinf. conc. culv. pipe 18-in. diam.....	2.50	2.50	3.30	2.25	3.50	3.00
25 cu. yd. structure excav.....	5.00	2.50	2.80	10.00	3.50	10.00
690 cu. yd. conc. Class A in place.....	42.00	37.00	50.00	49.00	54.00	58.00
876 lin. ft. reinf. conc. bridge railing.....	6.00	6.00	6.00	6.25	9.00	6.50
140,000 lbs. steel reinf. bars.....	.055	.06	.063	.065	.07	.09
14 only bridge drains.....	50.00	50.00	84.00	50.00	50.00	50.00
5,500 lin. ft. furn. pre-cast conc. piling at site.....	2.50	2.00	2.80	2.15	4.00	3.00
128 only driving precast conc. piles.....	30.00	40.00	42.00	45.00	50.00	50.00
3 only furn. and driving precast conc. test piles.....	250.00	300.00	600.00	150.00	650.00	350.00
Lump sum, rem. portions of exist. structures (2).....	\$1,000	\$2,500	\$3,360	\$7,500	\$2,100	\$4,500
4,200 lbs. struc. steel in place.....	.22	.25	.40	.30	.20	.35

Oregon—Lincoln County—State—Steel Truss

Tom Lillebo, Reedsport, with a bid of \$180,141, was low to the Oregon Highway Department, Salem, on two bridges, both of steel truss construction, over the Siletz River, known as the Fuller Bridge and the Ojalla Bridge, and concrete viaduct approaches and surfaced approaches. The unit bids follow:

(1) Tom Lillebo	\$180,141	(3) C. J. Eldon	\$192,462
(2) Kern & Kibbe	188,938	(4) Marine Contractors, Inc.	243,413

(1) (2) (3) (4)

ROADWAY

Lump sum, clearing and grubbing.....	\$2,000	\$2,000	\$1,000	\$1,000
10 cu. yd. trench excavation unclassified.....	3.50	2.00	3.00	3.00
9,500 cu. yd. general excavation unclass.....	1.10	.75	.60	.60
6,000 yd. sta. short overhaul.....	.01	.02	.02	.025
200 yd. sta. long overhaul.....	1.00	1.00	.60	.20
120 lin. ft. 12-inch concrete pipe.....	2.10	1.80	2.50	3.50
600 cu. yd. salvage surfacing materials.....	1.50	1.50	2.00	1.50
1,200 cu. yd. hauling and placing base course surf.....	3.20	1.50	2.25	1.50
400 cu. yd. hauling and placing top course surf.....	3.20	1.50	2.50	1.50
60 M. gal. sprinkling.....	5.40	3.00	3.00	3.00

OJALLA BRIDGE

Lump sum, shoring, cribbing, etc.	900.00	\$4,500	500.00	720.00
180 cu. yd. structural excavation.....	14.00	9.50	5.00	3.00
15 cu. yd. struc. excav. below elevation shown.....	16.00	15.00	10.00	10.00
365 cu. yd. Class A concrete.....	66.00	39.00	50.00	42.00
68,400 lb. metal reinforcing.....	.10	.07	.075	.06
350,000 lb. structural steel.....	.14	.125	.1227	.13
610 lin. ft. handrail.....	10.00	9.00	8.00	8.50
Lump sum, provision for traffic, etc.	\$15,000	\$9,640	\$9,640	\$7,400

FULLER BRIDGE

Lump sum, shoring, cribbing, etc.	700.00	\$5,000	\$1,000	900.00
250 cu. yd. structural excavation.....	14.00	9.50	5.00	3.00
20 cu. yd. struc. excav. below elevation shown.....	16.00	15.00	10.00	10.00
520 cu. yd. Class A concrete.....	66.00	39.00	50.00	42.00
95,000 lb. metal reinforcing.....	.10	.07	.075	.06
350,000 lb. structural steel.....	.14	.125	.1227	.125
724 lin. ft. handrail.....	10.00	9.00	8.00	8.00
Lump sum, provision for traffic, etc.	\$15,000	\$10,290	\$10,000	\$7,600

Highway and Street...

Wyoming—Fremont Co.—State—Surf.

Knisely-Moore, of Douglas, was low bidder at \$144,778, to the Wyoming Highway Department, and was awarded the contract for grading, drainage, and miscellaneous work on 14.3 mi. of the Lander-Farson road. The bid was only 65 per cent of the engineer's estimate. Work is to start with the melting of the snow. Unit bids were as follow:

(A) Knisely-Moore	\$144,778	(G) Big Horn Construction Co.	\$183,781
(B) Taggart Construction Co.	159,045	(H) Northwestern Engineering Co.	193,677
(C) J. D. Dooling	166,065	(I) Lowdermilk Bros.	203,596
(D) Sharrock & Pursel	166,925	(J) Woodward Construction Co.	212,289
(E) J. H. & N. M. Monaghan.....	171,770	(K) Inland Construction Co.	228,451
(F) Brown Construction Co.	173,309	(L) Engineer's Estimate	210,706

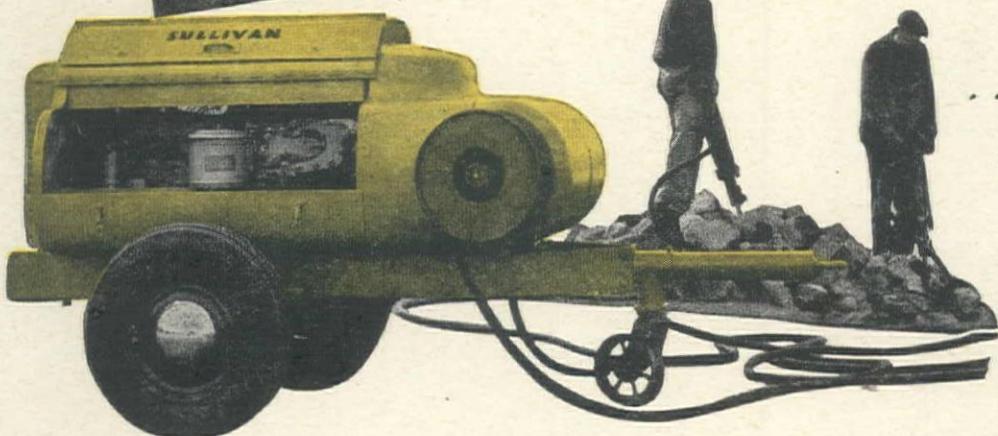
(1) 578,500 cu. yd. excavation.....	(15) 296 lin. ft. 42-in. C.M.P.
(2) 165,000 cu. yd. sta. overhaul.....	(16) 402 lin. ft. 48-in. C.M.P.
(3) 65,000 cu. yd. mi. cubic yard mile haul.....	(17) 158 lin. ft. 66-in. C.M.P.
(4) 3,400 hr. sheep's foot roller operation.....	(18) 400 lin. ft. 6-in. perforated C.M.P.
(5) 500 hr. pneumatic tired roller operation.....	(19) 5,500 lin. ft. standard right-of-way fence.
(6) 4,100 M. gal. watering (emb.).....	(20) 10 ea. end panels.
(7) 220 cu. yd. excavation for pipe culverts.....	(21) 15 ea. brace panels.
(8) 210 cu. yd. structure excavation.....	(22) 50 cu. yd. excavation for drains.
(9) 450 cu. yd. Class 1 riprap.....	(23) 50 cu. yd. stone for drains.
(10) 100 cu. yd. grouted riprap.....	(24) 1,900 lin. ft. portable snow fence.
(11) 1,500 lin. ft. 18-in. C.M.P.	(25) 610 hr. mechanical tamping.
(12) 170 lin. ft. 24-in. C.M.P.	(26) 133 ea. right-of-way markers.
(13) 362 lin. ft. 30-in. C.M.P.	(27) 2 ea. R.C. project markers.
(14) 672 lin. ft. 36-in. C.M.P.	

(A) .15	.16	.18	.18	.14	.19	.225	.21	.23	.28	.25
(2) .015	.015	.015	.015	.015	.015	.015	.015	.015	.015	.015
(3) .15	.15	.20	.15	.45	.15	.14	.25	.26	.15	.15
(4) 3.10	3.25	2.50	3.00	2.50	3.00	3.25	3.00	3.00	2.50	3.50
(5) 4.00	4.00	5.00	5.00	5.50	5.00	3.95	6.50	5.95	4.25	4.00
(6) 1.25	2.50	2.50	3.00	2.50	2.00	1.75	2.50	2.25	2.00	2.00
(7) 1.00	.70	.50	1.00	3.00	2.00	2.00	3.00	2.00	1.75	1.25
(8) 1.50	2.50	1.00	1.00	3.00	2.00	2.50	3.00	2.00	2.00	3.00
(9) 5.00	10.00	4.00	4.00	8.50	10.00	7.00	3.75	9.00	8.00	8.50
(10) 11.00	15.00	5.00	6.00	18.00	15.00	12.00	11.50	18.00	20.00	8.00
(11) 2.00	1.90	1.85	1.80	2.10	3.00	4.00	2.30	2.80	2.55	2.40
(12) 3.00	2.80	2.90	2.70	3.30	4.00	5.00	3.45	4.50	4.00	3.65
(13) 4.00	3.50	3.40	3.20	3.75	6.00	6.00	4.15	5.00	5.10	5.00
(14) 5.75	5.50	5.40	5.50	5.30	9.00	8.00	6.25	6.75	8.30	7.10
(15) 7.00	6.40	6.50	6.25	6.70	10.00	10.00	7.35	7.75	9.00	8.35

(Continued on next page)

Here's the FIRST-NEW-POSTWAR

PORTABLE AIR COMPRESSOR



... a Sullivan
of course!

BIG!

in available power
in air delivered
in bearing areas
in air storage capacity
in fuel storage capacity
in cooling capacity
in dependability

SMALL!

in length
in width
in height
in weight

RUGGED, COMPACT
REALLY PORTABLE!

Sullivan presents this modern, streamlined, sturdy and most efficient line of portable air compressors, the NEW WK-80 SERIES. It's the first portable air compressor to incorporate the NEW materials and efficiency-producing mechanical improvements developed during the war. You have never seen so much air-power, efficiency, portability, low maintenance and reliability packed so efficiently in so little space. With Sullivan patented, direct-concentric valves, two-stage compression, streamlined air passages and the "ECONO-MISER" load control that regulates air supply to demand, the WK-80 sets new high standards of compressor efficiency. Its sturdy "Bulkhead" body construction, full force-feed lubrication, "Cascade" oil cooling and low piston speeds . . . assure lowest maintenance. Add to all these features its minimum overall dimensions and you have a portable compressor that's as modern as

this minute — one that will give you real pride of ownership. The new Sullivan WK-80 is offered in many different sizes, types and mountings. Get all the facts from your nearest Sullivan distributor or branch office. Ask for bulletin A-55, Sullivan Machinery Company, Michigan City, Indiana and Dundas, Ontario.

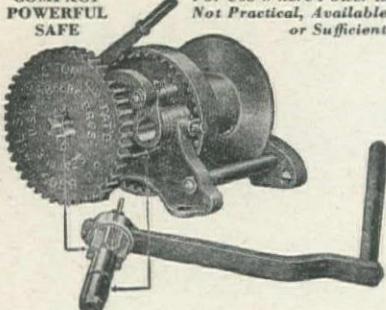
SULLIVAN

THE WORLD'S MOST MODERN PORTABLE COMPRESSED AIR PLANT

ALL STEEL HAND HOIST
Seattle, U.S.A.

COMPACT
POWERFUL
SAFE

For Use Where Power is
Not Practical, Available
or Sufficient



"The strongest geared power for its weight in the world"

Three sizes: 2-, 5- and 15-ton. Capacity comparison figuring $\frac{1}{2}$ " flexible plow steel cable.

2-ton "Lightweight" 75 ft.
5-ton "General Utility" 250 ft.
15-ton Triple-Geared "Special" 1200 ft.

With patented instant gear change and positive internal brake that never fails, and will lock and hold load until released.

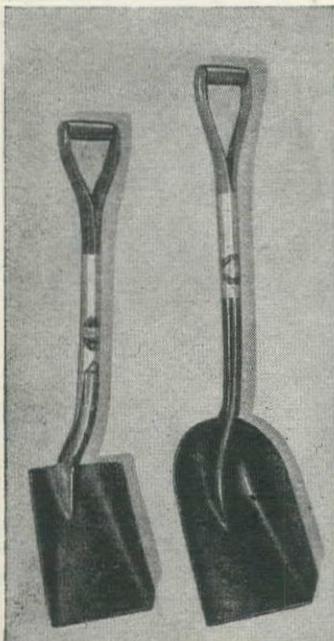
Ratios	Weight	Price
2-ton 4 & 22 to 1	60 lb.	\$ 50
5-ton 4 & 24 to 1	110 lb.	\$ 75
15-ton 4, 19 & 109 to 1	580 lb.	\$250

ALL MODELS priced f.o.b. Seattle. 5-ton size can also be furnished with special 18" or 24" wide drum in place of standard drum 8" wide. Scatter them around the job to suit, one or 100, distributing the load "evenly." Place assembled pipelines, caissons, trusses, girders, or what have you. Just be sure of your rigging and anchorage. Manpower never grew that could break a Beebe Hoist on a fair pull—a 5-ton General Utility withstood a mechanical pull of 41,000 lbs. on official test, breaking a $\frac{3}{8}$ " plow steel cable with Hoist remaining intact.

Complete literature and list of dealers principal U. S. cities and foreign gladly mailed.

BEEBE BROS.

2726 Sixth Ave., So. SEATTLE 4, WASH.



BLADE EDGES
GUARANTEED SPLIT-PROOF

INGERSOLL SHOVELS
"The Borg-Warner Line"

SMITH BOOTH USHER COMPANY, Distributor
Los Angeles, Calif.
Phoenix, Ariz.
Factory Representative:
John F. Kegley & Son, Los Angeles, Calif.

(16)	9.00	8.00	8.00	8.00	9.75	12.00	12.00	9.10	8.50	10.65	10.50	9.00
(17)	15.00	13.00	13.00	15.00	18.75	15.00	18.00	15.25	16.00	20.55	18.50	16.00
(18)	1.25	1.00	1.00	1.10	1.10	2.50	1.00	1.38	3.00	1.50	1.15	1.50
(19)	.11	.12	.08	.10	.14	.10	.16	.15	.18	.12	.11	.14
(20)	7.00	10.00	5.00	15.00	15.00	10.00	12.00	14.00	12.50	12.00	11.00	9.00
(21)	6.00	6.00	3.00	6.00	10.00	10.00	12.00	10.00	10.00	10.00	7.00	7.00
(22)	1.00	2.00	2.00	5.00	5.00	2.00	3.00	5.00	3.00	6.00	2.80	1.50
(23)	2.50	3.50	3.00	6.00	5.00	3.00	6.00	2.50	5.00	10.00	2.80	2.50
(24)	1.00	1.20	1.50	1.00	1.00	.50	1.50	2.00	2.50	1.25	1.10	1.25
(25)	3.50	5.50	2.50	3.00	4.00	5.00	4.50	2.80	5.00	3.50	4.00	3.00
(26)	7.00	6.00	6.00	7.00	5.00	10.00	10.00	7.00	6.00	10.00	8.00	8.00
(27)	20.00	15.00	20.00	20.00	25.00	50.00	25.00	20.00	25.00	20.00	20.00	20.00

Arizona—Gila County—Bureau of Public Roads—Grade and Surface

Evans & Sprawls, Winslow, Arizona, submitted the low bid of \$86,256 to the Bureau of Public Roads, Phoenix, for the construction of 2.8 mi. of SR 9, Bridgeport-Roosevelt Dam, National Forest Highway. The work includes grading and bituminous surfacing. Work quantities and the unit bids submitted are as follow:

(1) Evans & Sprawls	\$ 86,256	(4) Tanner Const. Co.	\$120,729
(2) Mesa Concrete Products Co.	98,894	(5) H. J. Hagen	131,045
(3) A. A. Larsen	105,528		

	(1)	(2)	(3)	(4)	(5)
Lump sum, extra and misc. force account work	100.00	100.00	100.00	100.00	100.00
20 acre clearing and grubbing	130.00	100.00	300.00	400.00	300.00
63,500 cu. yd. unclassified excavation	.50	.68	.70	.70	.90
700 cu. yd. unclassified excav. for struc.	2.00	3.00	3.00	3.00	3.00
18,800 cu. yd. unclassified excav. for borrow, Case 1 (selected sub-grade material)	.60	.65	.55	.90	.90
800 cu. yd. unclassified excav. for borrow, Case 1 (except selected sub-grade material)	.60	1.50	.55	.80	.90
12,000 sta. yd. overhaul	.035	.02	.02	.02	.03
11,000 cu. yd. mi. borrow haul	.20	.30	.25	.20	.30
3,100 lin. ft. furrow ditches	.15	.20	.15	.10	.15
Lump sum, obliteration of old roadways	150.00	150.00	150.00	150.00	150.00
900 M. gal. watering embankment, Item 29	1.75	2.00	2.00	1.00	2.00
330 M. gal. watering subgrade, Item 41	1.75	1.50	2.00	2.00	2.00
240 M. gal. watering of base course, Item 52-A	1.75	1.50	2.00	2.00	2.00
Lump sum, providing and maintaining water plant or plants	300.00	100.00	200.00	200.00	100.00
10,850 ton crushed gravel or crushed stone base course	1.25	1.10	1.50	2.10	2.06
310 ton Type 4 blotter material	6.00	6.00	4.00	6.00	3.00
125 ton liquid asph. matl. (Grade SC-2) for bitum. pres. treat	31.50	32.00	32.00	33.00	40.00
54 ton liquid asph. matl. (Grade SC-4) for bitum. pres. treat	32.50	32.00	32.00	37.00	41.00
53 cu. yd. cement rubble masonry	35.00	17.50	25.00	35.00	25.00
914 lin. ft. 18-in. C.G.S.M. culvert pipe	3.00	3.00	3.00	2.80	2.50
318 lin. ft. 24-in. C.G.S.M. culvert pipe	4.00	4.00	4.00	3.90	3.50
46 lin. ft. 30-in. C.G.S.M. culvert pipe	4.75	4.60	5.00	4.60	5.00
360 lin. ft. 36-in. C.G.S.M. culvert pipe	6.75	6.50	8.00	7.00	7.00
50 lin. ft. 42-in. C.G.S.M. culvert pipe	7.50	8.00	9.00	8.30	9.00
262 lin. ft. 21 $\frac{1}{2}$ -in. by 13 $\frac{1}{2}$ -in. C.G.S.M. culvert pipe (arch type)	3.50	3.25	3.50	3.70	3.00
254 lin. ft. remove, clean and stockpile salvaged culvert pipe	2.00	2.00	2.00	3.00	1.00
4 ea. drop inlets (special size)	30.00	150.00	50.00	150.00	60.00
10 ea. right-of-way monuments, Type A	6.00	7.00	8.00	7.50	6.00
2 ea. concrete maintenance marker posts	6.00	30.00	15.00	10.00	15.00
28 ea. timber culvert markers	4.50	6.00	4.00	3.00	3.00
5,500 lin. ft. barbed wire fence	.12	.20	.20	.20	.12
4 ea. gates (Type 1)	20.00	50.00	50.00	35.00	40.00

California—Santa Clara County—State—Paving

N. M. Ball Sons, Berkeley, submitted the low bid of \$1,178,869 to the Division of Highways, Sacramento, for the grading and paving of 8.1 mi. of SR2 between San Jose and Ford Road. Summary of the unit bids submitted are as follows:

(A) N. M. Ball Sons	\$1,178,869	(H) Macco Construction Co.	\$1,349,487
(B) Fredrickson & Watson Const. Co.	1,186,864	(I) Peter Kiewit Sons & Hubert H. Eyerst, Sr.	1,359,987
(C) Union Paving Co.	1,191,844	(J) A. G. Raisch Co., A. J. Raisch Paving Co. & Harms Bros.	1,391,748
(D) The Utah Construction Co.	1,258,926	(K) E. W. Elliott Const. Co.	1,392,290
(E) Guy F. Atkinson Company	1,292,054	(L) Morrison-Knudsen Company, Inc.	1,529,399
(F) Earl W. Heple	1,292,896		
(G) Chas. L. Harney	1,331,015		
(1) 150 cu. yd. removing concrete	(28) 180 cu. yd. Cl. "A" P.C.C. (structures)		
(2) 75 acres clearing and grubbing (orchard)	(29) 35,000 ea., tie bolt assemblies		
(3) 50 each, removing trees, size 1	(30) 100 ea., monuments		
(4) 80 each, removing trees, size 2	(31) 50 ea., center line monuments		
(5) 10 each, removing trees, size 3	(32) 130 lin. ft. laminated guard railing		
(6) 6 each, removing trees, size 4	(33) 1,540 lin. ft. metal plate guard railing		
(7) 660,000 cu. yd. roadway excavation	(34) 165 ea., culv. markers, proj. markers and guide posts		
(8) 60 cu. yd. ditch and channel excavation	(35) 16.5 miles new property fence		
(9) 9,000 cu. yd. structure excavation	(36) 12 ea., drive gates		
(10) 600,000 sq. yd. compacting original ground	(37) 1,700 lin. ft. 10-in. R.C.P.		
(11) 43,000,000 sta. yd. overhaul	(38) 4,200 lin. ft. 12-in. R.C.P.		
(12) 22,500 tons imported borrow	(39) 1,550 lin. ft. 18-in. R.C.P.		
(13) 221,000 sq. yd. preparing Cl. "C" subgrade	(40) 3,700 lin. ft. 24-in. R.C.P.		
(14) Develop'g water supply and furn. wtg. eqpt.	(41) 450 lin. ft. 30-in. R.C.P.		
(15) 21,500 M. gal. applying water	(42) 500 lin. ft. 8-in. C.M.P. downdrains (16 ga.)		
(16) 429 sta. finishing roadway	(43) 15 ea., spillway assemblies		
(17) 8,500 tons crusher run base	(44) 32 lin. ft. salvaging exist. pipe culverts		
(18) 650 tons sand (penetration treatment)	(45) 27 lin. ft. relaying salvaged C.M.P. culverts		
(19) 3,400 tons screenings (armor coat)	(46) 10 ea., removing and resetting irriga. valves		
(20) 4,400 tons mineral aggregate (P.M.S.)	(47) 12 ea., redwood covers for drop inlets		
(21) 165 tons liquid asphalt, SC-6 (armor coat)	(48) 3 ea., frames and gratings, Type 1		
(22) 215 tons liquid asphalt, SC-1 (prime coat)	(49) 57 ea., frames and gratings, Type 2		
(23) 82 tons liquid asphalt, SC-2 (pen. tr.)	(50) 300 lb. miscellaneous steel		
(24) 242 tons paving asphalt (P.M.S.)	(51) 21,500 lb. bar reinforcing steel		
(25) 32 tons asphaltic emulsion (pt. bdr. & sl. ct.)	(52) 100 ea., red reflectors		
(26) 50,750 cu. yd. Portland cem. conc. (pavt.)	(53) 375 lin. ft. raised bars		
(27) 830 cu. yd. Portland cem. conc. (curbs, gutters and sdwks.)			

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
(1)	1.32	5.00	3.00	5.00	2.50	5.00	4.25	10.00	2.00	3.00	2.50
(2)	360.00	80.00	316.00	400.00	300.00	300.00	285.00	100.00	100.00	200.00	150.00
(3)	6.00	17.00	4.50	20.00	9.00	5.00	9.90	10.00	9.00	10.00	35.00
(4)	18.00	23.00	14.00	30.00	18.00	15.00	26.00	20.00	15.00	20.00	37.50
(5)	42.00	57.00	40.00	50.00	30.00	50.00	33.00	75.00	30.00	25.00	60.00
(6)	60.00	57.00	80.00	150.00	43.00	75.00	52.50	200.00	39.00	50.00	100.00
(7)	.55	.43	.36	.46	.40	.40	.48	.55	.55	.56	.63
(8)	.90	2.30	1.30	1.00	5.00	3.00	2.40	1.75	1.50	1.50	2.00
(9)	1.63	1.72	1.75	3.00	1.60	1.50	2.15	2.85	1.50	1.50	2.25
(10)	.024	.025	.026	.05	.05	.02	.042	.035	.03	.03	.035

(11)	.002	.0034	.003	.003	.002	.004	.0028	.002	.004	.0035	.004	.0034
(12)	.78	1.20	1.10	.75	1.00	1.00	1.40	1.50	1.00	1.47	.65	1.10
(13)	.12	.10	.11	.10	.11	.09	.10	.08	.06	.10	.08	.12
(14)	\$1,200	\$2,800	\$2,500	\$6,000	\$4,000	\$5,000	\$4,500	\$10,000	\$6,000	\$20,000	\$3,500	\$1,350
(15)	1.44	1.40	2.00	1.50	1.80	2.00	1.70	2.30	1.80	1.00	1.50	2.00
(16)	6.00	11.00	10.00	9.00	18.00	10.00	22.50	25.00	11.00	20.00	18.00	16.00
(17)	2.16	2.15	2.40	2.50	3.80	2.50	2.45	2.30	2.00	2.70	1.85	2.40
(18)	2.76	3.50	3.75	2.75	3.70	5.00	4.10	3.45	3.75	3.55	4.50	3.80
(19)	2.58	3.50	4.50	4.50	5.00	4.00	5.20	4.00	3.50	4.50	5.00	4.50
(20)	4.20	4.60	3.70	5.00	4.70	5.00	5.30	4.50	4.35	4.15	4.75	6.50
(21)	16.00	20.40	20.00	20.00	17.00	25.00	21.00	19.00	21.00	22.60	22.00	30.00
(22)	16.00	20.40	19.00	16.50	16.00	25.00	21.00	14.00	21.00	17.10	20.00	19.00
(23)	17.00	20.90	20.00	20.00	17.00	25.00	21.00	16.00	21.00	19.50	22.00	22.00
(24)	15.00	15.00	15.00	20.00	13.00	20.00	19.00	15.00	17.00	15.80	17.50	17.40
(25)	21.00	22.50	25.00	25.00	21.00	25.00	23.00	28.00	25.00	22.00	25.00	53.00
(26)	8.20	9.00	10.00	9.00	11.00	10.00	9.90	10.35	9.65	9.80	9.00	11.80
(27)	25.00	27.60	25.00	30.00	35.00	25.00	32.50	37.00	22.00	50.00	28.00	42.00
(28)	63.00	40.00	25.00	40.00	59.00	50.00	48.00	60.00	45.00	50.00	40.00	50.00
(29)	.67	.53	.65	.70	.65	.60	.75	.55	.50	.60	.60	.65
(30)	6.00	4.00	3.75	5.00	3.50	4.00	4.00	5.00	4.00	5.00	3.75	5.50
(31)	20.00	15.00	18.00	10.00	27.00	20.00	13.00	23.00	25.00	35.00	9.00	6.40
(32)	2.00	2.30	1.50	2.00	2.50	3.50	2.10	2.30	2.20	2.00	2.25	2.20
(33)	2.25	1.85	2.00	2.30	3.00	6.50	2.40	2.30	4.50	2.00	3.20	
(34)	5.00	3.22	4.00	4.00	3.40	4.00	2.60	4.25	3.50	3.00	4.00	5.20
(35)	\$1,100	950.00	10.00	\$1,100	\$1,230	\$1,000	\$1,100	\$1,150	\$2,000	\$1,250	\$1,500	\$1,800
(36)	30.00	28.00	30.00	30.00	30.00	50.00	75.00	40.00	40.00	25.00	35.00	40.00
(37)	1.70	2.20	2.20	1.75	3.00	4.85	2.30	1.60	2.00	2.25	3.00	1.50
(38)	1.50	1.70	1.80	2.00	2.00	2.63	2.45	1.75	3.00	2.50	3.20	1.75
(39)	2.50	2.30	2.50	2.75	3.00	2.50	2.50	2.65	5.00	3.00	5.00	2.70
(40)	3.70	3.60	3.60	3.75	4.00	3.50	3.75	4.10	6.00	5.00	6.40	4.30
(41)	5.30	4.85	5.00	5.00	5.00	4.75	5.50	5.75	8.00	6.50	7.00	5.80
(42)	1.20	1.20	1.30	1.25	1.20	1.50	1.35	1.45	1.25	1.25	1.30	1.55
(43)	24.00	20.00	20.00	35.00	25.00	25.00	22.50	22.00	21.00	20.00	25.00	35.00
(44)	.90	2.30	1.00	2.00	2.00	2.00	1.10	1.00	.50	1.00	2.00	1.35
(45)	.90	2.30	1.00	2.00	2.00	2.00	1.20	1.50	.50	1.00	2.00	1.35
(46)	24.00	11.50	20.00	50.00	25.00	20.00	24.00	200.00	10.00	50.00	15.00	54.00
(47)	24.00	7.00	15.00	10.00	7.00	15.00	9.00	10.00	5.00	10.00	10.00	13.50
(48)	90.00	57.00	75.00	75.00	90.00	70.00	62.00	55.00	90.00	75.00	100.00	80.00
(49)	70.00	56.00	75.00	75.00	67.00	60.00	56.00	55.00	65.00	75.00	60.00	80.00
(50)	.50	.50	.25	.20	.50	.50	.40	.25	.20	.25	.30	.55
(51)	.05	.05	.10	.08	.05	.06	.06	.05	.07	.06	.08	.06
(52)	1.50	2.20	2.50	3.50	1.10	4.00	3.00	2.25	1.00	2.50	2.00	2.70
(53)	1.00	1.15	1.00	1.50	1.00	1.00	1.15	1.00	.80	1.00	1.25	1.40

Montana—Yellowstone County—State—Grade and Surface

Stanley H. Arkwright, Inc., Billings, submitted low bid of \$396,582 and was awarded the contract by the State Highway Commission, Helena, for the construction of 12.1 mi. of Billings-Huntley Bridge section on the Billings-Pompey's Pillar highway. Following is a summary of the work quantities and the unit bids received:

(A) Stanley H. Arkwright, Inc. \$396,582
 (B) S. Birch & Sons Construction Co. 402,214
 (C) Big Horn Construction Co. 415,161
 (D) Union Construction Co. 428,345
 (E) McLaughlin, Inc. 439,990

(F) O'Neil Construction Co. \$454,867
 (G) Max J. Kuney Co. 459,126
 (H) Northwestern Engineering Co. 478,470
 (I) Inland Construction Co. 500,848

(1) 349,056 cu. yd. unclass. excav. and borrow.
 (2) 4,180 cu. yd. culvert excavation.
 (3) 917,932 cu. yd. overhaul.
 (4) 56,433 mi. yd. overhaul.
 (5) 92,758 cu. yd. selected material.
 (6) 110,084 ton base course cr. gravel surf.
 (7) 42,501 ton Grade A top base crs. cr. grav. surf.
 (8) 2,613 ton stone chips.
 (9) 5,400 cu. yd. binder.
 (10) 10,800 mi. yd. overhaul on binder.
 (11) 9,400 M. gal. watering.
 (12) 900 units rolling.
 (13) 234,824 gal. appl. of SC-4 asph. road oil.
 (14) 12,593 gal. prime coat oiling (SC-1 oil).
 (15) 71,942 gal. seal coat oiling (150-200 A cem.).
 (16) 11,725 mile processing.
 (17) 2,300 sq. yd. processing.
 (18) 2,362 lin. ft. 15-in. reinf. conc. pipe culv.
 (19) 714 lin. ft. 18-in. reinf. conc. pipe culv.
 (20) 2,248 lin. ft. 24-in. reinf. conc. pipe culv.
 (21) 32 lin. ft. 30-in. reinf. conc. pipe culv.
 (22) 32 lin. ft. 48-in. reinf. conc. pipe culv.

(23) 122 lin. ft. 24-in. reinf. conc. pipe culv. ex. str.
 (24) 68 lin. ft. 18-ft. perf. corr. metal pipe.
 (25) 868 lin. ft. 12-in. corr. metal syphon pipe.
 (26) 3,460 lin. ft. 18-in. corr. metal syphon pipe.
 (27) 1,588 lin. ft. 24-in. corr. metal syphon pipe.
 (28) 360 lin. ft. 30-in. corr. metal syphon pipe.
 (29) 328 lin. ft. 36-in. corr. metal syphon pipe.
 (30) 250 lin. ft. 48-in. corr. metal syphon pipe.
 (31) 6 lin. ft. relay pipe culverts.
 (32) 101.54 cu. yd. Class A concrete.
 (33) 13.50 cu. yd. Class B concrete.
 (34) 12,010 lbs. reinf. steel.
 (35) 3,240 M.F.B.M. lumber in headgates.
 (36) 5 ea., metal headgates, 18-in. dia.
 (37) 1,645 sq. yd. ground riprap.
 (38) 65 ea., concrete station marker.
 (39) 128 ea., concrete r/w monument.
 (40) 1 ea., concrete project marker.
 (41) 4 ea., refl. adv. warning sign.
 (42) 4 ea., refl. R.R. crossing sign.
 (43) Lump sum, rem. and relay. hdgt. and pipe.
 (44) 1,850 ton stockpiled gravel.

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	
(1)	.2222	.28	.265	.30	.30	.24	.30	.28	.278
(2)	2.00	1.00	1.50	1.00	1.50	1.50	1.50	1.25	.60
(3)	.0072	.01	.01	.02	.01	.01	.01	.015	.02
(4)	.13	.20	.15	.15	.12	.20	.10	.15	.20
(5)	.4949	.50	.55	.50	.61	.55	.65	.54	.74
(6)	.77	.65	.75	.74	.75	.75	.75	.12	.86
(7)	.88	.75	.90	1.00	.90	1.00	.90	.131	.137
(8)	5.55	5.00	3.75	4.00	5.00	5.00	3.00	4.00	5.80
(9)	.01	.01	.05	.05	.15	.20	.10	.35	.10
(10)	.01	.01	.05	.10	.15	.10	.10	.10	.10
(11)	1.55	2.50	1.60	1.30	1.50	2.00	1.50	1.75	.80
(12)	4.44	5.00	6.25	6.00	6.00	8.00	6.00	5.00	7.25
(13)	.0555	.085	.055	.07	.07	.10	.12	.07	.076
(14)	.0555	.09	.08	.07	.10	.10	.12	.09	.117
(15)	.0666	.10	.085	.08	.10	.15	.12	.09	.137
(16)	888.88	400.00	\$1,000	700.00	900.00	800.00	\$1,000	650.00	840.00
(17)	.33	.10	.33	.20	.40	3.00	.15	.25	.70
(18)	1.55	2.00	2.25	2.00	2.00	2.00	3.50	2.10	2.80
(19)	2.22	2.65	2.75	2.50	2.50	2.50	3.80	2.50	3.40
(20)	4.44	4.00	4.00	3.50	4.00	4.50	5.60	3.60	4.70
(21)	5.55	5.50	5.75	5.00	7.00	6.00	8.00	5.00	6.30
(22)	12.12	12.00	14.00	15.00	14.00	18.00	15.00	15.00	13.60
(23)	4.44	4.50	4.50	4.00	4.50	5.00	6.20	4.25	6.40
(24)	2.22	2.00	2.50	3.00	3.00	4.00	3.00	2.50	3.30
(25)	3.33	2.00	2.40	3.00	2.00	3.00	3.00	2.00	3.80
(26)	3.33	3.00	3.50	3.00	3.00	5.00	4.00	2.80	4.20
(27)	4.44	4.00	5.00	4.00	4.50	6.00	5.70	4.00	5.80
(28)	5.55	4.75	6.00	5.00	6.00	7.00	7.00	5.00	7.40
(29)	7.77	7.00	8.50	7.00	9.00	8.00	10.00	7.25	10.60
(30)	9.99	9.50	11.50	12.00	15.00	10.00	14.00	15.00	15.70
(31)	3.33	2.50	2.50	2.00	2.00	10.00	1.50	1.50	3.00
(32)	44.44	42.00	35.00	40.00	37.50	40.00	40.00	40.00	36.50

(Continued on next page)



MALL TOOL COMPANY

7735 South Chicago Avenue

Chicago 19, Illinois

Offices in Principal Cities

25 Years of

"Better Tools for Better Work"

RAPID!



JUNIOR MODEL WITH HORIZONTAL FRAME ATTACHMENT

Will break 15-inch reinforced concrete walls up to 10 feet high.

Frame attachment can be removed and boom tipped up to vertical position for breaking all types of pavement.

Rapid Pavement Breaker Co.

1517 Santa Fe Ave.
Los Angeles 21, California

**PIPE
for Every
PURPOSE**

Whether it's a Giant Corrugated Culvert or the simplest of water systems—there's a Beall pipe to fit the job. You'll find that engineers and contractors specify Beall pipe because they have learned to depend on its uniform quality.

Beall industrial pipe ranges from 4" to 84" diameter and it includes pipe for every purpose.

**MUNICIPAL WATER SYSTEMS
DRAINAGE SYSTEMS
ROAD CULVERTS
PUMPING PLANTS
WELL CASINGS
INDUSTRIAL USES
IRRIGATION SYSTEMS**

10% of our gross payroll goes into war stamps and bonds.

**BEALL
PIPE & TANK CORP.**
1945 NORTH COLUMBIA BOULEVARD
PORTLAND, OREGON

Offices in: SEATTLE, SPOKANE, BOISE

(33)	44.44	70.00	50.00	80.00	37.50	40.00	40.00	40.00	46.50
(34) .....	.11	.10	.08	.10	.10	.10	.09	.09	.12
(35)	300.33	250.00	135.00	200.00	200.00	200.00	100.00	160.00	185.60
(36)	66.66	65.00	60.00	150.00	75.00	100.00	70.00	30.00	127.50
(37)	5.55	2.00	3.50	5.00	6.00	6.00	2.00	3.25	5.60
(38)	5.00	5.00	15.00	5.00	5.00	5.00	6.00	5.00	5.00
(39)	3.00	4.00	5.00	3.00	3.00	3.00	4.00	4.00	5.00
(40)	25.00	10.00	15.00	10.00	20.00	15.00	15.00	16.00	20.00
(41)	100.00	50.00	35.00	50.00	25.00	35.00	35.00	35.00	60.00
(42)	100.00	100.00	75.00	100.00	25.00	55.00	100.00	60.00	95.00
(43)	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00	200.00
(44) .....	.88	.75	.85	.80	.90	1.00	.75	1.40	1.22

New Mexico—Santa Fe County—State—Surf.

Skousen Construction Co., Albuquerque, was awarded the contract on a low bid of \$493,895, by the New Mexico Highway Department, for grading, drainage, and surfacing on 7.7 mi. of U. S. Highway 85 between Santa Fe and Casoncito. The work, to be performed in 350 working days includes 4 multiple concrete box culverts each over 20 ft. span, and the road will be finished with bituminous top course surfacing. The unit bids are as follows:

(1) Skousen Construction Co.	\$493,895	(4) Armstrong & Armstrong	\$545,527
(2) Lowdermilk Bros.	496,702	(5) Allison & Haney	559,419
(3) Henry Thygesen & Co.	521,369	(6) Brown Bros.	585,566

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, removal of drain. struct.	\$15,000	\$14,000	\$14,400	\$16,500	\$18,000	\$7,000
Lump sum, removal of obstructions.	500.00	500.00	400.00	600.00	\$5,000	100.00
225,000 cu. yd. excav.—unclassified.	.73	.67	.86	.87	.85	.90
4,010 cu. yd. excav. for structures	2.00	2.50	1.50	1.75	2.00	1.50
500 cu. yd. excav. for pipe culverts.	2.00	1.50	1.50	2.30	2.00	2.00
653,200 sta. yd. overhaul.	.02	.01	.02	.03	.03	.02
50,600 $\frac{1}{4}$ mi. yd. haul	.12	.075	.08	.06	.07	.08
1,290 hr. rolling—sheepsfoot roller	4.00	5.00	5.00	4.50	6.00	4.00
815 hr. rolling—steel tired roller	5.00	5.00	5.00	4.50	6.00	5.00
77 hr. rolling—pneumatic tired roller	4.00	10.00	4.50	5.00	8.00	5.00
3,390 M. gal. watering	1.50	2.25	2.00	2.30	3.00	4.00
3,679 cu. yd. Class "A" concrete.	28.00	32.00	30.00	30.00	30.00	34.00
394,200 lb. reinforcing steel	.063	.072	.065	.07	.08	.08
1 ea. gate and cattle guard—14-ft. roadway	700.00	900.00	500.00	500.00	900.00	300.00
4 ea. gates—Texas Type	10.00	10.00	5.00	10.00	5.00	5.00
347 ea. bracing	2.50	5.00	3.50	3.20	2.00	2.00
100 ea. right of way and station markers	5.00	5.00	5.00	4.00	5.00	4.00
83,400 lin. ft. removing and rebuilding fence	.06	.10	.09	.11	.10	.06
3,200 ea. new posts for rebuilding fence	.75	1.00	.50	1.00	.60	1.00
4,600 lin. ft. contour ditches	.10	.10	.10	.09	.10	.10
995 hr. mechanical tamping	5.00	4.50	5.00	3.50	5.00	3.00
71,470 ton ballast	.55	.65	.58	.66	.60	.82
33,200 ton leveling course	1.00	.75	.70	.86	.90	1.30
700 bbl. cutback asph.—Type MC-1	4.70	4.50	5.00	4.50	4.80	5.00
3,615 bbl. cutback asph.—Type MC-3	4.50	4.25	4.50	4.50	5.00	5.00
11,450 ton top course surf.	1.00	1.00	.80	.82	1.00	1.00
7,697 mile mixing asphalt and aggregate	900.00	900.00	800.00	800.00	750.00	800.00
775 bbl. 200-300 asphalt (for seal coat)	5.00	4.50	5.00	4.80	5.00	5.00
1,375 ton aggregate—seal coat	5.00	4.50	4.50	4.00	5.00	5.00
20 cu. yd. rock and wire check dams	20.00	20.00	7.00	12.00	9.00	10.00
270 ea. warning posts	5.00	6.50	8.00	7.00	6.00	8.00
137 ea. reflectorized warning posts	5.00	7.00	8.00	7.50	6.50	8.00
4 ea. removing and rebuilding cattle guards	150.00	200.00	250.00	300.00	600.00	300.00
196 lin. ft. std. reinf. conc. pipe—24-in. diam.	.....	.....	6.00	.....	.....	.....
508 lin. ft. std. reinf. conc. pipe—36-in. diam.	.....	.....	8.00	.....	.....	.....
196 lin. ft. corr. galv. met. culv. pipe—24-in. diam.	4.00	3.50	5.00	3.20	3.00	3.00
508 lin. ft. corr. galv. met. culv. pipe—36-in. diam.	7.00	5.80	7.00	6.00	4.00	4.00

Arizona—Coconino County—State—Pave

Tanner Construction Co., Phoenix, bid low to the Arizona Highway Commission, at \$824,994, on grading, draining, and paving with Portland cement concrete on an aggregate base approximately 7 mi. of the Flagstaff-Winslow highway, easterly from a point 7 1/2 mi. east of Flagstaff. Unit bids submitted follow.

(1) Tanner Construction Co.	\$824,994	(4) Fisher Contracting Co.	\$885,793
(2) Bowen, McLaughlin & Lynch	849,902	(5) W. E. Orr.	916,929
(3) Western Construction Co.	883,565	(6) Packard Contracting Co.	944,958
	(1)	(2)	(3)
210,714 cu. yd. roadway excav. (unclass.)	1.15	1.10	1.22
10,000 cu. yd. overbreakage	.8625	.825	.915
10,000 cu. yd. slides	.575	.55	.61
1,595 cu. yd. drainage excav. (unclass.)	.90	1.10	1.25
7,100 lin. ft. grader ditches	.10	.05	.12
1,210 cu. yd. structural excav. (unclass.)	2.50	2.20	2.64
367,940 sta. yd. overhaul	.02	.02	.015
4,463 cu. yd. mi. haul	.23	.30	.30
6,950 ton imported borrow	.50	.75	.70
66,724 ton aggregate base	.85	.70	.88
17,000 cu. yd. stripping pits	.20	.30	.22
7,321 M. gal. sprinkling	2.20	3.40	3.30
2,831 hr. rolling	4.50	5.00	5.30
99,505 sq. yd. conc. pavement	3.15	3.40	3.15
1,034 cu. yd. Class "A" conc. (incl. cement)	30.00	35.00	39.00
179 cu. yd. Class "D" conc. (incl. cement)	40.00	50.00	46.00
127,528 lb. reinf. steel (bars)	.08	.08	.08
195,370 lb. structural steel	.12	.12	.14
427 lin. ft. structural steel handrail	6.00	7.50	6.25
1,540 lin. ft. steel pile shells	2.70	3.00	2.80
44 ea. driving pile shells	45.00	70.00	61.00
80 lin. ft. steel test pile shells	3.20	4.00	2.80
2 ea. driving test pile shells	75.00	190.00	148.00
1,620 lin. ft. filling steel pile shells (conc. and reinf. steel)	1.00	1.25	1.24
2 ea. loading tests for piles	150.00	280.00	218.00
224 lin. ft. 18-in. C.M.P. (except excav.)	2.40	2.20	3.70
292 lin. ft. 24-in. C.M.P. (except excav.)	3.40	3.30	5.20
770 lin. ft. 36-in. C.M.P. (except excav.)	6.50	6.50	8.75
5 ea. cattle guards (2 unit)	400.00	420.00	400.00
7,275 lin. ft. road guard	1.70	1.90	2.00
214 ea. guide posts	5.00	5.00	3.75
66 ea. r/w markers (Type "E")	5.00	6.30	5.00
9,407 ton mineral aggregate	.95	.95	1.28
800 ton. road oil (SC-4) (for roadmix)	24.00	25.00	26.00
7,067 mi. processing roadmix	800.00	500.00	\$1,200
1,054 ton screenings	4.50	2.50	5.00
142 ton emuls. asph. (Class "A") (for seal coat)	30.00	30.00	31.45
1,222 sq. yd. placing intersections	.75	.25	.81

CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than \$10,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information: County of job location (capital letters); name and address of contractor (bold face); bid price; brief description of work; awarding agency; and approximate date of award. More detailed information on many of these projects is often available, and will gladly be furnished upon your request to the Editor, WESTERN CONSTRUCTION NEWS, 503 Market Street, San Francisco.

CONTRACTS AWARDED

Large Western Projects . . .

B. C. Bridge and Dredging Co., Ltd., of Vancouver, British Columbia, has a \$5,000,000 contract to build a pulp and paper plant in Port Alberni, B. C., for Bloedel, Stewart and Welch of Vancouver.

Tanner Construction Co., Phoenix, Ariz., will reconstruct and improve 7 mi. of Highway 66 going east from Flagstaff. The Arizona State Highway Commission awarded the firm the \$824,994 contract.

Morrison-Knudsen Co. and **J. F. Shea Co.**, both of Los Angeles, Calif., were awarded a \$1,228,841 contract on a joint bid for constructing earthwork and concrete lining and structures from station 5150 plus 00 to station 5725 plus 00 of the Coachella Canal, a westerly extension of the All-American canal system in Southern California. The Bureau of Reclamation in Yuma, Ariz., announced the award.

Campbell Construction Co., Sacramento, Calif., was awarded a \$1,000,000 contract by Roos Bros., Inc., to remodel the Physicians' Building at 10th and K Sts., Sacramento, to provide 70,000 sq. ft. of floor space for the apparel store, which will lease it.

M & K Corp. of San Francisco, received a contract for \$796,990 from the San Francisco Department of Public Works to construct the Scott St. sewer system on 17th, Church, 14th, Sanchez and Steiner Sts., between Treat Ave. and Waller St. in the bay city.

E. A. Ralston, Los Angeles, Calif., will build 30 hotel bungalows for Greg Bautzner of Las Vegas, Nev., on Highway 91, out of Las Vegas.

Oscar Quisle of Fort Worth, Tex., has a contract worth \$540,542 to construct two dormitories at Texas Christian University in Fort Worth. The university's president, Dr. M. E. Sadler, announced the award.

General Construction Co., Ltd., of Vancouver, British Columbia, has been awarded \$1,294,945 by the B. C. Power Commission to build a power house, storage tank and other facilities at the Campbell River development on Vancouver Island.

Teichert & Son, Inc., Sacramento, Calif., will receive \$795,692 from the state of California to make 8.4 mi. of highway improvements between Santa Rita and .3 mi. north of Crazy Horse Summit in Monterey Co.

Newstrom-Davis & Co. of Denver, Colo., have a contract from Colorado Woman's College to build an activities building and a dormitory costing \$425,000 on the Denver campus.

Cascade Contractors, Inc., Seattle, Wash., are going to construct 420 mi. of transmission line and rural electric distribution system in Douglas Co., Washington. The \$408,034 contract was awarded by Douglas Co. Public Utilities District No. 1 at Waterville.

Baruch Corp., Los Angeles, is starting work on a \$3,081,000 contract to erect Quonset huts and other housing in Griffith Park, Los Angeles, for FPHA.

Erbentraut & Summers, San Francisco, at \$1,123,650, will build a 4-story concrete storehouse at the San Francisco Naval Shipyard, for Bureau of Yards and Docks, Washington, D. C.

Harney, Haas and Rothschild, and **Barrett & Hilp**, all of San Francisco, have received a joint contract for more than a million dollars for three buildings in an area at Oakdale and Industrial Aves., San Francisco, part of a four million dollar Apparel City planned.

AIR
PLUS

JAEGER COMPRESSOR

FREE AIR FLOW THRU BIGGER VALVES . . . so cool they operate indefinitely without carbon . . . "ULTRA LAPPING" makes them leakproof and 10 TIMES LONGER LIVED!



VALVED WITH TOUGH SWEDISH TWINS

The heart of every "AIR PLUS" Compressor is a set of Swedish Twins . . . steel chosen for its toughness and carefully hardened . . . "ultra lapped" by Jaeger's exclusive process to form perfect seating, leakproof valves and make them 10 times longer lived . . . doubled in size to let the air flow freely, eliminating heat, carbon and power-wasting back pressure, and to operate with lower lift and a resulting minimum of wear.

Jaeger's compressor unit is of balanced W-type, full force feed lubricated, designed to operate at 20% to 30% slower piston speeds than others and with 100% efficient intercooling. It delivers cooler air at lowest known cost in fuel, is extremely simple, dependable and long lived.

Ask for Catalog JC-5, describing gasoline, diesel and electric powered models—60 to 500 cubic feet.

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

Highway and Street...

Arizona

COCHISE CO.—Packard Construction Co., 412 Luhrs Tower Bldg., Phoenix—\$384,932 for Lowell traffic circle of Bisbee-Douglas hwy.—State Hwy. Commission, Phoenix. 2-24

COCONINO CO.—Fisher Contracting Co., Box 4035, Phoenix—\$448,211 for reconstruction and improvement of 4 mi. on Hwy. 66 E. of Flagstaff—by State Hwy. Commission, Phoenix. 2-12

COCONINO CO.—Tanner Construction Co., Box 1832, Phoenix—\$824,994 for reconstruction and improvement of 7 mi. on Hwy. 66 E. from Flagstaff—State Hwy. Commission, Phoenix. 2-12

California

COLUSA CO.—Harms Brothers, Route 4, Box 2220, Sacramento—\$219,031 for 3.3 mi. of grade, and surf., and reinf. conc. bridge across Cortina Creek, betw. 3 mi. N. of Arbuckle and 4 mi. S. of Williams—by Division of Hwys., Sacramento. 2-7

EL DORADO CO.—Utah Construction Co., 1 Montgomery St., San Francisco—\$260,925 for 3.4 mi. grad. and surf., betw. Shingle Springs and 1 1/4 mi. W. of El Dorado—by Div. of Hwys., Sacramento. 2-20

LOS ANGELES CO.—Harvey Construction Co., 1147 E. Garvey Ave., El Monte—installation of 123,000 sq. ft. 1 1/2-in. rock and oil paving at housing project, 108th and Western Ave., Los Angeles—by Spiros G. Ponty, Los Angeles. 1-25

LOS ANGELES CO.—David R. Malcolm, 14161 Oxnard Blvd., Van Nuys—\$15,755 for ground and street improvements, Ledge Ave. elementary school, Roscoe district, Los Angeles—by Board of Education, Los Angeles. 1-25

MONTEREY CO.—Teichert & Son, Inc., Box 1113, Sacramento—\$795,692 for hwy. improvements betw. Santa Rita and 3 mi. N. of Crazy Horse Summit, 8.4 mi.—by Div. of Hwys., Sacramento. 1-25

SOLANO CO.—C. M. Syar, Box 1431, Vallejo—\$27,494 for .3 mi. of grade, and paving, Waterfront Rd. betw. Virginia and Santa Clara Sts., Vallejo—by Division of Hwys., Sacramento. 2-5

Colorado

CUSTER CO.—Brown Construction Co., 1322 E. Willamette, Colorado Springs—\$163,804 for 3.72 mi. of secondary hwy. 96 betw. Wetmore and Westcliffe—by State Hwy. Dept., Denver. 2-15

LARIMER CO.—Brown Construction Co., 1322 E. Willamette, Colorado Springs—\$199,359 for 2.5 mi. of new hwy. on U. S. 40, from W. side of Berthoud pass toward Fraser—by State Hwy. Dept., Denver. 2-15

LOGAN CO.—Deakin Construction Co., Denver—\$69,787 for 3.9 mi. of new hwy. on secondary hwy. 63 betw. Atwood and Akron—by State Hwy. Dept., Denver. 2-15

MESA CO.—J. H. and M. M. Monaghan and Associates, 332 S. Race St., Denver—\$369,976 for 10.9 mi. of hwy. on U. S. 5 and 50 betw. Grand Junction and Fruita—by State Hwy. Dept., Denver. 2-15

Kansas

DECATUR CO.—Broce Construction Co., 214 S. 2d., Dodge City—\$16,606 for 19.9 mi. bitu. sealing—by State Hwy. Commission, Topeka. 1-23

GRAHAM CO.—Broce Construction Co., 214 S. 2d., Dodge City—\$11,839 for 15.7 mi. bitu. sealing—by State Hwy. Commission, Topeka. 1-23

LOGAN CO.—San-Ore Construction Co., McPherson—\$113,332 for 37 mi. dense graded surf. course, roadmix method—by State Hwy. Commission, Topeka. 1-23

NORTON CO.—D. G. Hansen, Logan—\$18,855 for 5 mi. stabilization—by State Hwy. Commission, Topeka. 1-23

NORTON CO.—L. F. Harper, Great Bend—\$108,130 for 5 mi. grade., and \$112,402 for 5 mi. grade—by State Hwy. Commission, Topeka. 2-23

OSBORNE CO.—List & Clark Construction Co., 414 Railway

NOW! P&H Hard-Facing Electrodes To Match Desired Rockwell "C" Hardness



P&H now makes hard surfacing a simpler, easier job — easier in the selection of the correct electrode . . . easier to get the desired as-welded hardness.

These four new P&H "Harcote" Electrodes do it! For now Harcote is available in a type having the exact degree of Rockwell C hardness for the job. If the job calls for a Rockwell C hardness of 55 — just order and use Harcote "55". That's all there is to it! No guesswork—no confusion. Simply specify "Harcote" according to the corresponding number of Rockwell "C" hardness desired.

SAVE TIME — SAVE EQUIPMENT
— USE P&H HARCO

Call Your P&H Representative or write for complete information on Harcote. A complete line of other P&H electrodes is also available.

P & H

HARNISCHFEGER
CORPORATION

WELDING ELECTRODES • METALS • KITS • ELECTRIC CABLES • ARC WELDERS • EQUIPMENT

General Offices:
4490 W. National
Avenue,
Milwaukee 14, Wis.



Coordination of men and materials on construction jobs assures that start on schedule and the job finished as guaranteed. Most of the contractor's headaches can be spared by taking advantage of Keystone's One Source Service that provides all paving joints and accessories necessary for modern paving delivered expeditiously from one central source. Eliminate the delay of waiting for shipments from scattered points that never coincide with your plan. See your Keystone distributor today or write direct.

Don't hesitate to take advantage of Keystone free engineering and technical advisory service. Write Box No. 317.

Keystone ASPHALT PRODUCTS CO.

GENERAL OFFICE—43 E. OHIO ST., CHICAGO 11, ILLINOIS
MANUFACTURING PLANT—CHICAGO HEIGHTS, ILLINOIS

WESTERN DISTRIBUTORS

W. J. Burke & Co., Inc.
2261 E. 15th St., Los Angeles, Cal.

Mason's Supply Company
2637 S.E. 12th St., Portland, Ore.

W. J. Burke & Co., Inc.
780 Bryant St., San Francisco, Cal.

W. R. Frank & Company
118 S. 5th West St., Salt Lake City, Utah



PACIFIC WIRE ROPE COMPANY
LOS ANGELES 21, CALIF., U.S.A. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

Exchange Bldg., Kansas City, Mo.—\$77,668 for 1.4 mi. grade.—by State Hwy. Commission, Topeka. 1-23

RAWLINS CO.—San-Ore Construction Co., McPherson—\$11,606 for 7.3 mi. sing. asph. surf. treat.—by State Hwy. Commission, Topeka. 1-23

SHERMAN CO.—San-Ore Construction Co., McPherson—\$12,057 for 16.9 mi., and \$12,616 for 17.2 mi. of bitu. sealing—by State Hwy. Commission, Topeka. 1-23

SMITH CO.—Harry Henery, Ottawa—\$14,444 for 15.6 mi. bitu. sealing—by State Hwy. Commission, Topeka. 1-23

WALLACE CO.—San-Ore Construction Co., McPherson—\$13,052 for 17.9 mi. bitu. sealing—by State Hwy. Commission, Topeka. 1-23

Montana

ROOSEVELT CO.—M. F. Kiely & Sons, Box 65, Butte—\$143,711 for paving, curbing and sewer reconstruction, Wolf Point—by City Council, Wolf Point. 2-13

New Mexico

LINCOLN CO.—Henry Thygesen & Co., Box 876, Albuquerque—\$332,011 for 8.2 mi. of grade, structures, 5 box culverts, 2 timber bridges, watering, rolling, ballast, leveling, surf., on U. S. Hwy. 54 betw. Carrizozo and Tularosa—by State Hwy. Dept., Santa Fe. 2-25

ROOSEVELT CO.—Littlefield Construction Co., Albuquerque—\$224,457 for 8.6 mi. of grade, structures, culvert, watering, rolling, leveling, ballast, surf., on State Hwy. 92, betw. Elida and Dora—by State Hwy. Dept., Santa Fe. 2-25

UNION CO.—W. T. Bookout Construction Co., Box 298, Las Vegas—\$130,615 for 10.3 mi. grade., shaping, watering, rolling, leveling and surf., on State Hwy. 58, betw. Springer and Clayton—by State Hwy. Dept., Santa Fe. 2-25

Oregon

MARION CO.—Kuckenberg Construction Co., 11104 NE. Holman, Portland—\$387,929 for 3.5 mi. grade, and bitu. macadam surf. on the Gates-Niagara section of N. Santiam secondary hwy.—by State Hwy. Commission, Portland. 2-14

Texas

BEXAR CO.—J. W. Perry, 501 Insurance Bldg., San Antonio—base, paving and curb, storm drains in Tracts 64 and 65, Terrell Hills, San Antonio—by Walter J. Bergstrom, San Antonio. 2-22

CLAY CO.—Fred Hall & Sons, Waco—\$267,486 for 23 mi. grade, and structures on Hwy. 148—by State Hwy. Dept., Austin. 2-4

COLEMAN CO.—Thomas & Ratliff, Rogers—\$96,761 for 9.8 mi. grade., structures and treat.—by State Hwy. Dept., Austin. 2-4

COLLIN CO.—Collins Construction Co., P. O. Box 1192, Austin—\$227,121 for 10.65 mi. of base and surf. on Hwy. 24—by State Hwy. Dept., Austin. 2-4

COOKE CO.—Harry Newton, Graham—\$86,980 for 10.7 mi. of base and surf.—by State Hwy. Dept., Austin. 2-4

CULBERTSON CO.—Jack C. Vowell & Lee Moor Contracting Co., Box 253, El Paso—\$198,965 for 16.3 mi. of Sulphur Creek bridge, grade., structures and surf. on U. S. 54—by State Hwy. Dept., Austin. 2-4

DALLAS CO.—Texas Bitulithic Co., 111 W. Commerce St., Dallas—improvements on Poydras St., Elm to Pacific, Dallas—by City Council, Dallas. 2-6

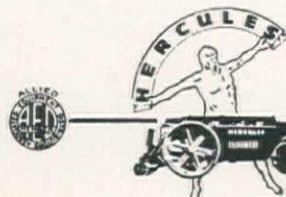
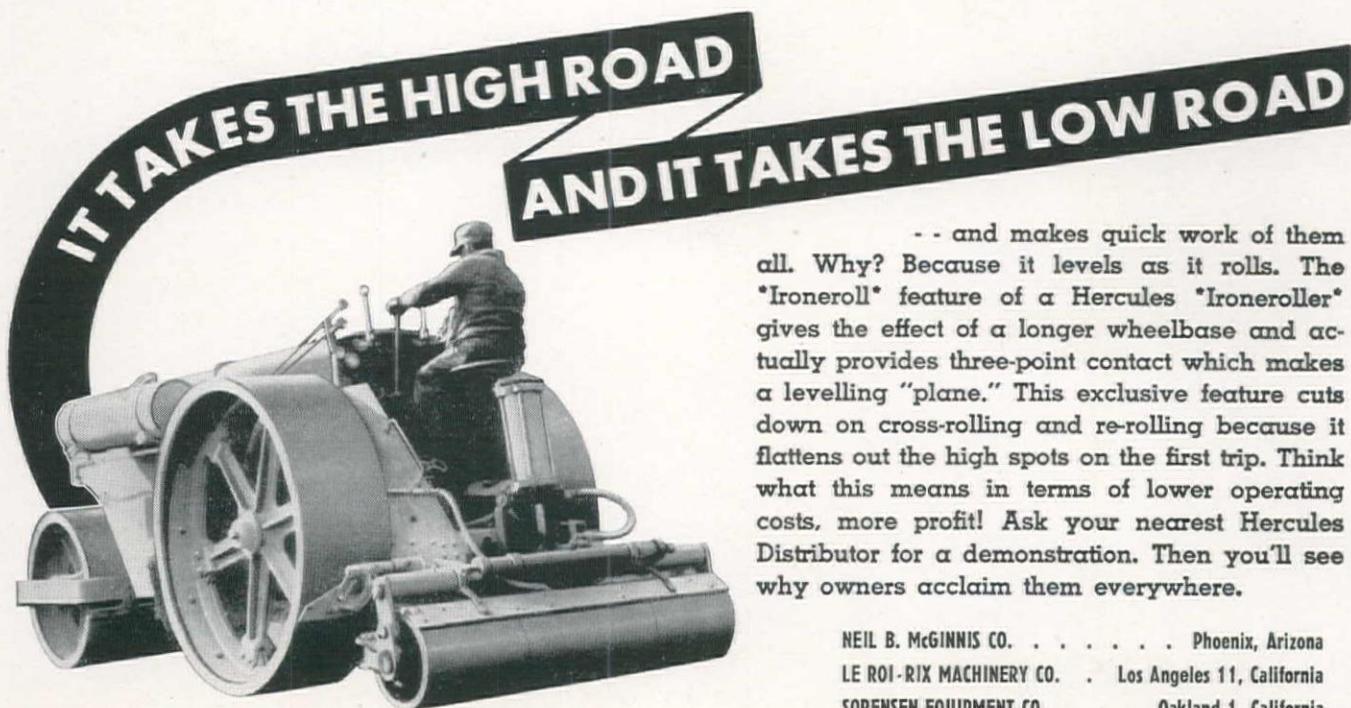
EL PASO CO.—Public Construction Co., Box 380, Denton—\$86,406 for 17.2 mi. grade, and surf. on Hwy. FM 76—by State Hwy. Dept., Austin. 2-4

ERATH CO.—Fred Hall & Sons, Waco—\$60,483 for 4.3 mi. grade., structures and base on Hwy. 108—by State Hwy. Dept., Austin. 2-4

GLASSOCK CO.—Gaylord Construction Co., Box 6157, Houston—\$97,430 for 14.7 mi. grade., structures and surf.—by State Hwy. Dept., Austin. 2-4

MENARD CO.—Schwoppe Brothers, 1014 W. Laurel St., San Antonio—\$100,572 for 5.4 mi. grade., structures and surf.—by State Hwy. Dept., Austin. 2-4

MONTAGUE CO.—John F. Buckner, Box 76, Cleburne—\$42,011 for 9.2 mi. of grade., structures and surf. on Hwy. FM 103—by State Hwy. Dept., Austin. 2-4



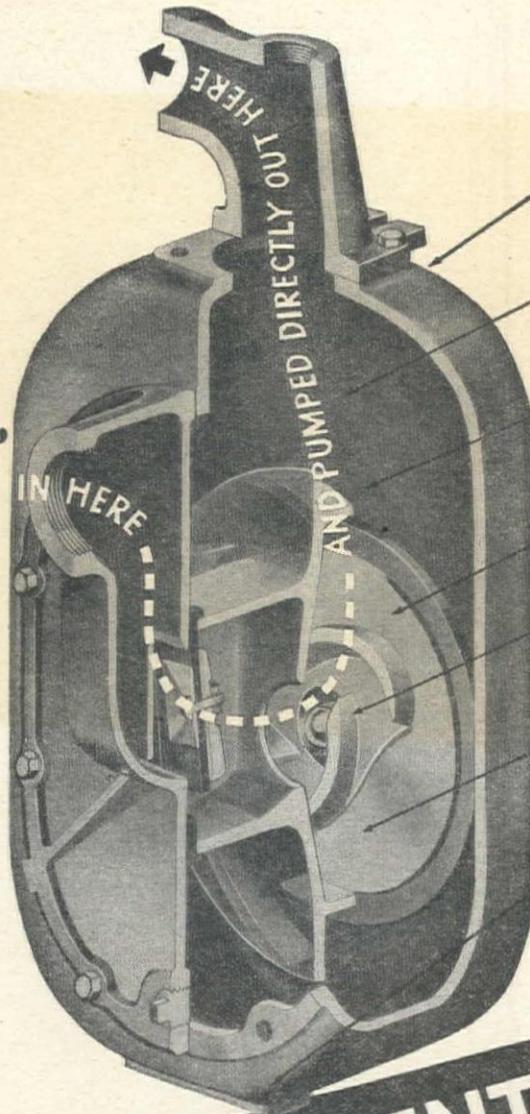
HERCULES

HERCULES ROLLER CO., BUCYRUS, O.

... and makes quick work of them all. Why? Because it levels as it rolls. The "Ironeroll" feature of a Hercules "Ironeroller" gives the effect of a longer wheelbase and actually provides three-point contact which makes a levelling "plane." This exclusive feature cuts down on cross-rolling and re-rolling because it flattens out the high spots on the first trip. Think what this means in terms of lower operating costs, more profit! Ask your nearest Hercules Distributor for a demonstration. Then you'll see why owners acclaim them everywhere.

NEIL B. McGINNIS CO. Phoenix, Arizona
LE ROI-RIX MACHINERY CO. . . . Los Angeles 11, California
SORENSEN EQUIPMENT CO. Oakland 1, California
POWER EQUIPMENT COMPANY Denver, Colorado
TRACTOR & EQUIPMENT CO. Sidney, Montana
WESTMONT TRACTOR & EQUIP. CO. . . . Missoula, Montana
EQUIPMENT SUPPLY CO. El Paso, Texas
HOWARD-COOPER CORPORATION Seattle-Portland
SMOOT MACHINERY & SUPPLY CO. . . Salt Lake City 5, Utah

NO WASTED MOTION,
LIQUID IS DRAWN IN HERE



Strong, long-life construction.
Made to stand up far beyond
ordinary job requirements.

There's nothing complicated—no ports or
valves to clog or jam.

Most efficient design—stationary diffuser
within pump assures positive priming with-
out recirculation or wasted motion.

Impeller alone moves the liquid.

Fitted with the finest mechanical seal. It is
self-compensating for internal pump
pressures.

No parts which require adjustment or manip-
ulation. No parts to get out of order.

Positively self-cleaning. Needs no clean-out
hole or plate.

HOW MARLOW
"WATER WIZARDS"
ARE MADE TO...

PREVENT TROUBLE...

Marlow "Water Wizards" are original and different in design. They contain no ports, by-passes or other auxiliary devices that reduce efficiency and cause troubles. In these self-priming centrifugal pumps, there are no parts which require adjustment or manipulation. The impeller alone moves the liquid. Simple, efficient design prevents clogging, jamming or other problems.

Moreover, Marlow "Water Wizards" are constructed stronger than is necessary. They have an *extra margin of stamina*, which enables them to keep going dependably, even under extremely difficult conditions. No other pumps have such performance records.

You go a long way to prevent costly troubles on jobs when you use Marlow "Water Wizards". 1 1/2 to 10-inch sizes—3,000 to 240,000 gallons per hour. Send today for all the facts about these reliable pumps.

MARLOW PUMPS

RIDGEWOOD, NEW JERSEY

* Manufacturers of the World's Largest Line of Construction Pumps *

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



GOODALL AIR HOSE... Tough to beat on Tough Jobs!

Contractor's RUBBER

● Contractors from coast to coast select GOODALL to do the job speedier, cheaper, safer, because GOODALL has specialized in Contractor Rubber Products for years...Hose...Belting...Packing...Boots...Rubber Clothing...Industrial Rubber Specialties.

"75" years of "Know-How"

GOODALL RUBBER COMPANY

(CALIFORNIA)

LOS ANGELES 510-514 E. 4th St. SAN FRANCISCO 678-A Howard St. SALT LAKE CITY 251 W. South Temple St. SEATTLE 524½ First Ave., So. Michigan 2207 Sutter 7944 Phone 3-8021 Elliott 7043 Mills—Trenton, N. J., established 1870

MONTAGUE CO.—Schwope Brothers, 1014 W. Laurel St., San Antonio—\$106,625 for 0.4 mi. grade., structures and surf. on U. S. 82—by State Hwy. Dept., Austin. 2-4

PARMER CO.—Fred Halls & Sons, Waco—\$97,892 for 9.4 mi. of grade. and structures—by State Hwy. Dept., Austin. 2-4

RANDALL & ARMSTRONG COS.—Bell & Braden, Herring Hotel Bldg., Amarillo—\$118,029 for 19.8 mi. grade. and surf.—by State Hwy. Dept., Austin. 2-4

SAN PATRICIO CO.—Heldenfels Brothers, Rockport—\$179,724 for 9.6 mi. grade., structures and surf. on U. S. 181—by State Hwy. Dept., Austin. 2-4

SAN SABA CO.—Brazos Valley Construction Co., Mineral Wells 5—\$250,243 for 9 mi. grade. and structures on Hwy. 190—by State Hwy. Dept., Austin. 2-4

SCURRY CO.—Harry L. Campbell, 2435 Winton Ter., West, Fort Worth 4—\$58,748 for 5.7 mi. grade., structures, and surf. on Hwy. 612—by State Hwy. Dept., Austin. 2-4

TAYLOR & RUNNELS COS.—J. W. Perry, 501 Insurance Bldg., San Antonio—\$51,871 for 10 mi. grade., structures and surf. on Hwy. FM 53—by State Hwy. Dept., Austin. 2-4

Bridge & Grade Separation...

California

KERN CO.—E. W. Elliott Construction Co., 80 Laidley St., San Francisco—\$79,870 for steel beam bridge and 1 mi. grade. and surf., Freeman Gulch—by Dept. of Public Works, Sacramento. 2-20

LOS ANGELES CO.—Byerts & Dunn, 1131 N. Orange Grove Ave., Los Angeles—\$134,269 for reinf. conc. overcrossing on Hollywood Parkway at Benton Way, Los Angeles—by Dept. of Public Works, Sacramento. 2-5

TEHAMA CO.—J. D. Proctor and Dragline Rentals, Box 247, Point Richmond Station, Richmond—\$378,765 for 5 reinf. conc. slab bridges and widening of 2 conc. bridges, betw. Los Molinos and Red Bluff—by Dept. of Public Works, Sacramento. 2-1

Kansas

OSBORNE CO.—List & Clark Construction Co., 414 Railway Exchange Bldg., Kansas City, Mo.—\$150,022 for girder bridge—by State Hwy. Commission, Topeka. 1-23

RUSH CO.—E. W. Geiger, Leavenworth—\$16,166, \$14,772 and \$16,361 for 3 reinf. conc. slab bridges—by State Hwy. Commission, Topeka. 1-9

Texas

SOMERVELL CO.—Harry Newton, Graham—\$268,974 for .22 mi. of bridge—by State Hwy. Dept., Austin. 2-4

Airport...

California

SAN MATEO CO.—Kyne Construction Co., Bay Meadows Race Track, San Mateo—\$100,000 for Bay Meadows Airport—by self. 2-12

Water Supply...

California

ALAMEDA CO.—Haas Construction Co., 326 Merchants' Exchange Bldg., San Francisco—\$183,674 for additions to water system for fire hydrants and domestic supply, Naval Air Station, Alameda—by Public Works Office, 12th Naval District, San Francisco. 2-8

LOS ANGELES CO.—American Pipe & Construction Co., 4635 Firestone Blvd., Los Angeles—\$59,962 for 5330 lin. ft. of 20-in. water main, Harbor Ave., 9th St. and 10th St., Long Beach—by Long Beach Water Dept., Long Beach. 2-20

LOS ANGELES CO.—Phil Boskovich, 1718 W. Garvey Ave., El Monte—laying of 1,400 to 1,500 ft. of 6-in. water pipe line on Bess Ave. and Garvey Blvd., El Monte—by Burl Watson Realty Co., El Monte. 2-8

SAN FRANCISCO CO.—Guerin Bros., 208 S. Linden Ave., S. San Francisco—\$15,739 for 10-in. water main, water works to Main Drive, and 14-in. overflow pipe at Strawberry Hill reservoir, San Francisco—by Board of Park Commissioners, Golden Gate Park. 2-15

Utah

CACHE CO.—Young and Smith, 1678 Browning Ave., Salt Lake City 5—\$24,387 for 3,000 ft. pipeline in Logan Canyon—by City Council, Logan. 2-13

Washington

KING CO.—Paul Jarvis, Inc., 3951 6th NW, Seattle—\$164,016 for replacing portion of Cedar Falls wood stave penstock No. 5 with electrically-welded steel penstock, betw. Masonry Dam and Cedar Falls—by Board of Public Works, Seattle. 1-30

SNOHOMISH CO.—Gallagher, Kirk & Thomas, Tacoma—\$65,949 for construction of 250,000-gal. reservoir and 8 mi. of mains to serve N. Lake Stevens area—by Snohomish Co. Public Utility District No. 1, Everett. 2-9

Sewerage...

California

ALAMEDA CO.—Sam Hunter, 7701 San Leandro Blvd., Oakland—\$4,162 for storm sewer, W. side of Everett Street from Blanding Ave. to estuary, Alameda—by City Council, Alameda. 2-21

FRESNO CO.—Kovick Construction Co., 145 W. Shields Ave., Fresno—\$7,526 for sewers in Fairview Gardens and Annex, Fresno—by City Commissioners, Fresno. 2-8

LOS ANGELES CO.—Bebek and Brkich, 238 W. Florence Ave., Los Angeles—\$12,693 for additional sewage facilities for personnel center, Fort MacArthur—by U. S. District Engineer Office, Los Angeles. 1-31

LOS ANGELES CO.—George J. Bock Co., 1120 N. Las Palmas, Los Angeles—\$1,789 for installation of drainage lines at dairy, Norwalk State Hospital, Norwalk—by Div. of Architecture, Sacramento. 2-20

LOS ANGELES CO.—C. & L. Construction Co., 1242 S. Bonnie Beach Pl., Los Angeles—\$8,369 for sanitary sewer lines and appurtenances in Currier, Date and Lewis Sts., Pomona—by City Council, Pomona. 1-25

LOS ANGELES CO.—Ivan Metkovich, 143 E. 81st St., Los Angeles—\$6,406 for sewers from Hayden St. to manhole 600 ft. E., Culver City—by City Council, Culver City. 2-1

LOS ANGELES CO.—A. R. Milosevich, 303 N. Alma St., Los Angeles—\$6,986 for 8-in. and 10-in. vitrified clay sewer in Del Rey Ave., N. Foothill Blvd. and Bridgen Rd., Pasadena—by City Council, Pasadena. 1-25

LOS ANGELES CO.—R. A. Wattson Co., 5528 Vineland Ave., N. Hollywood—\$10,672 for sewers in Amalfi Dr. and Capri Dr., Los Angeles—by Board of Public Works, Los Angeles. 2-1

SAN FRANCISCO CO.—M. & K. Corp., 200 Financial Center Bldg., San Francisco—\$796,990 for Scott St. sewer system, on 17th, Church, 14th, Sanchez and Steiner Sts., betw. Treat Ave. and Waller St., San Francisco—by Dept. of Public Works, San Francisco. 2-21

SAN FRANCISCO CO.—M. & K. Corp., 200 Financial Center Bldg., San Francisco—\$116,946 for Upper Army sewer system "A," Church St., 25th to 27th Sts., San Francisco—by Dept. of Public Works, San Francisco. 2-7

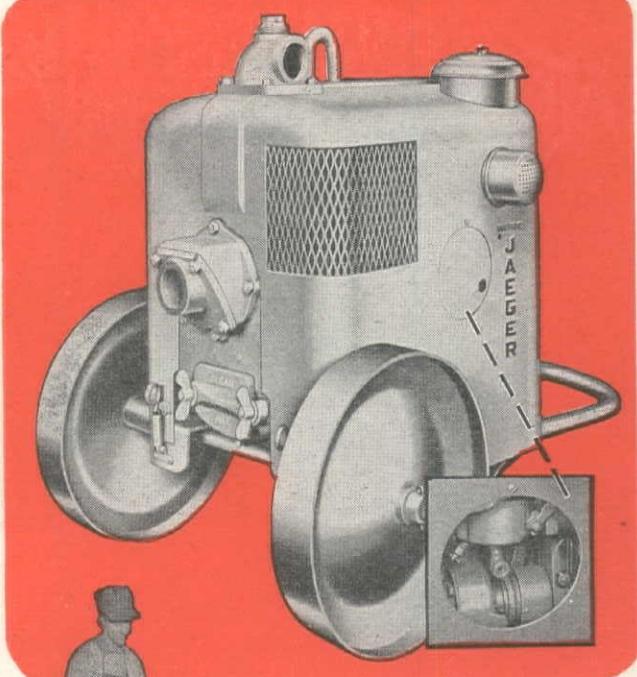
SAN JOAQUIN CO.—A. Teichert & Son, Inc., Box 1113, Sacramento—\$80,047 for additional drainage systems and extensions of motor parking area, U. S. Naval Supply Annex, Stockton—by officer in charge of construction, U. S. Naval Supply Annex, Stockton. 2-8

SANTA CLARA CO.—A. J. Peters & Son, 410 N. 10th St., San Jose—\$7,333 for sanitary sewers on Tully Rd., San Jose—by Santa Clara Co. Board of Supervisors, San Jose. 2-26

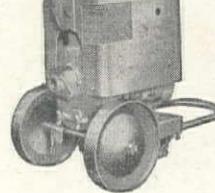
Oregon

MULTNOMAH CO.—James & Yost, 19 SE. 8th Ave., Portland—\$60,000 for 3 mi. of conc. pipe sanitary sewers at Guild's Lake yard—by Northern Pacific Terminal Co., Portland. 1-28

PROTECTED YET FULLY ACCESSIBLE



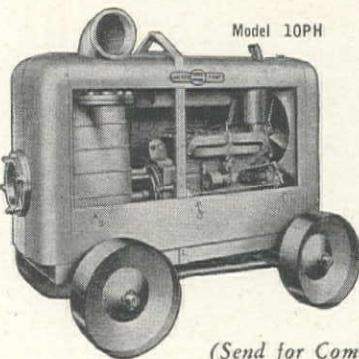
Instant-opening side panels. Enclosures also lift off or swing open for complete access.



JAEGER

keeps the engine as efficient as the pump

These latest model Jaegers handle more water because they keep it from your sparkplugs, carburetor and the crankcase, insure a dry, quick-starting and efficient engine to match the efficiency and long life of your Jaeger "Sure Prime" pump. Enclosures on small pumps swiftly lift off when needed. On larger models the big Jaeger housing permits far easier accessibility to all engine parts. Add this to many other reasons why Jaeger outsells and out-performs all other pumps.



- More efficient power
- Inherent priming action plus "jet" priming—faster and doubly sure.
- Replaceable liners or seal rings in all sizes.
- All seals accessible for quick inspection.
- Micrometer workmanship.
- Certified performance.

(Send for Complete Catalog P-45.)

• EDWARD R. BACON CO.	San Francisco 10, Calif.
• SMITH BOOTH USHER CO.	Los Angeles 54, Calif.
• A. H. COX & CO.	and Phoenix, Ariz.
• NELSON EQUIPMENT CO.	Seattle 4, Wash.
• CONNELLY MACHINERY CO.	Portland 14, Ore.
• WESTERN MACHINERY COMPANY	Spokane, Wash., Twin Falls, Ida.
• HARDIN & COGGINS	Bilings, Great Falls, Mont.
• TRACTOR & EQUIPMENT CO.	Salt Lake City 13, Utah,
• WORTHAM MACHINERY CO.	and Denver 2, Colo.
• MOUNTAIN TRACTOR CO.	Albuquerque, N. M.
	Sidney, Mont.
	Cheyenne, Wyo.
	Missoula, Mont.

Anthony HAS IT...

CONSTRUCTION EQUIPMENT THAT KEEPS TRUCKS ON THE MOVE

- Anthony "Super" Hydraulic Hoists and Bodies, up to 30 ton capacity—with "power speed lift" and "rubber restraining blocks," two of many features that explain the evident preference for Anthony equipment on the job.

- Anthony Hydraulic Lift Gate . . . one of the remarkable new war-developed pieces of equipment for loading and unloading. Raises and lowers loads from ground to truck level.

- Anthony Material Spreader . . . rugged, all steel; for road building, maintenance and ice control.

- Anthony Hydraulic Platform "Booster" Hoists, especially designed to make dump bodies out of flat bed trucks.

Available through the following distributors:

LOS ANGELES 21, CALIF.
Lambert Company, Ltd.
1202 E. Olympic Blvd.

OAKLAND, CALIF.
Ruckstell California Sales
2985 Ford St.

BOISE, IDAHO
Olson Mfg. Co.
P. O. Box 1487

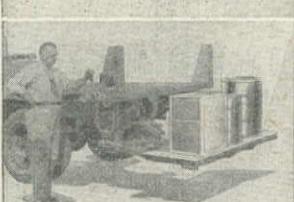
PORTRLAND 8, ORE.
Gunderson Brothers
4700 Northwest Front Ave.

SEATTLE 9, WASH.
Nelson Truck Equipment Co., Inc.
128 Westlake Ave., N.

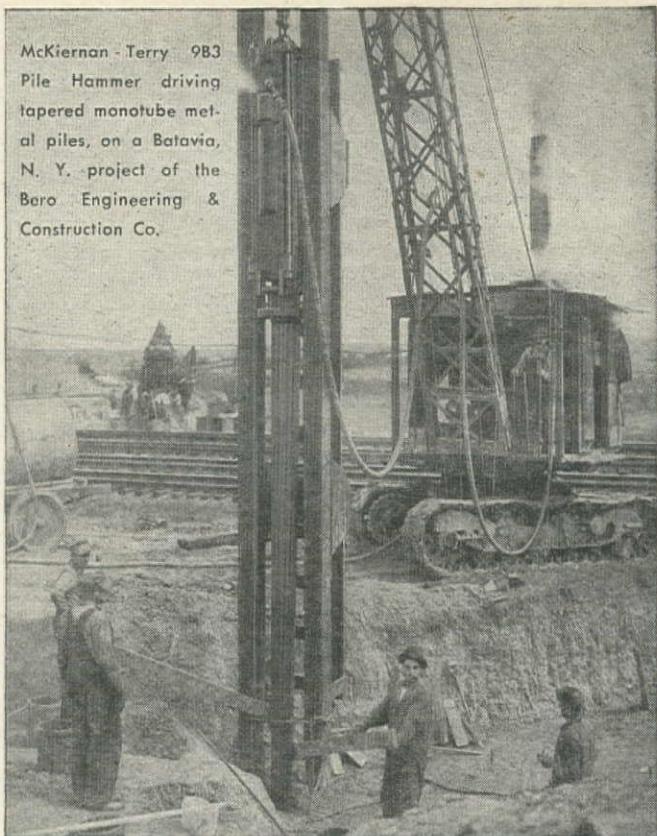
SPOKANE 9, WASH.
Andrews Equipment Service
126 S. Walnut St.

ANTHONY
HYDRAULIC

Manufactured by **ANTHONY CO.** Streator, Ill.



McKiernan-Terry 983
Pile Hammer driving
tapered monotube metal
piles, on a Batavia,
N. Y. project of the
Bero Engineering &
Construction Co.



EQUIPPED FOR ANY PILE DRIVING PROBLEM

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

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

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

WRITE FOR FREE BULLETINS

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



McKiernan-Terry
CORPORATION

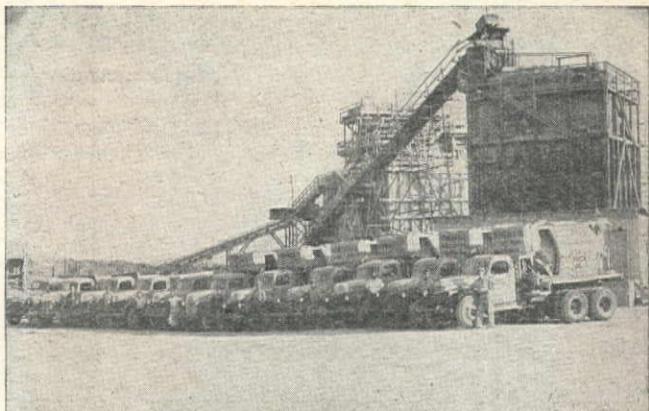
16 PARK ROW

NEW YORK 7, N. Y.

PREFERRED By Fleet Owners!

OF ABOUT a dozen firms engaged in the fast growing ready-mix concrete service in Southern California approximately 90% depend on Cook Bros. Chain Drives for hauling their concrete, each load weighing around 37,000 lbs. gross. The reasons: (1) C-B units are of proved engineering design. (2) Ease of installation and servicing. (3) Efficiency and dependability in operation, providing peak performance both on and off the highway. (5) Repair parts being always available, even on earliest models.

A very high percentage of concrete poured in this area on major Defense Projects (highly essential to the war effort) was hauled with C-B chain drives. The demand has grown to where fleets of 20, 30 and 40 ready-mix trucks with C-B units are not uncommon. The C-B chain drive is available for any make or model truck. Send for literature today!



Photos above show part of fleets of Arrow Rock Co. (top), Consolidated Rock Products Co. (center), and Western Concrete & Equipment Co. (below). Over a hundred Cook Bros. Chain Drives are owned by these three firms alone, installed on their ready-mix concrete trucks.

COOK BROS. [C. B. Equipment Co. Div.]

1800 Pasadena Avenue, Los Angeles 31, California



Distributors:

L. H. PIERCE AUTO SERVICE
1306 S. E. Ninth Avenue, Portland, Oregon

COOK BROS. EQUIPMENT DISTR. S.
416 E. 8th Street, Oakland, California

For HEAVY DUTY HAULING

Texas

BEXAR CO.—Wahrmund-Logan Co., 422 Hays St., San Antonio—\$26,165 for sewers, Bel Meade addition, San Antonio—by Steves Brothers, Inc., San Antonio. 2-18

DALLAS CO.—Russ Mitchell, Inc., 2302 Jefferson Ave., Houston—\$379,449 for Cedar Creek sanitary sewers—by City Council, Dallas. 2-7

Washington

COWLITZ CO.—Amozone of Oregon, SE. 8th and Madison Sts., Portland—\$30,000 for sewage disposal plant, Kelso—by City Council, Kelso. 2-27

Waterway . . .

California

LOS ANGELES CO.—Guy F. Atkinson Co., 1103 Heartwell Bldg., Long Beach—\$134,000 for reinf. conc. dock for flying boat under construction, Terminal Island—by Hughes Aircraft Co., Mar Vista. 2-7

Washington

PACIFIC CO.—Kirkman & Strand, Seaview—\$18,491 for construction of float, dock and approach, South Bend—by City Engineer's Office, South Bend. 2-4

Irrigation . . .

California

RIVERSIDE CO.—Morrison-Knudsen Co., 810 Title Guarantee Bldg., Los Angeles, and J. F. Shea Co., 617 S. Olive St., Los Angeles—\$1,228,841 (joint bid) for earthwork, conc. lining and structures, station 5150 plus 00 to station 5725 plus 00, Coachella Canal, near Indio—by Bureau of Reclamation, Yuma, Ariz. 2-25

SACRAMENTO CO.—T. E. Connolly, Inc., 461 Market St., San Francisco—\$27,032 for levee setbacks, 6 locations on San Joaquin River—by U. S. Engineer Office, Sacramento. 2-25

Montana

GRANITE CO.—Otis Williams and Co., Helena—\$129,951 for work on distribution system to serve 900 ac. of land, near Bitterroot River, Missoula Valley Reclamation Project—by Bureau of Reclamation, Washington, D. C. 2-19

PHILLIPS CO.—Union Construction Co., Box 1845, Great Falls—\$52,582 for pumping plant, earthwork and structures, canal and laterals, Dodson, Milk River project—by Bureau of Reclamation, Washington, D. C. 2-16

Oklahoma

JACKSON CO.—Luther Bros. Construction Co., Fort Worth—\$255,482 for earthwork and structures, sta. 376 plus 87.5 to sta. 610, Altus Canal, Altus laterals 2.8 and 9.9 and sublateral 1, Altus Project, 1 to 11 mi. N. of Altus—by Bureau of Reclamation, Washington, D. C. 2-25

Texas

HIDALGO CO.—Miller Construction Co., Box 773, Shreveport, La.—\$168,270 for main floodway pilot channel drain—by International Boundary and Water Commission, El Paso. 12-27

Building . . .

Arizona

MARICOPA CO.—Gay Engineering Co., Phoenix—\$400,000 for ice bldg. with capacity of 300 tons daily, on 10-ac. tract W. of Santa Fe R. R. tracks, Six Points—by Shippers Ice Co., Phoenix. 1-28

MARICOPA CO.—Alfred Knight, Phoenix—\$75,000 to \$90,000 for women's apparel store bldg., 25-31 East Adams St., Phoenix—by Switzer's, Phoenix. 2-12



ONE TRACTOR FOR MANY JOBS

MM Industrial Tractors . . . offered in 3 sizes from 27 H. P. to 64 H. P. . . . are ideal for heavy drawbar work pulling road maintainers, wheeled scrapers, sheep's foot tampers, and carry-alls, as well as for use with loaders, material buckets, snow plows, bull-dozers, rotary brooms, street flushers, highway mowers, etc. Balanced weight and power for good traction and ease of handling, wide range of forward speeds, high speed reverse gear, and short turning radius make MM Industrial Tractors ideal for all-around drawbar work. Heavy front axle and tire equipment, heavy cast wheels front and rear, front power take-off drive for hydraulic or mechanical lifts, and special Ross steering gear with Twin lever adapt MM Industrial tractors for use with mounted attachments.

Complete specifications will be furnished on request. Also get facts on the new MM side-mounted highway mower.

MM DEALER-DISTRIBUTORS NEAR EVERYWHERE

**MINNEAPOLIS-MOLINE
POWER IMPLEMENT COMPANY**

MINNEAPOLIS 1, MINNESOTA, U. S. A.

MARICOPA CO.—J. W. Lillywhite Construction Co., Phoenix—\$60,000 for business block bldg., 1640 E. McDowell Rd., Phoenix—by Nick Klim, Phoenix. 1-16

MARICOPA CO.—Del E. Webb Construction Co., 302 S. 23rd Ave., Phoenix—\$225,000 for 2-story and basement store bldg., 1st and Adams Sts., Phoenix—by Vic Hanny Co., Phoenix. 2-9

MARICOPA CO.—Del E. Webb Construction Co., 302 S. 23rd Ave., Phoenix—\$50,000 for 1-story and penthouse bldg. for wholesale coffee roasters and distributors, 1220 E. Jackson St., Phoenix—by Barabee Brothers, Phoenix. 1-27

MARICOPA CO.—Womack Construction Co., Box 2414, Phoenix—motion picture house, First Ave. and Macdonald St., Mesa—by Harry L. Nace Theaters, Inc., Phoenix. 1-28

MARICOPA CO.—Womack Construction Co., Box 2414, Phoenix—\$120,000 for 12-storeroom bldg., 16th St. and Thomas Rd., Phoenix—by Walter Ong, Phoenix. 2-12

VARIOUS COS.—Del E. Webb Construction Co., 302 S. 23rd Ave., Phoenix—500 dwelling units, dormitories moved and Quonset huts erected, throughout state—by Federal Public Housing Authority. 2-1

California

ALAMEDA CO.—Beckett and Federighi, 1441 Franklin St., Oakland—\$100,000 for 1-story reinf. conc. store bldg., 14th and Harrison Sts., Oakland—by M. R. Fairman, Oakland. 2-1

ALAMEDA CO.—Christensen & Lyons, 3454 Harlan St., Oakland—\$500,000 for 2-story reinf. conc. creamery and cheese manufacturing plant, 3rd and 4th Sts., Addison to Allston Way, Berkeley—by Challenge Cream & Butter Assn., Oakland. 2-25

ALAMEDA CO.—Empire Construction Co., Ltd., 344 Harriet St., San Francisco—\$132,450 for bldg. to contain 6 stores and 4 studio apartments, N. Grand Ave., E. of Euclid Ave., Oakland—by Foster W. Weeks, Oakland. 2-19

ALAMEDA CO.—Fluor Corp., 3rd and Virginia Sts., Berkeley—\$750,000 for reinf. conc. and structural steel office, factory and garage bldg., 3rd and Virginia Sts., Berkeley—by Pure Carbonic, Inc., Berkeley. 2-15

ALAMEDA CO.—Stolte, Inc., 8451 San Leandro St., Oakland—\$141,650 for 1- and 2-story frame and stucco 41-unit motel bldg., MacArthur Blvd., Oakland. 2-13

CONTRA COSTA CO.—Biltwell Construction Co., 4745 Geary Blvd., San Francisco—\$125,277 for 3-story reinf. conc. warehouse, 8th and Ohio Sts., Richmond—by Richmond Union School District, Richmond. 2-12

FRESNO CO.—Trewhitt, Shields and Fisher, 1501 Pacific Southwest Bldg., Fresno—\$650,000 for reinf. conc. cooperative winery plant, Fresno—by Del Rey Cooperative Winery Assoc., Fresno. 2-4

FRESNO CO.—Trewhitt, Shields & Fisher, 1501 Pacific Southwest Bldg., Fresno—\$400,000 for renovating and modernizing interior and exterior of 2-story and basement department store bldg., Fulton and Kern Sts., Fresno—by E. Gottschalk & Co., Inc., Fresno. 2-13

GLENN CO.—Berlinger Construction Co., P. O. Box 921, Chico—\$200,000 for conc. bulk grain storage plant and installation of 60-ft. scale, Tehama St., Willows—by Willows Rice Drier & Storage Co., Willows. 2-11

KERN CO.—Trewhitt, Shields & Fisher, Pacific Southwest Bldg., Fresno—\$150,000 for reinf. conc. theater bldg., Delano—by Frank Pinero, Delano. 2-22

LOS ANGELES CO.—Aetna Construction Co., 631 S. Witmer St., Los Angeles—\$180,000 for 3 18-room hotel bldgs., S. M. Mariposa Ave. and San Marino St., Los Angeles—by self. 2-15

LOS ANGELES CO.—Aetna Construction Co., 631 S. Witmer St., Los Angeles—\$240,000 for 4 2-story hotel bldgs., 1775 N. Sycamore Ave., Los Angeles—by self. 2-1

LOS ANGELES CO.—Baruch Corp., 625 S. Olive St., Los Angeles—\$3,081,000 for erection of approx. 750 Quonset huts, 1,500 housing units, Griffith Park, Los Angeles—by Federal Public Housing Authority, San Francisco. 2-1

LOS ANGELES CO.—Baruch Corp., 625 S. Olive St., Los Angeles—\$565,000 for medical bldg., 6383 Wilshire Blvd., Los Angeles—by Medical Holding Co., Los Angeles. 2-4

LOS ANGELES CO.—Buttress & McClellan, Inc., 1013 E. 8th St., Los Angeles—\$150,000 for 3-story factory bldg., 4340 Colo-

5 FACTS PROVE

★ LOWER FIRST COST. When you buy a Wood Roadmixer you buy only one piece of equipment.

★ LOWER MAINTENANCE COST: Pulled and powered by a standard crawler tractor.

★ TWO-MAN OPERATED: One man on tractor, one man on Roadmixer for average job.

★ HANDLES ALL MATERIALS: Road oils, emulsions, asphalt, soil-cement, etc.

★ MAXIMUM PRODUCTION: Wood Roadmixer produces in excess of 250 tons an hour of ready-to-spread mix.



WOOD ROADMIXER

THE WORLD'S LEADING TRAVEL PLANT

Low-cost native or local materials located at or near the site of the job can be used for paving with a Wood Roadmixer. This saving in labor and equipment often cuts the original cost of a job as much as two-thirds under other methods.

The Wood Roadmixer is the world's pioneer and leading travel plant method of rapid, low-cost pavement construction. For literature and prices, see your local Wood Roadmixer dealer or write direct.

ROADBUILDING
EQUIPMENT
WOOD MANUFACTURING CO.

BOX 620, 6900 TUJUNGA AVENUE • NORTH HOLLYWOOD, CALIFORNIA

rado Blvd., Los Angeles—by Red-EE-Foods, Los Angeles. 2-8

LOS ANGELES CO.—William Crowell, 170 East California St., Pasadena—conversion of 220 housing units in Army barracks, Long Beach—by Federal Public Housing Authority, San Francisco. 2-1

LOS ANGELES CO.—Burton F. Dinsmore, 2435 W. Main St., Alhambra—\$150,000 for 2,000-seat conc. block sports arena, restaurant and gym bldg., Atlantic Blvd. and Southern Pl., South Gate—by Frank Pasquale, South Gate. 2-15

LOS ANGELES CO.—Howard Hastings, Inc., 1135 N. Las Palmas Ave., Hollywood—\$90,000 for 1- and part 2-story factory bldg., 3603 Hayden St., Culver City—by Stanley Racow, Culver City. 2-1

LOS ANGELES CO.—Geo. J. Heltzer, 1068 S. Redondo Blvd., Los Angeles—\$70,000 for 8 6-room, frame and stucco dwellings, S. Doheny Dr. and S. Oakhurst Dr., W. Los Angeles—by self. 2-1

LOS ANGELES CO.—Ray L. Hommes, 6521 Wilshire Blvd., Los Angeles—\$81,000 for 3 6-family, 30-room frame and stucco apartment bldgs., Veteran Ave., W. Los Angeles—by Preferred Properties, Inc., Los Angeles. 2-1

LOS ANGELES CO.—Jackson Bros., 3475 W. 8th St., Los Angeles—\$90,000 for 1-story masonry store bldg., 6517 Atlantic, Bell—by J. C. Penney Co., Los Angeles. 1-25

LOS ANGELES CO.—H. S. Lamb, 3906 Wilshire Blvd., Los Angeles—\$100,000 for 2 22-family frame and stucco apartment bldgs., 106 and 112 N. Commonwealth Ave., Los Angeles—by J. C. Dunas, Los Angeles. 2-22

LOS ANGELES CO.—Lauer Bros. and O'Brien, 3724 Myrtle Ave., Long Beach—parochial school and convent, St. Barnabas Parish, 3980 Marron Ave., Long Beach—by Roman Catholic Archbishop, Long Beach. 1-25

LOS ANGELES CO.—Myers Bros., 3407 San Fernando Rd., Los Angeles—\$100,000 for alterations and renovating office bldg., 1483 Vine St., Hollywood—by Capitol Records, Inc., Hollywood. 2-22

LOS ANGELES CO.—Wm. P. Neil, Ltd., 4814 Loma Vista Ave., Los Angeles—\$79,293 for 1-story masonry and rigid steel frame industrial bldg., Santa Fe Ave. and 30th St., Vernon—by Electrical Tool & Supply Co., Vernon. 2-8

LOS ANGELES CO.—Axel Niska, 219 S. Witmer St., Los Angeles—\$250,000 for 50 4-room dwellings, Hawthorne Blvd. and 163rd St., Los Angeles—by self. 2-22

LOS ANGELES CO.—Fred E. Potts Co., 2516 12th Ave., Los Angeles—\$100,000 for air line offices, 501 W. 6th St., Los Angeles—by United Air Lines, Los Angeles. 2-22

LOS ANGELES CO.—Schwartz and Trevelyan, 7441 Sunset Blvd., Los Angeles—\$100,000 for 2 apartment bldgs., 330 Elmont Dr. and 330 Willaman Dr., Los Angeles—by selves. 2-8

LOS ANGELES CO.—E. G. Short, 266 Belmont Ave., Long Beach—\$100,000 for market bldg., Willow St. and Daisy Ave., Long Beach—by Californian Market, Long Beach. 2-8

LOS ANGELES CO.—Wm. Simpson Construction Co., 816 W. 5th St., Los Angeles—\$300,000 for 3 additional stories to reinf. conc. office bldg., 4680 Wilshire Blvd., Los Angeles—by Farmers' Automobile Inter-Insurance Exchange, Los Angeles. 2-8

LOS ANGELES CO.—Sam Slater, 5865 W. Adams, Los Angeles—for construction of 8 factory bldgs., Culver City—by Hayden Investment Co., Culver City. 2-25

LOS ANGELES CO.—Art A. Smith, 410 S. Westmoreland Ave., Los Angeles—\$75,000 for laboratory bldg., 630 San Vicente Blvd., W. Hollywood—by L. B. Laboratories, Inc., Los Angeles. 2-8

LOS ANGELES CO.—Steed Bros., Box 350, Alhambra—\$200,000 for 1,200-seat theater bldg., W. Garvey Ave., Monterey Park—by Edwards Theater Circuit, Los Angeles. 2-8

LOS ANGELES CO.—Store Builders, Inc., 1614 E. 15th St., Los Angeles—\$120,000 for 2-story store bldg., 266 N. Beverly Dr., Beverly Hills—by M. B. Cohn, Beverly Hills. 2-1

LOS ANGELES CO.—C. T. and W. P. Stover, 116 N. Alexander Ave., Claremont—\$340,000 for reinf. conc. dormitory bldg., Pomona College, Claremont—by Board of Regents, Pomona College. 2-1

LOS ANGELES CO.—P. J. Walker Co., 3900 Whiteside Ave., Los Angeles—additions to department store, 3050 Wilshire Blvd., Los Angeles—by Bullock's Wilshire, Los Angeles. 2-8

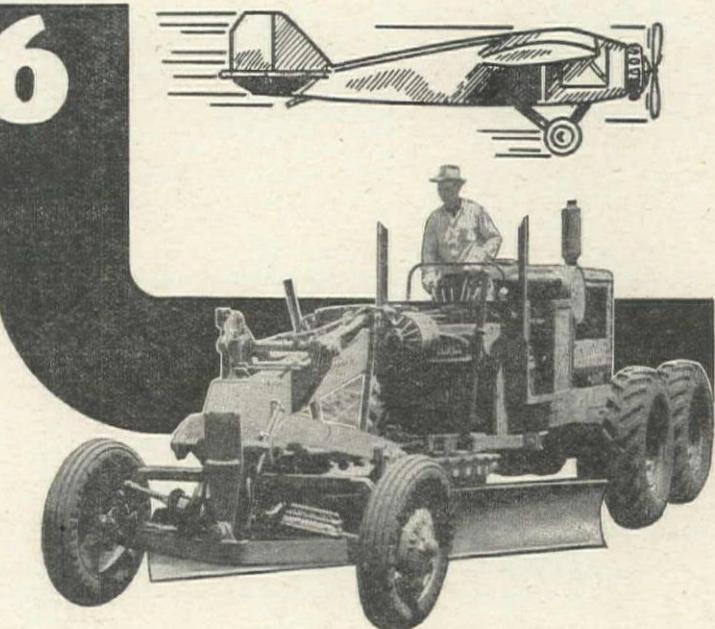
IN 1926

Lindy was laying plans for his epoch making hop to Paris. Cal Coolidge was thumbing through the dictionary looking for an astute way to say he wouldn't be in the coming Presidential race.

Among these and many other events of greater or lesser importance, a significant development was launched and tested in a small Ohio town. The W. A. Riddell Corporation was completing the first hydraulic-controlled motor grader.

There has been much refinement and improvement since that first model but the fact that Riddell was first with such an important feature is indicative of the company's thoroughly progressive position in the industry.

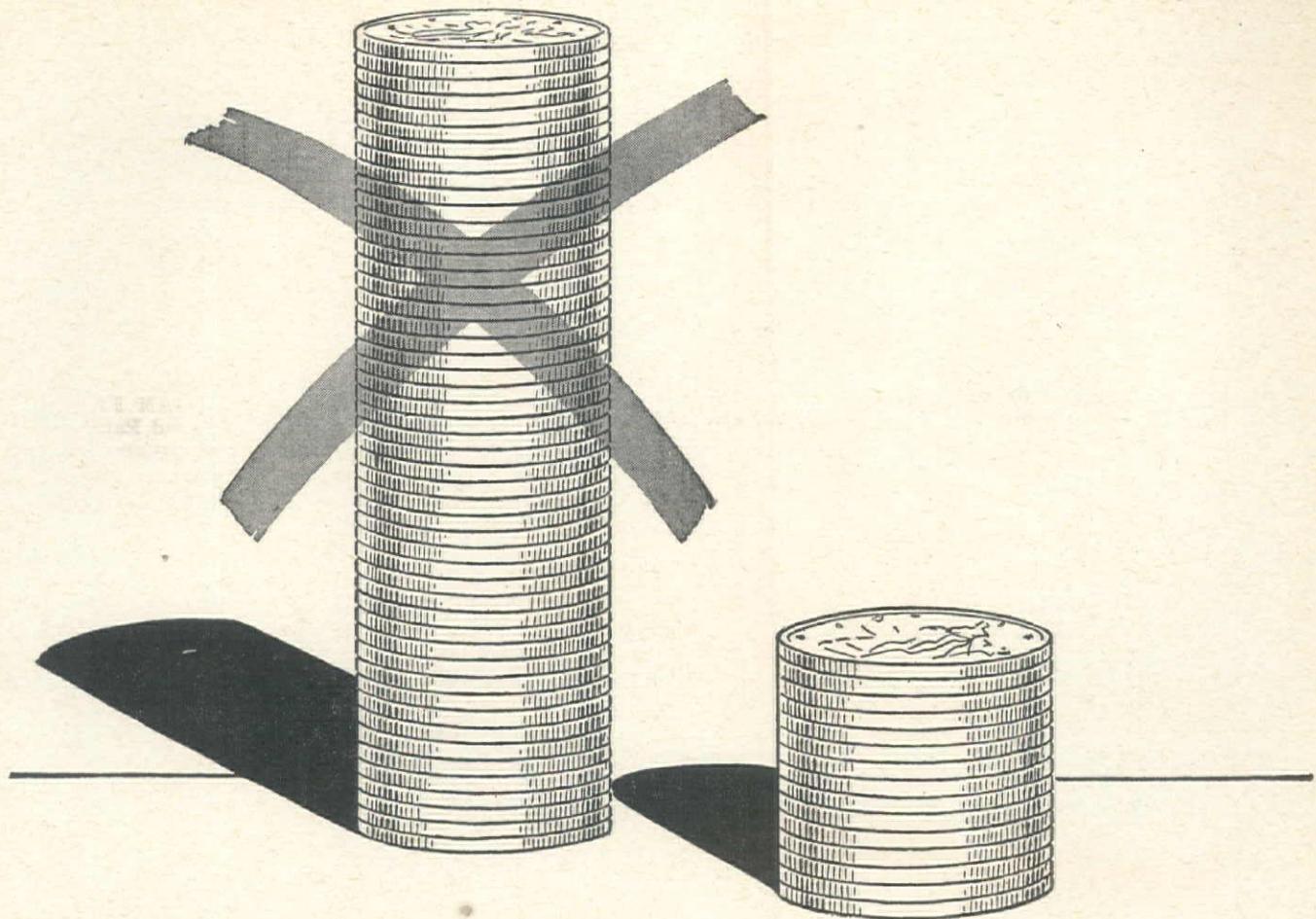
Warco distributors are also progressive and reliable. Ask one of them for more information about the 1946 Motor Grader.



WARCO DISTRIBUTORS

MINE & SMELTER EQUIPMENT CO. Phoenix, Arizona
 LE ROI-RIX MACHINERY CO. Los Angeles, Calif.
 SORENSEN EQUIPMENT CO. Oakland 1, Calif.
 FEENAUGHTY MACHINERY CO., Boise, Ida.; Portland, Ore.; Seattle and Spokane, Wash.
 CONTRACTORS EQUIPT. & SUPPLY CO., Albuquerque, N. M.
 SMOOT MACHINERY & SUPPLY CO., Salt Lake City 5, Utah

WARCO
 W. A. RIDDELL CORP.  BUCYRUS, O.



Reduction in Capital Investment An Important Factor in The Economics of Cathodic Protection

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

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

Barrett Coal-tar Enamel, which possesses high

dielectric strength, provides constant, uniform and long-lasting stable underground insulation, and retains electrical stability over a long period of years and under varying conditions of soil and climate!

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

THE BARRETT DIVISION ALLIED CHEMICAL & DYE CORPORATION

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

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



LOS ANGELES AND ADJACENT COS.—Daley Bros., 426 Bryant St., San Francisco—1,450 family housing units moved from Washington and Oregon to cities and schools around Los Angeles Co.—by Federal Public Housing Authority, San Francisco. 2-1

MARIN CO.—De Luca & Son, 1745 Filbert St., San Francisco—\$73,700 for 1- and part 2-story market and store bldg., Mill Valley—by H. W. Johnson and H. T. Lenzi, San Francisco. 2-27

MERCED CO.—Paul D. McCombs, 648 19th St., Merced—\$100,000 for reinf. conc. ice cream factory and ice storage addition, Merced—by Merced Dairy Co., Merced. 2-21

PLACER CO.—H. W. Robertson, 2917 T St., Sacramento—\$150,000 for cold storage plant addition, Lincoln—by Lincoln Packing Corp., Lincoln. 2-27

RIVERSIDE CO.—James W. Gregory, 5360 Arlington Ave., Riverside—\$140,000 for church bldg., Sierra Vista and Pierce Sts., La Sierra—by Seventh Day Adventists Church, La Sierra. 2-1

RIVERSIDE CO.—E. A. Thompson, 3128 Mulberry, Riverside—\$75,000 to \$100,000 for struct. steel and conc. farm equipment sales and service bldg., 8th St. near Chicago Ave., Riverside—by Braman-Dickerson Co., Riverside. 2-1

RIVERSIDE CO.—Waale-Camplan Co. & Smith, Inc., 1670 Beverly Blvd., Los Angeles—1- and part 2-story masonry and stucco hotel bldg., 416 S. Spring St., Palm Springs—by Bisno Bros. & Associates, Palm Springs. 2-1

RIVERSIDE CO.—Waale-Camplan Co. & Smith, Inc., 1670 Beverly Blvd., Los Angeles—\$250,000 for 30-unit bungalow hotel, 13 bldgs. of reinf. cement block and conc. swimming pool, Palm Springs—by Samuel H. Levin, Los Angeles. 2-13

SACRAMENTO CO.—Campbell Construction Co., 800 R St., Sacramento—\$1,000,000 for remodeling physicians' bldg. to provide 70,000 sq. ft. floor space for apparel store, 10th and K Sts., Sacramento—by Roos Bros., Inc., lessees, San Francisco. 2-25

SACRAMENTO CO.—Stolte, Inc., 8451 San Leandro St., Oakland—\$125,000 for reinf. conc. cold storage plant at Hood—by Stillwater Orchards Co., Courtland. 2-1

SAN BERNARDINO CO.—Bard Construction Co., 3902 W. 6th St., Los Angeles—\$100,000 for theater and store bldg., 9th St. and Third Ave., Upland—by Grove Theater, Upland. 2-15

SAN BERNARDINO CO.—Gordon Donald, 50 E. Vine St., Redlands—\$100,000 for steel frame and conc. packing house bldg., 7th St., and U. P. Railroad tracks, Redlands—by Fred A. Hill, Redlands. 2-1

SAN BERNARDINO CO.—Kaiser-Frazer Corp., Fontana—10 to 15 million dollars for steel strip mill addition to steel plant, Fontana—by self. 2-1

SAN FRANCISCO CO.—Barrett & Hilp, 918 Harrison St., San Francisco—\$2,000,000 for 10-story bldg. and 2-story basement garage, reinf. conc. and structural steel medical-dental bldg., 1350 Post St., San Francisco. 2-4

SAN FRANCISCO CO.—Cahill Bros.,

206 Sansome St., San Francisco—\$750,000 for reinf. conc. and structural steel theater and recreational bldg., Geary St. and First Ave., San Francisco—by San Francisco Theaters, Inc., San Francisco. 2-1

SAN FRANCISCO CO.—Clinton Construction Co., 923 Folsom St., San Francisco—\$483,699 for warehouse for distribution of packaged petroleum products, 7th and Irwin St., San Francisco—by Standard of California, San Francisco. 2-25

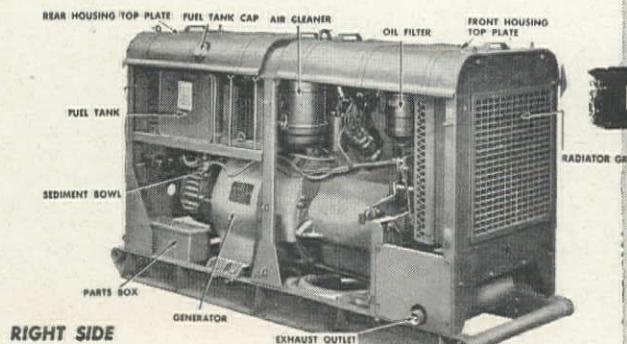
SAN FRANCISCO CO.—Erbentraut & Summers, 446 6th St., San Francisco—\$1,123,650 for 4-story reinf. conc. supply storehouse bldg., San Francisco Naval Shipyard—by Bureau of Yards and Docks, Washington, D. C. 2-20

SAN FRANCISCO CO.—Harney, Haas and Rothschild, 625 Market St., and Barrett and Hilp, 918 Harrison St., San Francisco—more than \$1,000,000 for buildings on Oakdale and Industrial Aves., San Francisco—by Apparel City Corp., San Francisco. 2-12

SAN FRANCISCO CO.—Jacks & Irvine, 620 Market St., San Francisco—remodel office bldg., California St., E. of Battery, San Francisco—by George Hart, San Francisco. 2-19

SAN JOAQUIN CO.—Geo. Pollock Co., Forum Bldg., Sacramento—\$62,000 for remodeling bldg., 117 S. Center St., Stockton. And \$80,000 for 2-story warehouse, 40 W. Market St., Stockton—by Centromart, Inc., Stockton. 2-27

SAN MATEO CO.—H. H. Larson Co., 64 South Park, San Francisco—\$59,632 for 2-story reinf. conc. class B bldg., near Bel-

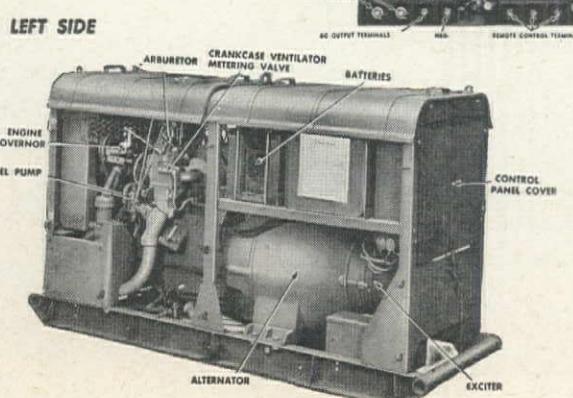


INSTRUMENT PANEL

DEPENDABLE PORTABLE ELECTRIC POWER

For Your Job!...

... BUILT IN FIVE SIZES,
ranging from 3 K. W. to 15 K. W.,
these portable electric power plants
are manufactured to give dependable
service under the most rugged con-
ditions. Write today for specifications.



10 K. W. power plant
as illustrated. Immediate
delivery.
\$1100
F. O. B. Los Angeles

DEALERS
WANTED!
Some profitable fran-
chises still available.
Write or wire

PIONEER ELECTRIC CO.

3700 East Olympic Boulevard
Los Angeles 23, California

mont—by Press Wireless, Inc., San Francisco. 2-20

SAN MATEO CO.—Moore & Roberts, 693 Mission St., San Francisco—\$100,000 for reinf. conc. theater bldg. to seat 800, Menlo Park—by Menlo Mayfield Theaters, Menlo Park. 2-11

SAN MATEO CO.—Peninsula Pacific Construction Co., Chestnut and Spring Sts., Redwood City—\$200,000 for 1-story reinf. conc. and frame store bldg., Santa Cruz Ave. near Chestnut St., Menlo Park—by Toss Chamberlain, Inc., Redwood City. 2-4

SAN MATEO CO.—C. L. Wold Construction Co., Ltd., 4412-16 Fulton St., San Francisco—\$69,900 for shops bldg., San Mateo Jr. College—by San Mateo Jr. College district, San Mateo. 2-18

SANTA BARBARA CO.—Wm. Simpson Construction Co., 816 W. 5th St., Los Angeles—\$200,000 for 2-story department store bldg., State St., Santa Barbara—by I. Magnin & Co., San Francisco. 2-1

SANTA CLARA CO.—Bridges Construction Co., 1071 Pine Ave., San Jose—\$65,000 for reinf. concrete religious publishing house, Stockton Ave. and Clinton St., San Jose—by Warner Press, Sacramento. 2-20

SANTA CLARA CO.—Erbentraut & Summers, 446 6th St., San Francisco—\$393,000 for steel frame and conc. wall laboratory bldg., Moffett Field—by Natl. Advisory Committee for Aeronautics, Moffett Field. 2-26

SANTA CLARA CO.—Earl W. Heple, 494 Delmas Ave., San Jose—\$200,000 for 1-story reinf. conc. and frame and stucco cannery bldg., Campbell Ave., San Jose—by Jos. Kiser, San Jose. 2-22

SANTA CLARA CO.—Earl W. Heple, 494 Delmas Ave., San Jose—\$300,000 for receiving and processing plant, Sunnyvale—by Libby, McNeil & Libby Cannery, Sunnyvale. 1-30

SANTA CLARA CO.—Floyd H. Herring—\$1,000,000 for 160 5- and 6-room ranch type homes and 10 retail stores, Mabium Gardens, Union Ave., Los Gatos—by Dr. S. J. Leider, San Francisco. 2-13

SANTA CRUZ CO.—MacDonald Products Co., Santa Cruz—\$50,000 for department store, Pacific Ave. and Cathcart St., Santa Cruz—by J. C. Penney Co., Los Angeles. 1-31

VARIOUS COS.—Robert J. McCarthy, 1050 Kirkham St., San Francisco—750 dwelling units, 600 of them moved from Richmond and Vallejo, from San Francisco S. through Santa Barbara—by Federal Public Housing Authority, San Francisco. 2-1

VARIOUS COS.—M. & K., 200 Financial Center Bldg., San Francisco—315 housing units moved and converted, California N. of Sacramento—by Federal Public Housing Authority, San Francisco. 2-1

VARIOUS COS.—Schumaker & Evans Construction Co., 4007 West 6th St., Los Angeles—750 dwelling units, movement, on-site conversion, and Quonset hut erection, S. and E. of Los Angeles—by Federal Public Housing Authority, San Francisco. 2-1

Colorado

DENVER CO.—Mead & Mount, 422 Denver Natl. Bldg., Denver 2—construction of sales distribution and parts branch bldg., E. 40th Ave. betw. York St. and Colorado

Bld., Denver—by Ford Motor Co., Detroit, Mich. 2-5

DENVER CO.—Newstrom-Davis & Co., P. O. Box 366, Denver—\$425,000 for activities bldg. and dormitory, Colo. Woman's College, Denver—by Board of Regents, Colo. Woman's College. 2-15

Idaho

ADA CO.—J. H. Wise & Son, 1614 Harvey St., Boise—\$60,000 for 1-story reinf. conc. automobile sales bldg., Boise—by Broadway Holding Co., Boise. 2-9

CANYON CO.—Morrison-Knudsen Co., Inc., 319 Broadway, Boise—\$300,000 for ice manufacturing plant, 300,000 cu. ft. zero storage space, office bldg. and engineering plant, Nampa—by Terminal Ice &

Cold Storage Co., 320 NW Hoyt St., Portland. 2-25

Nevada

CLARK CO.—E. A. Ralston, 8163 W. Third St., Los Angeles, Calif.—\$450,000 for 30 hotel bungalows on Hwy. 91, Las Vegas—by Greg Bautzner, Las Vegas. 2-22

WASHOE CO.—Johnson, Drake & Piper, Inc., 1736 Franklin St., Oakland 12, Calif.—\$50,000 for 2-story medical arts bldg., Chestnut and 5th Sts., Reno—by Dr. R. P. Rheuben, Reno. 2-18

VARIOUS COS.—M. & K. Construction Co., 200 Financial Center Bldg., San Francisco—94 housing units moved and converted, throughout state—by Federal Public Housing Authority, San Francisco. 2-1



3-AXLE TANDEMS

9 to 17 tons

•

TANDEM ROLLERS

3 to 14 tons

•

3-WHEEL ROLLERS

6 to 12 tons

•

TRENCH ROLLERS

... the 3-axle tandem

SURFACE irregularities vanish under the 3-axle tandem. As any one roll contacts a high spot, it automatically "borrows" additional weight for greater compaction. This, together with exclusive Buffalo-Springfield *synchronized steering* of the two guide rolls makes possible smoothness of rolling not possible with any other equipment. Ask your distributor for details.



BUFFALO-SPRINGFIELD

The Buffalo-Springfield Roller Co.
Springfield, Ohio

BUFFALO-SPRINGFIELD DISTRIBUTORS: Clyde Equipment Co., Seattle, Wash.; Construction Equipment Co., Spokane 1, Wash.; Ray Corson Machinery Co., Denver 2, Colo.; Landes Engineering Co., Salt Lake City, Utah; Cramer Machinery Company, Portland, Ore.; Creek Company, Los Angeles 11, Calif.; Intermountain Equipment Company, Boise, Idaho; Sierra Machinery Company, Reno, Nev.; Steffock Equipment Company, Helena, Mont.; Wortham Machinery Company, Cheyenne, Sheridan and Greybull, Wyo.; Capital Tractor & Equipment Company, North Sacramento, Calif.; Spears-Wellis Machinery Company, Inc., Oakland 7, Calif.

Oregon

MALHEUR CO.—Sound Construction and Engineering Co., 1403 W. 45th St., Seattle—\$209,000 for quick freeze food processing plant, Ontario—by Bridgeford Co., San Diego, Calif. 2-13

MULTNOMAH CO.—Ross B. Hammond, 1241 Williams St., Portland—\$300,000 for engr. bldg., University of Portland, Portland—by University of Portland. 2-8

MULTNOMAH CO.—D. E. Settergren, Portland—\$55,364 for general remodeling of 2-story and basement bldg., Portland—by State Game Commission, Portland. 2-15

MULTNOMAH CO.—Oscar Wayman,

Lewis Bldg., Portland—\$65,000 for warehouse, N. Tillamook and Kerby Sts., Portland—by Triangle Milling Co., Portland. 2-9

Texas

BEXAR CO.—Becher and Becher, 341 N. Comal St., San Antonio—2 stran steel bldgs., 600 Block N. Zarzamora St., San Antonio—by Southwestern Stirrup Co., San Antonio. And one stran steel bldg.—by Glenn Foster Nash Co., San Antonio. Bldgs. furnished by General Supply Co., San Antonio. 2-4

BEXAR CO.—C. L. Browning, Jr., 812 Insurance Bldg., San Antonio—1-story

warehouse, 311 Probandt St., San Antonio—by Joske Brothers, San Antonio. 2-22

BEXAR CO.—Burford Construction Co., Box 5112, Dallas—2-story apartment bldg., stone, tile and stucco exterior, State Hwy. 2, just E. of intersection of Rittiman Rd.—by Ford-Montgomery Hotel Co., Wichita Falls. 2-13

BEXAR CO.—Home Construction Co., Travis Bldg., San Antonio—construction of 100 1-story 5- and 6-room houses, some frame and some brick, W. Huisache Ave., San Antonio—by self. 1-30

BEXAR CO.—G. W. Mitchell, 612 American Hospital & Life Bldg., San Antonio—\$110,635 for Unit 1, 3-story and mezzanine bldg., S. Flores St., San Antonio—by Mrs. Annie May White, San Antonio. 2-11

BEXAR CO.—G. E. Myer, 1760 Division Ave., S. San Antonio—construction of church bldg., 600 block Main Ave., S. San Antonio—by congregation of S. San Antonio Baptist Church, San Antonio. 2-28

BLANCO CO.—Roland W. Bindseil, Blanco—construction of commercial bldg., 3 units, solid rock foundation, Blanco—by self. 2-12

CAMERON CO.—E. D. Porter, Brownsville—construction of packing plant, 3 mi. from Brownsville—by Hausman Packing Plant, Brownsville. 2-14

DALLAS CO.—Burford Construction Co., Box 5112, Dallas—\$50,000 for 2-story brick, tile and conc. motor hotel, Dallas—by J. B. Malone, Dallas. 1-28

DALLAS CO.—Carrier Corp., 710 N. Harwood St., Dallas—\$140,500 for office bldg., 1621 Main St., Dallas—by Mable Richards, Dallas. 2-5

DALLAS CO.—L. F. Corrigan, 2206 Mercantile Bank Bldg., Dallas—\$60,000 for 2-story brick veneer apartment hotel, 4510 Lemmon Ave., and \$70,000 for 2-story masonry hotel, 3768 Lemmon Ave., Dallas—by self. 1-30

DALLAS CO.—Cowdin Brothers, 411 S. Haskell, Dallas—\$65,000 for 1-story masonry church bldg., 1801 W. Davis, Dallas. 2-5

DALLAS CO.—Cowdin Brothers, 411 S. Haskell Ave., Dallas—\$102,000 for warehouse and office bldg., steel frame construction, hollow tile and brick exterior, Dallas—by Purex Corp., Dallas. 2-7

DALLAS CO.—Cowdin Brothers, 411 S. Haskell St., Dallas—construction of 3-story, reinf. conc. business bldg., 1005 Elm St., Dallas—by Brooks Mays & Co., Dallas. 2-15

DALLAS CO.—Henger Construction Co., Dallas Natl. Bank Bldg., Dallas—4-story addition to bldg., Dallas—by Southwestern Life Insurance Co., Dallas. 2-19

DALLAS CO.—Robert E. McKee, Box 2848, Dallas—\$211,507 for nurses' home, Dallas—by St. Paul Hospital, Dallas. 2-25

DALLAS CO.—P. O'B. Montgomery, 913 S. Akard St., Dallas—\$127,900 for 1-story and basement, brick, stone and reinf. conc. bldg., Dallas—by Carpenter Paper Co., Dallas. 2-14

EL PASO CO.—W. A. Adams, El Paso—\$150,000 for 50 housing units, 1 and 4 rooms, N. of Hwy. 80, El Paso—by self. 2-7

EL PASO CO.—Ponsford Brothers, P. O. Box 1412, El Paso—\$50,000 for 1-story brick and stucco office and warehouse, 221



There's an OSGOOD that will do it...
FASTER • BETTER • MORE ECONOMICALLY!

To Help YOU Select Your OSGOOD

Type 5.....	3/8 cu. yard
Type 20.....	1/2 cu. yard
Type 50.....	1 cu. yard
Type 70.....	1 1/4 cu. yard
Type 80.....	1 1/2 cu. yard
Type 80.....	1 3/4 cu. yard
Type 91.....	2 cu. yard
Type 100.....	2 1/2 cu. yard

Today thousands of state, county, municipal and private postwar projects are waiting for the "green light." Thousands more are still being planned. Tomorrow all these projects will be underway . . . the greatest construction boom in the country's history, embracing every type and variety of construction work. And those who plan wisely will have OSGOOD equipment on these jobs, large and small.

Completing a century of service to the construction, excavating and materials handling fields, OSGOOD offers the most complete and advanced line of equipment in its history. Power shovels, cranes, draglines, backhoes, pile-drivers . . . crawler and pneumatic-tired mountings . . . diesel, gas or electric drive . . . embodying every advancement in design, construction and operation, including the famous OSGOOD Air Control and the new OSGOOD "Cushion" Clutch. See your nearest distributor, or write direct! It will pay you to know what OSGOOD can do for you!

THE
GENERAL
EXCAVATOR COMPANY
CRANES, DRAGLINES
AND SHOVELS
DIESEL, GAS, ELECTRIC

Associated with The General Excavator Company
OSGOOD
THE OSGOOD COMPANY • MARION, OHIO



FOR DETAILS, CONTACT

General Machinery Co., Spokane, Wash.; Wood Tractor Co., Portland, Ore.; M. M. McDowell & Sons, Seattle, Wash.; Power Equipment Co., Denver, Colo.; Hyman-Michaels Co., Los Angeles-San Francisco.

Mesa Ave., El Paso—by Given Bros. Shoe Co., El Paso. 2-22

KERR CO.—G. W. Mitchell, 612 American Hospital and Life Bldg., San Antonio—bldg. for office and warehouse, 10,000 sq. ft., Kerrville—by H. W. Little, Inc., Uvalde. 2-7

NUECES CO.—E. E. Harrison, P. O. Box 162, Corpus Christi—additions to bldg.: indoor natatorium, 2 locker rooms, health club, social and game room, club room, luncheonette, kitchen, general office, 25 dormitory rooms, 417 S. Broadway, Corpus Christi—by Young Men's Christian Assoc., Corpus Christi. 2-19

RANDALL CO.—C. S. Lambie & Co., 725 Amarillo Bldg., Amarillo—\$80,000 for completion of Randall Hall for Girls, West Texas State Teachers College, Canyon—by Dr. J. A. Hill, president, West Texas State Teachers College. 1-29

TARRANT CO.—Henger Construction Co., Dallas Natl. Bank Bldg., Dallas—\$120,000 for 2-story telephone bldg., Eagle Dr., Fort Worth—by Southwestern Bell Telephone Co., Fort Worth. 2-27

TARRANT CO.—McCann Construction Co., 302 S. Main St., Fort Worth—removing 150 housing units from Amarillo to Fort Worth and 120 units from Orange to Fort Worth, University Pl. and Crestline Rd.—by Federal Public Housing Authority, Fort Worth. 2-25

TARRANT CO.—Oscar Quisle, First Natl. Bank Bldg., Fort Worth—\$540,542 for 2 dormitories at Texas Christian Univ., Fort Worth—by Dr. M. E. Sadler, president, Texas Christian Univ. 1-31

TARRANT CO.—Oscar Quisle, 907 First Natl. Bank Bldg., Fort Worth—\$60,000 for theater, Fort Worth—by A. J. Wylie, Fort Worth. 2-1

TRAVIS CO.—J. M. Odom, P. O. Box 774, Austin—\$119,950 for 1- and 2-story brick, stone, steel and reinf. conc. bottling plant, W. 6th and Taylor Sts., Austin—by Coca-Cola Bottling Co., Fort Worth. 1-18

TRAVIS CO.—J. B. Roberts, Austin—\$52,000 for 1-story bldg., 314 Lamar Blvd., Austin—by Austin Motor Truck Co., Austin. 2-4

Utah

SALT LAKE CO.—Vern B. Millard, Salt Lake City—\$70,000 for movie theater bldg., 2759 South, Salt Lake City—by Causby E. Overman, Salt Lake City. 1-31

VARIOUS COS.—M. & K. Construction Co., 200 Financial Center Bldg., San Francisco—389 housing units moved and converted, in cities and colleges of Utah—by Federal Public Housing Authority, San Francisco. 2-1

Washington

CHELAN CO.—Atherton Construction Co., Terminal Sales Bldg., Seattle 1—\$125,000 for hotel bldg., cedar siding exterior, at Appleyard—by Great Northern Railway, Seattle. 1-31

KING CO.—Peterson and Stevens, 1833 13th Ave., Seattle—\$330,000 for 55 homes in Ridgecrest housing development, E. 165th St., Seattle—by Carroll, Hillman and Hedlund, Seattle. 2-4

KING CO.—Geo. E. Teufel, 1141 Henry Bldg., Seattle 1—\$250,000 for 2-story bldg. for 6 or 8 retail stores, terra cotta exterior, 5th Ave. and Pike St., Seattle—by William Edris, Seattle. 1-28

New SISALKRAFT Method

Cuts Curing Costs in Half!



Increase your profits — get more for your money with the new Sisalkraft Method of concrete curing and protection! Developed and perfected in cooperation with road contractors from coast to coast, the new Sisalkraft Method of application gives you these big money-saving advantages—1) it's fast, easy — saves time and money, requires only two

men. 2) It's low cost, easy on blankets — increases number of reuses by more than 50%! Compare the Sisalkraft Method of road curing and protection with others! See how and why it lowers your costs and ups your profits. Write for complete details.



Cures and Protects at one low cost.



Manufacturers of SISALKRAFT, FIBREEN, SISALATION, SISALTAPE AND COPPER-ARMORED SISALKRAFT

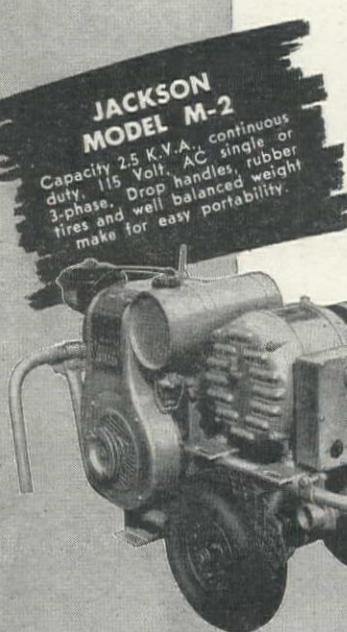
Continuous DAY IN and DAY OUT Dependability

SUCH AS NO PORTABLE POWER PLANTS EVER BEFORE POSSESSED



JACKSON
MODEL M-1

Capacity 1.25 K.V.A. continuous duty, 115 Volt, AC single or 3-phase. Compact, highly portable.

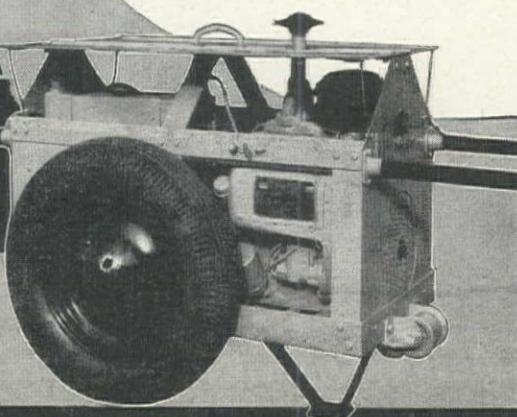


JACKSON
MODEL M-2

Capacity 2.5 K.V.A., continuous duty, 115 Volt, AC single or 3-phase. Drop handles, rubber tires and well balanced weight make for easy portability.

You'll save yourself a wad of dough if the new Portable Power Plant you buy is one of the new JACKSONS. For these plants completely eliminate the time commonly lost when generator troubles arise. A gang held up for 15 minutes while a generator is adjusted or a brush replaced, in the aggregate means hours and dollars lost.

Each JACKSON Plant has a new type, permanent magnet generator which requires no adjustment, no maintenance; is practically trouble-proof. And they deliver full rated capacity in single phase as well as 3 phase, 115 Volt, A.C. power. Add to this the fact that they incorporate the most reliable of engines and quality construction throughout and you have DEPENDABILITY such as no other Power Plant has ever possessed — the finest possible source of power for operating Floodlights, a wide range of power tools, concrete vibrators and vibratory screeds. Get the facts. Write NOW!



JACKSON
MODEL M-4

Capacity 5 K.V.A., continuous duty, 7.5 K.V.A. intermittent duty, 115 Volt, AC single or 3-phase. 4 telescoping handles, standard auto tires and well balanced weight. Provide unusual maneuverability for a plant of this size.

ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Mich.

KING CO.—W. G. Clark, 408 Aurora Ave., Seattle—\$40,000 for 1-story, stucco, bowling alley bldg., Juneau St. and Empire Way, Seattle—by L. I. LeMay, Seattle. 2-28

SPOKANE CO.—Central Construction Co., Spokane—\$100,000 for food market, Main and Post Sts., Spokane—by Albert Arend, A. & K. Markets, Spokane. 1-28

WHATCOM CO.—Austin Co., Dexter Horton Bldg., Seattle—\$150,000 for quick-freezing and storage plant, Lynden—by Baker Cold Storage Co., Seattle. 2-9

Territories

HAWAII—John F. Nickols, Honolulu—\$124,387 for relocation and construction of Honolulu Magnetic Observatory—by Bureau of Yards and Docks, Washington, D.C. 3-4

Canada

BRITISH COLUMBIA—Bennett & White Construction Co., Ltd., 510 W. Hastings St., Vancouver—\$205,330 for 1-story, reinf. conc. furniture warehouse, 2nd Ave. and Clark Dr., Vancouver—by McLennan, McFeely & Prior, Ltd., Vancouver. 2-16

BRITISH COLUMBIA—B. C. Bridge and Dredging Co., Ltd., Vancouver—\$5,000,000 for pulp and paper plant, Port Alberni—by Bloedel, Stewart and Welch, Vancouver. 2-16

Miscellaneous...

Arizona

MARICOPA CO.—C. R. Edmonds, Phoenix—\$60,000 for softball park, W. of present park at 17th Ave. and Roosevelt St., Phoenix—by Art Funk and Ben Spalding, Jr., Phoenix. 2-24

MOHAVE CO.—Chas. J. Dorfman, 124 N. La Brea Ave., Los Angeles—\$214,251 for streets, hwys., sidewalks, curbs, gutters, drainage facilities, sewage and water system, Davis Dam project—by Bureau of Reclamation, Denver. 2-27

California

SAN DIEGO CO.—Fishbach & Moore, Inc., 1509 W. 8th St., Los Angeles—\$872,000, for additions and alterations to existing station electrical distribution system, plus new facilities to piers 10—13, San Diego—by U. S. Navy, Public Works Office, San Diego. 2-27

Oregon

KLAMATH CO.—Henry George & Sons, 425-6 Hutton Bldg., Spokane, Wash.—\$398,813 for 500,000-bushel grain elevator at Worden—Tulana Farms Co., Portland. 2-16

Texas

DALLAS CO.—Dolph Construction Co., Thomas Bldg., Dallas—\$58,000 for construction of swimming pool, filter plant, bath house, etc., at Grand Prairie—by City Council, Grand Prairie. 1-29

Washington

DOUGLAS CO.—Cascade Contractors, Inc., 1200 W. Ewing, Seattle—\$408,034 for construction of 420 mi. transmission line and rural electric distribution system—by

Douglas Co., Public Utilities District No. 1, 1-31
Waterville.

KING CO.—Raymond Concrete Pile Co., 816 W. 5th St., Los Angeles, Calif.—installation of piling foundations for \$750,000 motor plant, Fourth Ave. S., Seattle—by Ford Motor Co., Detroit, Mich. 2-16

LEWIS AND THURSTON COS.—Morrison-Knudsen Co., Inc., Hoge Bldg., Seattle—\$136,070 for clearing 30 mi. right-of-way for Chehalis-Olympia 230-kv. transmission line—by Bonneville Power Admin., Portland, Ore. 2-25

Canada

BRITISH COLUMBIA—Campbell Contracting Co., Ltd., Vancouver—\$46,000 for clearing right-of-way betw. Port Alberni and Dunsmuir for 14-mi. high tension line—by British Columbia Power Commission, Vancouver. 3-2

BRITISH COLUMBIA—General Construction Co., Ltd., Vancouver—\$1,294,945 for power house, storage tank, and other const. work, Campbell river development, Vancouver Island—by B. C. Power Commission, Vancouver. 3-16

PROPOSED PROJECTS

Water Supply ...

California

FRESNO, KERN AND TULARE COS.—Corp of Engineers will construct flood control projects: Isabella reservoir on Kern river, capacity 550,000 ac. ft., \$9,080,000; Terminous reservoir on Tule river, capacity 50,000 ac. ft., \$7,662,000; Success reservoir on Tule river, capacity 50,000 ac. ft., \$7,115,000; and Pine Flat reservoir on Kings river, capacity 1,000,000 ac. ft., \$21,945,000. All part of \$450,000,000 federal program.

Dam ...

Texas

HOOD & PARKER COS.—The Brazos River Conservation & Reclamation District is planning a 210,000-ac. ft. storage dam and 20,000 kw. power plant, costing \$4,420,000.

Building ...

California

SAN FRANCISCO CO.—State of California will build a new \$5,000,000 campus on a 60-ac. tract, 19th Ave. and Holloway St., near Lake Merced, San Francisco, for San Francisco State College. Plans have been completed by Architect Robt. D. Murray.

Texas

DALLAS CO.—U. S. Govt., Veterans'

March, 1946—WESTERN CONSTRUCTION NEWS

Administration, plans a new \$3,000,000, 500-bed hospital on ground owned by Southern Medical Foundation.

LUBBOCK CO.—Lubbock Memorial Hospital plans 11-story and basement hospital bldg. of brick, stone and reinf. conc., 200 rooms, costing \$1,000,000.

Washington

KING CO.—Frederick & Nelson of Seattle, a division of Marshall Field & Co., are planning a \$5,000,000 expansion and modernization of their department store. Contracts are about to be let for the first two million dollar phase of the program.

SKAGIT CO.—Northern State Hospital of Sedro-Woolley is planning new hospital bldgs. at an estimated cost of \$2,500,000, including recreational hall, commissary additions, men's wards, women's wards, ball

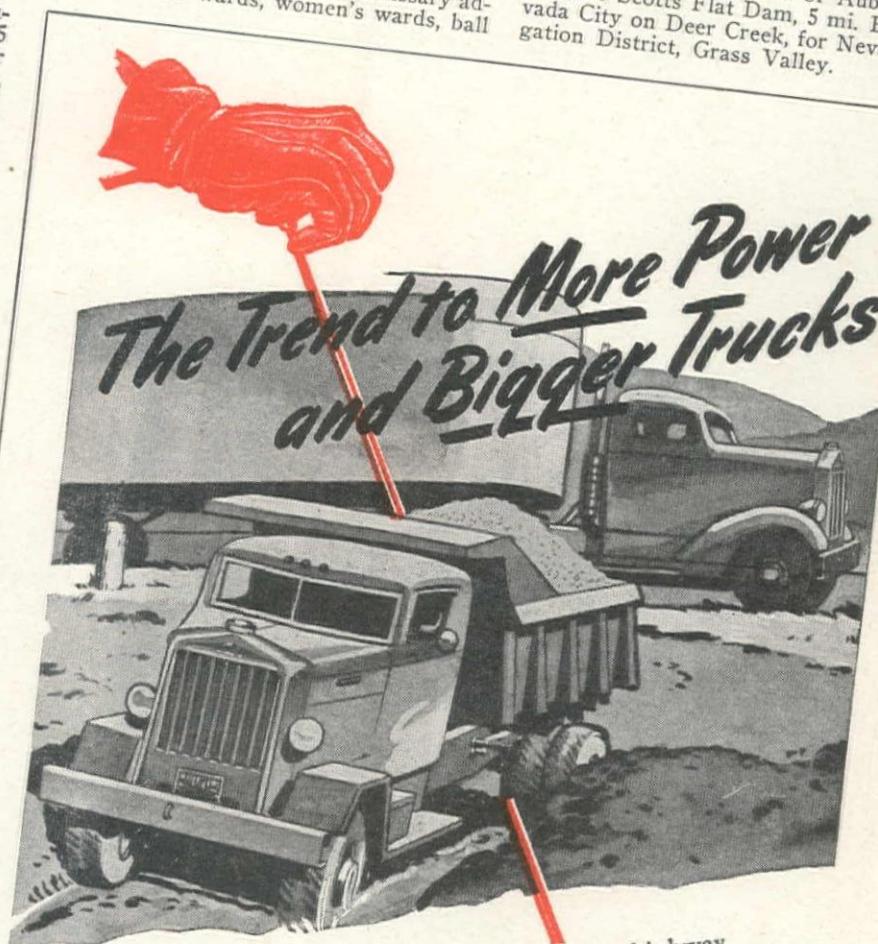
field, 12 cottages, employees' cottages, dining room, kitchen and freezing system.

SPOKANE CO.—James Crick of Spokane plans to start construction on \$500,000 Crick medical center, 8th, 9th and McClellan Sts., Spokane, with offices for 50 doctors and dentists.

Irrigation ...

California

NEVADA CO.—Consulting Engineers Blackie and Wood, 544 Market St., San Francisco, have completed plans for a \$71,000 canal 5 mi. NE. of Grass Valley, a \$90,000 canal 6 mi. NE. of Auburn, and \$300,000 Scotts Flat Dam, 5 mi. E. of Nevada City on Deer Creek, for Nevada Irrigation District, Grass Valley.



In both over-the-highway and off-the-highway service, the trend is to larger units to assure increased payloads at easily maintained, high average road speeds. The Fuller Model 5A920 is the *only* automotive transmission which is designed to handle these big new engines in the extra-tough operations... and which has proved itself in service. Here's another example of why alert truck owners specify Fuller Transmissions.

FULLER MANUFACTURING COMPANY, TRANSMISSION DIVISION
KALAMAZOO 13F, MICHIGAN

Unit Drop Forge Division, Milwaukee 7, Wisconsin



TRADE WINDS

News of Men Who Sell to the Construction West

NEARLY 1500 DISTRIBUTORS and manufacturers turned out for the 27th annual convention of Associated Equipment Distributors, January 28-31, at the Edgewater Beach Hotel in Chicago, Ill., where F. B. McBath of the Columbia Equipment Co., Portland, Ore., was elected A.E.D. president for 1946.

Even though convention attendance was limited to members only, it exceeded by 500 that of years when all members of industry were invited. McBath called the unprecedented number at the convention "proof that the industry is ready to undertake the greatest heavy construction program in history if we can get the materials and the labor."

Tragedy struck on the convention's closing day when retiring president Hamilton O. Penn, of H. O. Penn Machinery Co., N. Y., died suddenly of coronary thrombosis in his hotel suite. "Ham," as he was known throughout the industry, was recognized as one of the world's largest distributors. During the war, he was chief of the Used Construction Machinery and Track Type Tractor Sections of the War Production Board, where he originated the order for inventory and control of about a billion dollars worth of used construction equipment, more than \$350,000,000 of which has been absorbed into war needs.

President Harry Truman telegraphed Penn at the convention's start, "I am happy to greet you and members of the Associated Equipment Distributors on the occasion of the 27th annual convention. I know that you are aware of the important part that manufacturers and distributors of machinery must play in the program of the construction industry and of the reliance that we have in your determination and ability to do everything possible to lower

construction costs and to aid the construction program in every way."

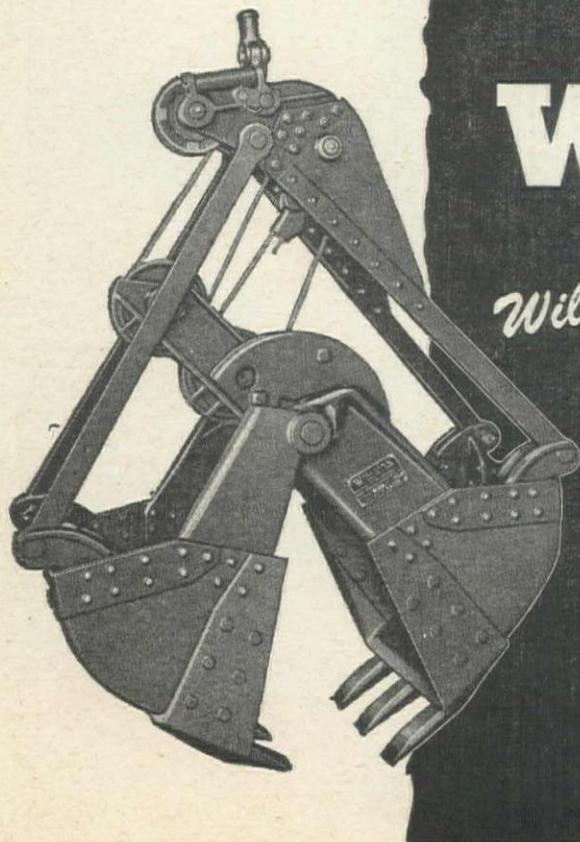
Principal speakers at the convention were Harry A. Dick, president of Gilpin Construction Co., Portland, Ore., and president of Associated General Contractors of America, Inc.; Oregon's Senator Wayne L. Morse; A. F. Garlinghouse, of Garlinghouse Bros., Inc., Los Angeles, Calif.; P. B. Reingold, of Atlas Equipment Corp., Pittsburgh, Pa.; Architect G. R. Magney; Publisher A. E. Paxton; Henry Hale, Milton-Hale Machinery Co., Albany, N. Y.; J. T. Calloway, of Goodyear Tire & Rubber Co., and president of Manufacturers' Division of American Road Builders' Assoc.; G. M. Just, of International Harvester Co., Chicago, Ill.; Carol F. Winchester, A.E.D. executive secretary; Lachlan MacLeay, president of Mississippi Valley Assoc.; Henry Miller of the Federal Trade Commission; George W. Gagel, of Machinery & Supplies Co., Kansas City, Mo.; John H. Gorman, Tractors, Inc., Providence,



H. O. PENN (left) congratulates F. B. McBATH (right), newly-elected president of A.E.D. Penn, outgoing president, died on the A.E.D. convention's closing day.

R. I.; George H. McKean of U. S. Maritime Commission; Col. John S. Cooke, vice president of War Assets Corp., and Lt. Com. John Davis Lodge, U.S.N., retired.

President McBath told his audience of distributors and manufacturers from all over the U. S., as well as Canada, Puerto



The Quality Line! **WELLMAN** *Williams Type* **BUCKETS**

• You get longer service with less maintenance when you use Wellman Williams buckets because this quality line pioneered the field in welded construction of high-grade rolled steel. *Wellman-built means better-built!*

SEND FOR BULLETIN

THE WELLMAN ENGINEERING COMPANY
7028 CENTRAL AVENUE CLEVELAND 4, OHIO
DISTRIBUTED BY: Coast Equipment Co., San Francisco • Loggers & Contractors Machinery Co., Portland • Pacific Hoist & Derrick Co., Seattle • Cate Equipment Co., Salt Lake City • Construction Equipment Co., Spokane

Rico, London and Honolulu, that nationwide strikes are "killing the goose that laid the golden egg" and deplored "the growing loss of the public's confidence in their elected and appointed public officials, and the damage to the national morale growing out of bitter, long-continued class conflict."

Other new A.E.D. officers are: William A. Danner, Parker Danner Co., Hyde Park, Mass., executive vice president; A. F. Garlinghouse, of Los Angeles, vice president; C. F. Halladay, Western Material Co., Sioux Falls, S. D., vice president; Walter J. Kane, Kane-Gibb-Marr Co., Winnipeg, Can., vice president; W. W. Bucher, R. E. Brooks Co., N. Y., treasurer, and Carol F. Winchester, Washington, D. C., executive secretary.

Western A.E.D. regional directors for 1946 are: Region 8, C. F. Halladay, of Sioux Falls, S. D.; Region 10, H. L. Burleson, Browning-Ferris Machinery Co., Dallas, Tex.; Region 11, A. F. Garlinghouse, of Los Angeles; Region 12, Frank G. Connelly, Connelly Machinery Co., Billings, Mont.; and in Region 14, W. A. Norris, Wortham Machinery Co., Cheyenne, Wyo.

★ ★ ★

CALIFORNIA

PIONEER RUBBER MILLS, San Francisco, with a factory in Pittsburg, Calif., has been awarded a Navy certificate of achievement in recognition of the excellent work it performed in production of industrial rubber goods, including fire hose, during the war. The hose was used on all types of Navy installations and ships. The certificate was signed by H. Struve Hensel, Assistant Secretary of the Navy.

★ ★ ★

VICTOR EQUIPMENT CO., San Francisco, has opened a new retail sales store for their gas and electric welding apparatus and supplies. It adjoins their main office and plant at 844 Folsom St., San Francisco, and provides over 10,000



OPENING DAY decorations at the new retail sales store of Victor Equipment Co.

sq. ft. of additional floor space. Quarters for the company's technical publications and advertising department are on the second floor and a modern research and testing laboratory will occupy the third floor.

★ ★ ★

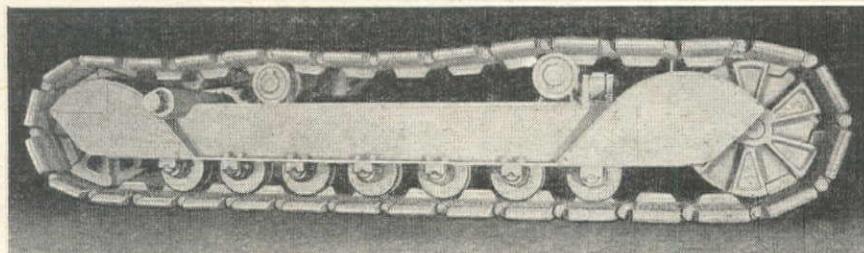
SMITH BOOTH USHER CO., Los Angeles, announces the appointment of three new sales engineers. They are Lynn G. Lawrence, R. W. Bachman and E. F. Hainley. They will devote all their time to outside work in the construction field of Southern California and Nevada. At the same time, the appointment of N. E. Pierce and A. W. Chaffee to the inside sales staff of the firm was announced.



Shovel Type Shoes

• Crawler shoes on the Parsons 250 Trenchliner, and on the other Parsons Trenchliners, are the same rugged, long lasting, trouble-free type used on Heavy-Duty power shovels and cranes. Each individual shoe is strong enough to carry the whole weight of the Trenchliner. Self-cleaning because their streamlined shape sheds dirt. Crawler belts are 18" wide, 9' long center to center, provide low ground pressure — only 7 lbs. per square inch. That's why this 26,000 lb. Trenchliner keeps its smooth mobility even on soft ground.

PARSONS 250 TRENCHLINER



WRITE FOR YOUR CATALOG TODAY!

PARSONS COMPANY

KOEHRING SUBSIDIARY NEWTON, IOWA

TRENCHING EQUIPMENT



A. M. Kivari and **Earl M. Kelly** have recently organized a new company known as **PROCESS ENGINEERS, INC.**, with offices located at 6381 Hollywood Blvd., Los Angeles, and are representing on the Pacific Coast the **LINK-BELT CO.**, **INFILCO, INC.**, **PACIFIC FLUSH TANK CO.** and **COOPER-BESSEMER CORP.** in the water, sewage and industrial waste treatment field.

☆ ☆ ☆

Alexander H. Gaal has been appointed merchandising manager for the **EARLE M. JORGENSEN CO.**, steel distributors, with warehouses in Los Angeles, Oakland, and Houston, Tex. For the past three years he has been in the Steel Division of the War Production Board at Washington, D. C., and prior to that represented the **REPUBLIC STEEL CORP.** in Los Angeles.



Construction and industrial equipment users in the Southwest will be interested to know that the sales and service firm of **FORNACIARI CO.** has moved to new and larger headquarters at 821 S. Santa Fe Ave., Los Angeles, as announced by

Bert B. Fornaciari,

a partner, who founded the firm in 1929.

Feeling that customers are better served by the most complete parts and service facilities, this specialization is the keynote of the firm. The products of the **BARCO MANUFACTURING CO.**, makers of the gasoline hammers and ball and swivel joints and the **BUDA COMPANY'S** earth drills,

Diesel nozzle testers, industrial "Chore Boy" shop trucks, lifting jacks and railway equipment are distributed by the company with the most complete stock, parts and servicing facilities for these products on the West Coast. An addition to their operations is a complete jack-servicing shop covering hydraulic and mechanical jacks complete for the Buda line and also including many of the more popular models of other makes.

Servicing facilities are in charge of **K. F. (Andy) Andrews**, who has been with the firm for fifteen years, assisted by **H. Beitz** and **E. Hugill**. **H. F. Farenbruck** is office manager. The sales department is headed by **Paul Fornaciari**, a partner in the firm, who is assisted by **J. Walter Harbison**, who has been associated with Southern California sales organizations for a number of years.

☆ ☆ ☆

The **ACE MANUFACTURING & SUPPLY CO.** announced the purchase of the business and plant of **KUSBER BROS. & PAGE** and will engage in machine shop fabricating, tool and die making, and manufacture and repair of road machinery and construction equipment. **Clarence Page** is president of the San Francisco firm.

☆ ☆ ☆

David E. Day, vice president in charge of manufacturing for the **RICHFIELD OIL CORP.**, has been named a director of the **BOARD OF THE COORDINATING RESEARCH COUNCIL**. The council is comprised of six leading engineering and research executives drawn from the oil industry and six similar top men from the automotive industry. Day will represent the Pacific Coast on the council. He fills the vacancy caused by the resignation of **Ralph Halloran**, president of the California Research Corp., the only other Westerner ever to serve as a director of the council.

☆ ☆ ☆

THE BOWIE SWITCH CO., a pioneer San Francisco firm, manufacturing pole line equipment and maintenance tools, has been acquired by the **A. B. CHANCE CO.** of Centralia, Mo. **J. T. Isbell** has been appointed vice president and Pacific Coast manager, and **J. R. Martin**, Pacific Coast plant manager.

☆ ☆ ☆



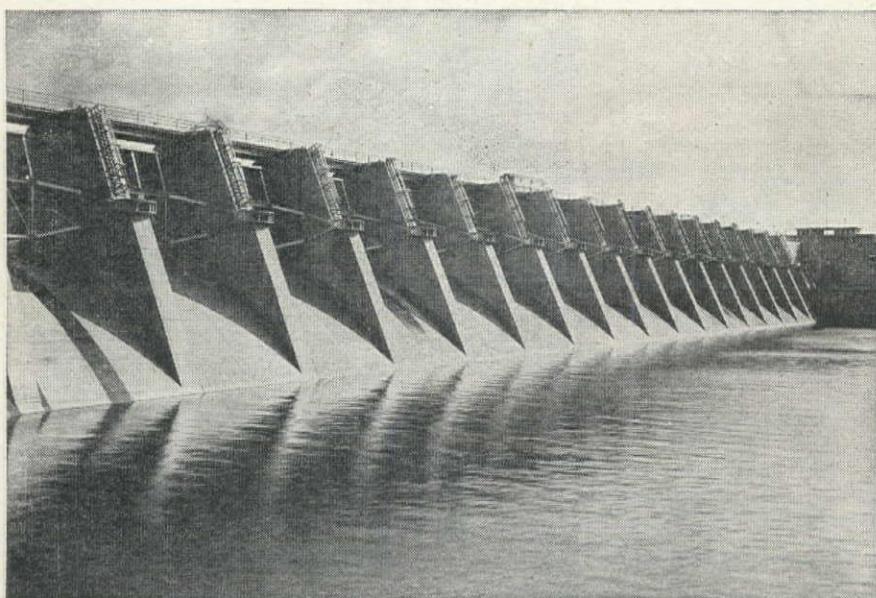
Paul Fenwick has been announced as district manager for **LIMA LOCOMOTIVE WORKS, INC.**, shovel and crane division, in the states of California, Arizona and Nevada. He is retiring from the Army as a lieutenant colonel, after more than four years of service in the Transportation Corps.

☆ ☆ ☆

Harvey A. Craig has been appointed Pacific Coast manager for **REPUBLIC STEEL CORP.**, supervising the territory of all three Coast sales offices, but will also retain his position as manager of the Los Angeles office. **W. L. Thoma** will continue as district manager in San Francisco, and **C. B. Gardner** in Seattle.

☆ ☆ ☆

E. C. Auld has been announced as manager of the Air Compressor division of the **JAEGER MACHINE CO.** for Southern



Spillway of the TVA's Watts Bar Dam near Chattanooga, Tenn.

FIR-TEX **ABSORPTIVE FORM LINER** *Produces Smoother, Harder Concrete on* **WATTS BAR - TVA DAM**

FIR-TEX Absorptive Concrete Form Liner is a highly absorptive felted board, with a chemically treated surface which resists bonding. The mechanical vibration of concrete increases the tendency of air and water bubbles to float to the surface and to the face of the mass. When a non-absorptive form liner is employed, these bubbles have no avenue of escape and consequently remain to become voids in the face of the concrete.

The action of the Fir-Tex Liner is like that of a vacuum cleaner. It absorbs all excess air and water adjacent to surface. The removal of bubbles permits the cement to flow into those spaces so that this surface sets solidly into a smooth attractively textured mass of extreme density and resistance to moisture. This structural change in the concrete extends to a depth of about $1\frac{1}{4}$ inches from the face. Not only has the structure been given architectural beauty, but its weather resistance has been so greatly increased that eminent engineers have referred to its surface as "case hardened."

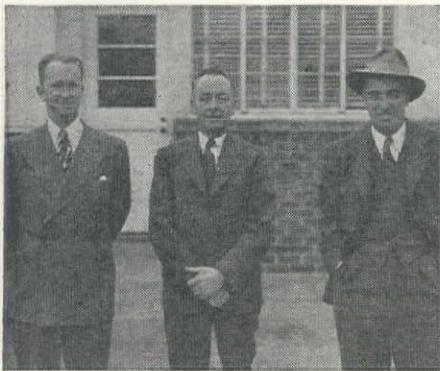
FIR-TEX INSULATING BOARD CO.

Porter Building, Portland 4, Oregon

California and Arizona. His headquarters will be with SMITH BOOTH USHER CO. in Los Angeles. He is well known among contractors and engineers of the territory, having had many years of experience as a sales engineer in the area.

☆ ☆ ☆

A new construction equipment firm known as GOLDEN STATE EQUIPMENT CO. has been established at 4770 Valley Blvd., Los Angeles. It will be the exclusive distributor in Southern California for WORTHINGTON PUMP & MA-



MARK GRAY, W. L. McGONIGLE and DAN FOLEY, partners in the newly-organized Golden State Equipment Co., Los Angeles, Calif.

CHINERY CORP. and RANSOME CONCRETE MACHINERY CO. The three owners of the new company are Mark Gray, Pres., W. L. McGonigle, Vice Pres., and Dan Foley, Treas. All three were formerly associated with SMITH BOOTH USHER CO.

☆ ☆ ☆

R. W. Fitzgerald, formerly manager of the Detroit district of GOODYEAR TIRE & RUBBER CO., has been named Western Division Manager, with headquarters in Los Angeles. He succeeds E. L. Mefford, who died last month. At the same time, M. C. McAlonan, manager of the Oklahoma City district, succeeds Fitzgerald at Detroit, and R. G. Miller, manager of the Peoria district, moves to Oklahoma City.

☆ ☆ ☆

Major Kenneth S. Butler is resuming his former position as San Francisco district manager for B. F. McDONALD CO., after three years of active military service. He is widely known in safety circles, having been formerly with the U. S. Bureau of Mines.

☆ ☆ ☆



INTERMOUNTAIN

Sales offices are being established by STEEL CONVERSION CORP. of Sparks, Nev., in the Petroleum Building in Los Angeles, under the direction of James P. Walsh, and an export office at 690 Market St., San Francisco, will be supervised by I. R. Whiteman.

☆ ☆ ☆

The Salt Lake City trading area has been added to the territory of R. M. Alword, commercial vice president of the GENERAL ELECTRIC CO. in San

Francisco; the trading area of Butte, Mont., has been added to A. S. Moody, commercial vice president in Portland, Ore.; and the Denver, Colo., area has been assigned to W. B. Clayton, commercial vice president at Dallas, Tex. These reassessments are made to cover the retirement of A. L. Jones, commercial vice president in Denver, who retired recently after 41 years in service.

☆ ☆ ☆

James H. Tiller, Jr., formerly district manager for BARBER-GREENE CO. and more recently a colonel in the Corps of Engineers, has been appointed manager of the Phoenix, Ariz., office of the BROWN-BEVIS EQUIPMENT CO. He retires from the Army after fifty-two months of service, most of it at Ft. Sam Houston, Tex., where he was in charge of operation and maintenance of equipment.

J. K. Wheeler, for the past 20 years associated with H. D. LANDES in the sales and service of heavy duty construction equipment in the Intermountain region, has established his own company at 171 W. South Temple St., Salt Lake City. The new firm, known as J. K. WHEELER MACHINERY CO., will handle the equipment of R. G. LETOURNEAU, INC., LINK-BELT SPEEDER CORP., WORTHINGTON PUMP & MACHINERY CO., RANSOME MACHINERY CO. and CLEVELAND TRENCHER CO.

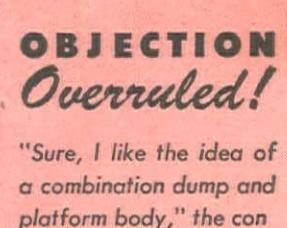


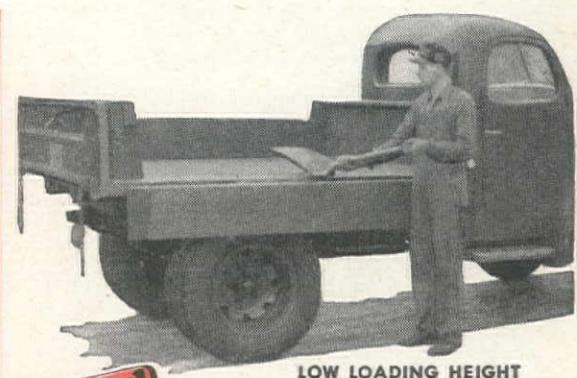


**OBJECTION
Overruled!**

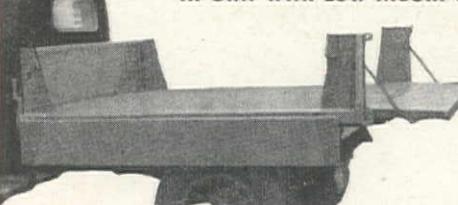
"Sure, I like the idea of a combination dump and platform body," the contractor said. "But I object to the time killing business of lifting out sides or hammering out pins so the sides can drop!"

"You be the judge," we countered. "St. Paul's DS Body has exclusive one man 'lever locking'. . . . Dropping the sides is as simple as opening a door! It's a natural for hand loading or shoveling and ideal for cleaning up at the completion of a job."



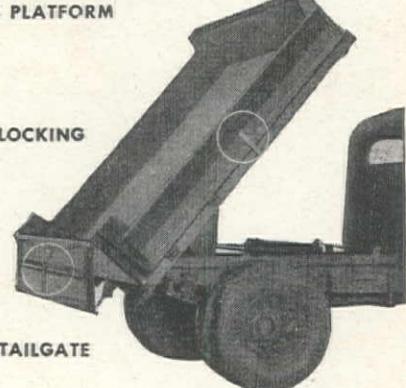


St. Paul HYDRAULIC
DROP SIDE BODY
in Unit with Low Mount Hoist



DS BODY AS PLATFORM

HAND LOCKING LEVERS



DOUBLE ACTING TAILGATE

ST. PAUL HYDRAULIC HOIST COMPANY
2207 University Avenue S.E. • Minneapolis 14, Minnesota

DISTRIBUTED BY

SORENSEN EQUIPMENT COMPANY
4430 East 12th St. • Oakland 1, California

The new office and warehouse of NEIL B. McGINNIS CO., Phoenix, Ariz., distributors of construction and farm machinery, is now occupied by the company, and its expanded facilities offer first-class sales and service opportunities to Arizona contractors. The building is located at 500 S. Central Ave., Phoenix, and is a 100 x 162-ft.



SALES AND DISPLAY room of the new building of Neil B. McGinnis Co., Phoenix, Arizona. The plant is completely equipped for sales and service of nationally-known equipment.

reinforced concrete frame structure with brick-filled walls and timber truss roof. Offices are located on the mezzanine floor. The shop measures 60 x 100 ft., and the display room 60 x 85 ft. The photograph shows the display room on the day of the opening of the new headquarters to business.

★ ★ ★

A new plant is being built at Sparks,

Nev., by the STEEL CONVERSION CORP. and will be under the supervision of G. A. Duemling. It will manufacture a complete line of demolition tools for mines, railroads and all general industrial construction. It is the first plant of its kind in the West to specialize in this type of manufacturing and also the first of its kind in the country to be completely operated by electricity. A pilot plant previously erected at Las Vegas will be included in the Sparks factory, and operations will begin within ninety days. David J. Catrow is chief engineer.

★ ★ ★

Recent changes in branch management of the Motor Truck division of INTERNATIONAL HARVESTER CO. include the promotion of T. R. Moulder from assistant manager to manager of the new San Antonio, Tex., branch, and a similar advancement of C. T. Hellin at the Houston, Tex., branch. E. M. Moore has been appointed assistant to Hellin at Houston. C. B. Ellis has been transferred from the position of assistant manager at Topeka, Kans., to a similar position in Kansas City.

★ ★ ★

PACIFIC NORTHWEST

NATIONAL ELECTRIC PRODUCTS CORP., Pittsburgh, Pa., has established a new sales territory in the state of Oregon and appointed J. Harley Sroufe, for the past three years manager of the company's Seattle office, to be in charge. N. L. Bost has returned to Seattle from military leave.

★ ★ ★

Cmdr. E. C. Van Horn has been appointed manager of the enlarged service parts

department of KENWORTH MOTOR TRUCK CORP., Seattle, Wash. He was one of the original employees of Kenworth, and during the war had charge of the construction and establishment of a complete ship repair shop at the U. S. Naval Station in Seattle.

★ ★ ★

The Iron and Steel Division of KAISER CO., INC., announces the opening of a new Northwest district sales office at 307 Hoge Bldg., Seattle, to complement the existing sales facilities at Portland. Jack Carlson has been named Seattle District sales manager. He was previously affiliated with Inland Steel Co.

★ ★ ★

AMONG THE MANUFACTURERS

Lt. Chester Abbey has been appointed research engineer of GYPSUM ASSN. and according to John C. Best, president, will initiate a comprehensive expansion of the research program of the gypsum industry. It is anticipated that gypsum will play an increasingly important role in the forthcoming construction boom, and important studies in fire safety, weather resistance, structural strength and other factors will be undertaken.

★ ★ ★

J. W. Patrick, Jr., has been appointed manager of warehouses for FOLLANS-BEE STEEL CORP. of Pittsburgh, Pa. The corporation plans to broaden its field of service and expects to open new warehouses in localities not previously covered. Patrick was formerly manager of the Philadelphia branch of PETER A. FRASSE CO., INC.

CONTACT YOUR GALION DISTRIBUTOR FOR THE RIGHT HOIST and BODY FOR YOUR WORK

WELCH MANUFACTURING CO.
533 W. Jefferson St., Phoenix, Ariz.

JUMBO EQUIPMENT CO.
1012 S. Los Angeles St.
Los Angeles, Calif.

F. A. B. MANUFACTURING CO., INC.
67th & Vallejo Sts., Oakland 8, Calif.

IRA JORGENSEN
High & Ferry Sts., Salem, Oregon

NEWELL TRUCK EQUIPMENT CO.
316 Russell St., Portland, Oregon

BEALL PIPE & TANK CORPORATION
1945 N. Columbia Blvd., Portland 3
Oregon

TRUCK WELDING CO., INC.
739-9th Ave., N., Seattle, Wash.

WASHINGTON MACHY. & SUPPLY CO.
Division St., O.W.R. & N.
Spokane, Wash.

MIDLAND IMPLEMENT CO.
Great Falls, Montana

MIDLAND IMPLEMENT CO.
2301 Montana Ave., Billings, Mont.

WILLIAMSON AUTO BODY CO.
2048 Washington Blvd., Ogden, Utah

WILLOCK TRUCK EQUIPMENT CO.
1378 W. Broadway, Vancouver, B. C.
Canada

GALION, OHIO

THE GALION ALLSTEEL BODY CO. *

Gorman-Rupp pumps represent years of specialized engineering study of contractor's pumping problems. They will pump as much, or more, water for more continuous hours without a stop and at less maintenance cost than any other pump on the market. A reliable pump for every purpose.

DISTRIBUTORS

Pacific Hoist & Derrick Co., Seattle, Wash.; Andrews Equipment Service, Portland, Ore.; Western Construction Equipment Co., Billings and Missoula, Mont.; The Sawtooth Company, Boise, Idaho; The Lang Co., Salt Lake City, Utah; Horron, Rickard & McCone Co., of Southern California, Los Angeles; Francis Wagner Co., El Paso, Texas; Neil B. McGinnis Co., Phoenix, Ariz.; Lomen Equipment Co., Inc., (Alaska Distributor exclusively), 327 Coleman Bldg., Seattle, Wash.; Allied Construction Equipment Co., Reno, Nevada; Wertham Machinery Co., Cheyenne, Wyoming.

 THE GORMAN-RUPP COMPANY
MANSFIELD • OHIO



Fifty-seven exclusive distributors for the equipment of R. G. LeTOURNEAU, INC., have been announced, thus completing the domestic sales organization of the company. This sales structure was established in less than two years, and is divided into three divisions: eastern, central and western. Specialized employees of each distributor have been trained for their work in LeTourneau schools.

☆ ☆ ☆

Four new directors of development in the engineering division of CARRIER CORP. have been announced. They are Sam F. Shawhan, air conditioning development; R. Wayne McLaughlin, centrifugal refrigeration development; J. Lorin Fletcher, package units development; and Lars Hanson, reciprocating refrigeration development.

☆ ☆ ☆

A. T. Marchuk has been appointed production manager of ATHEY PRODUCTS CORP. of Chicago. He has been with the company since 1936, most recently in the capacity of comptroller of sales and production schedules.

☆ ☆ ☆

J. A. O'Brien, a vice president of JOHNS-MANVILLE SALES CORP., has been appointed manager of the power products and industrial department of the parent company. H. R. Berlin has been elected a vice president of the sales corporation and manager of the building materials and general department of the main company. C. G. Dandrow has also been elected a vice president of the sales corporation and simultaneously made general manager of the power products and industrial department.

☆ ☆ ☆

Lt. Robert Maynard has returned to his position as export manager for the OSGOOD COMPANY, manufacturers of Osgood and General Excavator shovels, cranes, draglines and similar equipment. He was recently discharged from the Navy after serving three years in the Pacific theater of war.

☆ ☆ ☆

Organization changes at the SMITH ENGINEERING WORKS, Milwaukee, Wis., include: the return of Gerald L. Smith from the Navy and his appointment as vice president in charge of sales; H. H. Schaper will continue in the position of assistant sales manager, and Donald D. Barnes, formerly executive vice president and sales manager, will continue as executive vice president. The company manufactures gravel plants and Telsmith equipment for mines and quarries.

☆ ☆ ☆

A consolidation of the executive and sales offices and production facilities of BROOKS EQUIPMENT CORP. has been announced and the new headquarters established at Hoboken, N. J. The company, which manufactures flexible equipment, needed much larger quarters for its



it's all the same to ARMCO culverts

The strength given ARMCO culverts by corrugated iron construction makes possible installation by a wider variety of methods than is practicable with any other type of culvert. No matter what the installation problem, ARMCO culverts can be placed quickly and economically. High resistance to impact and great load bearing strength under either vertical or horizontal stress minimizes time loss from protective measures during installation.

ARMCO culverts can be filled over as soon as in place and roadways opened to traffic immediately.

Quick field joining methods, long service life, and low maintenance costs all contribute to the economy gained by installing ARMCO culverts.

**We offer a complete line of drainage equipment
Our staff of engineers is always available to help
you solve your drainage problem.**

calco

1399

CALIFORNIA CORRUGATED CULVERT COMPANY
BERKELEY 2 LOS ANGELES 12

ARMCO DRAINAGE & METAL PRODUCTS, Inc., Hardesty Division
Plants now operating: DENVER; SALT LAKE CITY; BOISE, TWIN FALLS, CALDWELL, IDAHO; ONTARIO, ORE.

WASHINGTON CULVERT AND PIPE COMPANY
PLANTS AT SEATTLE AND SPOKANE • GENERAL OFFICE: 3441 IOWA AVE., SEATTLE 6

OREGON CULVERT AND PIPE COMPANY
2321 S. E. GLADSTONE STREET, PORTLAND 2

expanded postwar program, and the consolidation will eliminate much lost motion.

☆ ☆ ☆

INTERNATIONAL NICKEL CO., INC., announces the opening of the St. Louis Technical Section of its Development and Research Division. The new section will be under the direction of **George A. Fisher, Jr.**, and will furnish technical assistance in the state of Missouri and portions of Illinois, Iowa, Arkansas, Tennessee, Nebraska and Kansas.

☆ ☆ ☆

The annual report of the HERCULES POWDER CO. for 1945 shows net earnings after all charges of \$4,925,800, which is an increase of approximately \$100,000 from the 1944 earnings. Dividends on common stock in 1945 amounted to \$3.36. Net

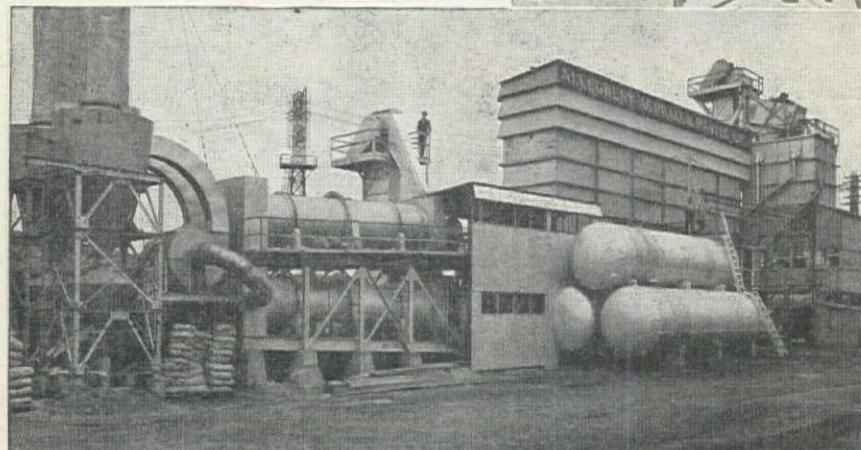
sales for the year amounted to \$100,555,904. Expenditures for research continue at about 3 per cent of net sales. Capital expenditures were the highest in several years, reflecting a desire to get into post-war operation.

☆ ☆ ☆



Following his release from the Naval Air Force, **Eugene T. Scott** has joined TEMPLETON, KENLY & CO., Chicago, manufacturers of Simplex Industrial jacks, as product application engineer, with headquarters in Chicago.

**From the smallest
portable patch plants →
to the largest
stationary models →**



**H & B ASPHALT PLANTS ARE
ENGINEERED AND BUILT TO GIVE TROUBLE-FREE,
ECONOMICAL PERFORMANCE UNDER THE MOST
SEVERE OPERATING CONDITIONS**



Dependable performance—under a wide variety of operating conditions—is engineered and built into every Hetherington & Berner Asphalt Plant. As America's first builders of bituminous mixing machinery, Hetherington & Berner take pride in building equipment that will do a good job and prove a profitable investment for its owner. Every H. & B. plant is completely erected and checked at our factory before shipment.

Now that our war job is over, we are back to normal production of H. & B. plants of all types. Literature on H. & B. portable or stationary plants will be sent on request.

HETHERINGTON & BERNER INC. • 739 KENTUCKY AVE., INDIANAPOLIS 7, IND.

FOR BEST RESULTS — BATCH MIX • HOT MIX

A change in name from the Hi-Way Service Corp. to DROTT MANUFACTURING CORP. is announced by **E. A. Drott, Pres.** The new corporation will more readily identify the company's equipment with the manufacturer. Items manufactured include: bulldozers, shovels, tractor cranes, loaders and town patrols.

☆ ☆ ☆

J. E. Gulick has been named general manager of the tire manufacturing division of THE B. F. GOODRICH COMPANY, succeeding **A. W. Phillips**, resigned. Gulick joined the Goodrich organization in 1927 as a tire development engineer, became Akron tire division production superintendent in 1932 and later tire sales engineer and staff superintendent, and through successive promotions became general superintendent of the De-Icer and Fuel Cell division in 1941. In his new position he will direct all tire manufacturing operations of the company in the United States.

☆ ☆ ☆

At the annual meeting of the AMERICAN HOIST & DERRICK CO., held at the headquarters of the company in St. Paul, Minn., on Jan. 22nd, the following officers were elected to serve for the ensuing year: **Frederic Crosby**, Chairman of Board and Executive Committee; **Harold O. Washburn**, Pres.; **Stanley M. Hunter**, Vice Pres. of Sales; **Donald B. Botkin**, Vice Pres. of Manufacturing; **James B. Bishop**, Secty.-Treas.; and **Robert J. Henry**, Asst. Secty. Directors are: **Donald B. Botkin**, **Pierce Butler, Jr.**, **Frederic Crosby**, **Donald D. Davis**, **Stanley M. Hunter**, **Howard S. Johnson**, **Phillip L. Ray**, **Carl Schabtach**, **Harold O. Washburn**, **Edwin White** and **Jessel S. Whyte**.

☆ ☆ ☆

Lee M. Corless has been made chief engineer of NOVO ENGINE CO., Lansing, Mich. He formerly specialized in experimental work at the General Motors proving grounds near Milford, Mich., and since 1941 has been in the armed services, rising in rank from 1st lieutenant to lieutenant colonel, specializing in transportation engineering.

LT. COL. LEE M. CORLESS



NEW EQUIPMENT

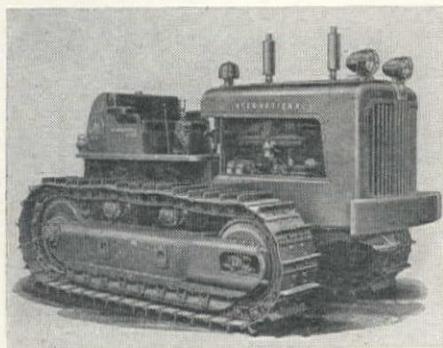
MORE COMPLETE information on any of the new products or equipment briefly described on these pages may be had by sending your request to the Advertising Manager, Western Construction News, 503 Market Street, San Francisco 5, California.

Diesel Crawler

Manufacturer: International Harvester Co., Chicago.

Equipment: Heavy crawler tractor.

Features claimed: TD-24, a new Diesel crawler tractor with 130 drawbar horsepower range, weighs 35,000 lb., the largest tractor ever built by International. The new tractor is designed to insure a high percentage of engine horsepower at the draw-



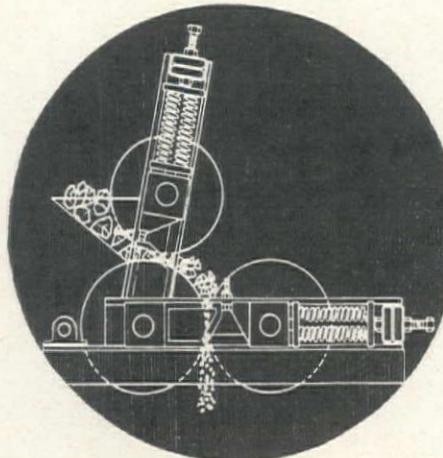
bar. It has 8 speeds, from 1.6 to 7.8 m.p.h. giving great flexibility on all jobs. Additional features are easy steering and positive control, special sealing and anti-friction bearings in track rollers, convenient mounting for all allied equipment, functioning streamlining, and wide comfortable seat with convenient controls.

Triple Roll Crusher

Manufacturer: Pioneer Engineering Works, Minneapolis, Minn.

Equipment: New roll crusher.

Features claimed: New design employing a third roll, each of the three being equipped with manganese steel shells. The



extra roll is mounted over the stationary roll so that the rock is fed into the opening between the top and stationary members and then passes between the stationary and horizontal floating roll. The machine thus actually does the work of two crush-

ers. At present two sizes are available, 54 x 24 in. and 40 x 22 in.

Bar-Lok Clamp

Manufacturer: Mechanics Engineering Co., Jackson, Mich.

Equipment: Shielded C-Clamp.

Features claimed: A C-Clamp with quick-acting Bar-Lok replacing the slow full-threaded locking member; the shoe is pressed firmly against the material to be clamped and the handle turned until the desired pressure is obtained. To release, the handle is turned slightly to the left until the bar is free, after which it may be

slid open to full capacity. In addition the clamp has an optional, detachable shield to protect the holding unit against spatter when the tool is used in connection with welding work.

Flexible Tubing

Manufacturer: Warner Bros. Co., Bridgeport, Conn.

Equipment: Steel core flexible tubing.

Features claimed: Non-collapsible under either plus or minus pressures and retractable to about one-eighth of its extended length, this tubing is suitable for portable or semi-permanent ventilation or other handling of air, gas or light solids. A spring steel helix core causes it to spring out and stay in this position regardless of whether it is being used on suction or pressure. Spiratube fabric is spiral-stitched and the

Performance

... is what counts.
That is why leading
excavators insist
upon the Page
Automatic Bucket
and the Page Walk-
ing Dragline.

PAGE ENGINEERING COMPANY
CHICAGO 38, ILLINOIS

WALKING DRAGLINE • AUTOMATIC BUCKET

inside surface is free of wire ridges. Its weight is considerably less than metal or moulded tubing and it has a bursting strength of 170 psi. Standard diameters are from 3 to 16 in. and lengths from 10 to 25 ft. Couplings are built in.

Vermiculite Building Aggregate

Manufacturer: Alexite Engineering Co., Colorado Springs, Colo.

Equipment: Fireproof, light weight insulating material.

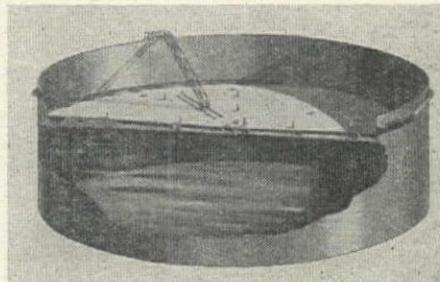
Features claimed: A new deposit of vermiculite near Encampment, Wyoming, the ore of which can be expanded by heating to from 9 to 16 times its original size, has been put into commercial production for plaster and concrete aggregate, fireproofing, insulating and rat-proofing. Vermiculite weighs about one-tenth as much as sand and is therefore favored by plasterers. Vermiculite plaster has four times the insulating value of sand plaster and has been given a 4-hr. fire rating by Underwriters Laboratory.

Floating Roof

Manufacturer: Chicago Bridge & Iron Co., Chicago, Ill.

Equipment: Floating roof for tanks.

Features claimed: An improved floating roof of double-deck construction has been developed for use on flat-bottom tanks,



storing volatile liquids. The double-deck construction insulates the liquid and eliminates practically all boiling, thus extending

the range of products which may be stored. The bottom of the deck is sloped up toward the center and the roof is designed to vent all air. The Horton seal closes the space between the tank shell and roof deck. A ceiling ring forms a long sliding contact with the shell and is joined to the deck by a continuous gas-tight curtain.

Paint Remover

Manufacturer: Kelite Products, Inc., Los Angeles, Calif.

Equipment: Non-inflammable paint remover.

Features claimed: A remarkably fast, non-inflammable paint remover has been made available. It is safe on any metal or hardwood surface, removing as many as eight coats of paint in one step, taking no longer than 30 min. In some tests as many as 22 coats have been removed in 3 steps. Complete removal of one or two coats can be accomplished in 10 min. After penetration paint or enamel is easily sheeted off by a pressure rinse.

Tilting Concrete Mixer

Manufacturer: Muller Machinery Co., Metuchen, N. J.

Equipment: Tilting 3-S mixer.

Features claimed: A new 3-S tilting concrete mixer furnished with either pneumatically tired wheels or steel wheels is



announced. The machine is equipped with a new Briggs-Stratton engine, all-steel drum bowl and a telescoping towing bail. It has a mixing capacity of 3 cu. ft. of mixed concrete.

Wagon Drill

Manufacturer: Worthington Pump & Machinery Corp., Harrison, N. J.

Equipment: Blue Brute wagon drill.

Features claimed: The new UMW-40 wagon drill uses a heavy duty drifter with 4-in. cylinder. It has rifle bar rotation and positive end-seating valve. Added features are, one-piece chucksleeve, positive locking chuck for 1 1/4-in. hollow, round shank drill steel and one air hose to backhead. Heat-treated alloy steel is used in all major parts. The drifter may be easily converted to wet drilling. Strong rotation, low air consumption and high drilling speed give low cost per foot of hole. The wagon mounting has a one-man lifting device, permitting quick adjustment of the drilling unit.

There's More of
Everything You Want
and Need for the
Trenching Job

... in CLEVELANDS

Speed, Mobility and Maneuverability

Power, Strength and Durability

Ease of Handling and Operation

Low Maintenance and Operating Costs

DISTRIBUTED BY: EDWARD R. BACON CO., San Francisco, California—NELSON EQUIPMENT CO., Portland, Oregon—H. W. MOORE EQUIPMENT CO., Denver, Colorado—SMITH BOOTH USHER CO., Los Angeles, California, and Phoenix, Arizona—INDUSTRIAL EQUIPMENT CO., Billings, Montana—J. K. WHEELER MACHINERY, Salt Lake City, Utah.

THE CLEVELAND
TRENCHER CO.

20100 ST. CLAIR AVENUE
CLEVELAND 17, OHIO

CONSTRUCTION PLANT AND EQUIPMENT FROM SHASTA DAM, CALIFORNIA

AVAILABLE FOR SALE

IMMEDIATE DELIVERY

CABLEWAYS AND HOISTS

- 3—Lidgerwood, 3-drum electric hoists with 500 h.p. G. E. motors. Ward Leonard control, complete with controls and all electric equipment.
- 2—Lidgerwood, 3-drum electric hoists with 500 h.p. Westinghouse motors complete with controls and all electrical apparatus.
- 5—Cableway towers, structural steel, 3—125 ft.; 1—75 ft. and 1—45 ft., complete with travel mechanism.
- 6—Complete sets of carriages, main and auxiliary, fall and dump blocks, fall rope carriers, buttons, takeup bars and takeup sheaves.
- 1—American pillar crane, Cap. 5 T. at 48½ ft. and 15 T. at 25 ft. radius.
- 1—Colby elevator hoist, double drum, 75 h.p., equipped with brakes and emergency equipment, including one hoist cage, 15 ton capacity.
- 12,000 lin. ft. of used 3" dia. locked coil cable in length from 500 to 2600 lin. ft.
- Misc. lot of sheaves, jewels, blocks, etc.

CEMENT PLANT

- 1—Dual No. 265 Fuller Fluxo cement pump, duplex type complete with gravity feed and automatic control equipment. 400 bbls. per hr. capacity. Pumping distance 3300 ft.
- 1—Fuller-Kinyon pump—type "D," 125 h.p., complete with air hose power control cable, control cabinet.
- 1—C-200 Fuller single stage rotary compressor Westinghouse motor 100 h.p.

CONVEYORS

- 66—Motor operated gates for sand and gravel up to 6" cobbles with 1-h.p. Allis-Chalmers gear motor.
- 2—Complete sets, including 42" tandem drive pulleys, 42" head pulleys, 36" tail pulleys.
- 3—150 h.p. Westinghouse gear motors, 144 r.p.m., 2300 volts, 3-phase, 60 cycle.
- 1—Airplane tripper for 36" belt with two 17" wing belts, capacity 1,000 T. per hour, complete with pulleys, drives and gear motors.



12—White Dump Trucks Model 1580-691, 24 cu. yd. capacity in good condition.

DRILLING EQUIPMENT

- 2—Mod. 315 I-R portable compressors, gas driven.
- 5—I-R paving breakers.
- 8—I-R drifters DA35.
- 1—I-R-54 drill sharpener.
- 10—I-R jackedhammers.

TANKS AND RECEIVERS

- 10—8 cu. yd. steel hoppers, including gates and air rams.
- 2—Water filters.
- 2—Wallace & Tiernan chlorinators.
- 1—9500 bbl. all welded water tank, 48' dia., 30' high.
- 1—5400 bbl. all welded water tank, 36' dia., 30' high.
- 1—200 bbl. steel water tank.
- 10—Sandblast tanks 24" x 96" with hoppers and fittings.
- 10—Lubricator tanks 14" x 30"; 24" x 48"; and 24" x 60".

PUMPS

- 3—Bingham type SVD submersible pumps.
- 1—Byron-Jackson 150 h.p. 10 in. deep well.
- 2—Byron-Jackson 200 h.p., 5 K-H type 8Q1 deep well turbine pumps.
- 10—I-R No. 25 sump pumps.

MIXING PLANTS

- 1—3000 cu. yd. bin with 5 compartments for aggregates, 2 compartments cement, incl. turnhead, gates.
- 1—Complete set C. S. Johnson fully automatic batching equipment for 5 aggregates, cement and water for 4 cu. batchers.
- 5—4 cu. yd. Koehring concentric zone mixers, including batchmeters, timers, consistency meters.
- 1—100-ton steel bin.

MISCELLANEOUS

- 1—P.A.X. automatic telephone switchboard with 76 phones.
- Pole line hardware.
- Floodlites—500 to 1500 w.
- 1—1½ cu. yd. heavy duty clamshell bucket.
- 12—Muck skips, 7—14 cu. yds.
- 50—Chicago pneumatic concrete vibrators, Nos. 417, 518 and 519.
- Several sizes of monkey wrenches, wood borers, chipping and riveting guns.
- New and used rubber hose, 3/4" to 4".

MACHINERY AND SUPPLIES

- 1—125 kw. motor generator set, 275 volts D.C.
- Complete stock of warehouse supplies.
- Complete line of transformers and electric motors.

ALL ITEMS SUBJECT TO PRIOR SALE

PACIFIC CONSTRUCTORS, INC.
GENERAL CONTRACTORS—BOX 898, REDDING, CALIFORNIA

Phone 512 and 1779 REDDING

YES... THEY'RE ALL OWEN

CLAMSHELL BUCKETS

THE OWEN BUCKET CO.
6060 Breakwater Ave., Cleveland, O.
BRANCHES: NEW YORK, CHICAGO, CALIFORNIA

**TENNESSEE VALLEY AUTHORITY—
DEPARTMENT OF PROPERTY AND SUPPLY
SURPLUS CONSTRUCTION EQUIPMENT
FOR IMMEDIATE SALE AND DELIVERY**

EQUIPMENT INCLUDES

Barges and Boats
Batchers, Buckets and Hoppers (concrete)
Binders, Bar
Blowers, Roots-Connersville
Cars, Mining and Flat
Cement Unloading Units
Changers, Frequency
Classifier, Sand (Dorr)
Compressors, Portable
Concrete Mixing Plants
Converters
Conveyors, Belt, Screw and Bucket
Cranes, Electric Revolving
Cranes, Hammerhead
Drills, Rock (all sizes and types)
Elevators, Bucket
Feeders, Vibrating
Graders, Elevating and Patrol

Hammers, Forging and Pile Driving
Hoists, Electric, Pneumatic and Steam
Instruments, Engineering
Jacks, 50 to 500 tons
Lathes, Wood and Metal
Locomotives, Electric, Diesel and Gas
Mill, Rod
Mixers, Concrete, Portable and Stationary
Motors, Electric, $\frac{1}{4}$ to 800 hp.
Pumps, all sizes and types
Scrapers, Cement and Earth
Screens, Vibrating
Silos, Cement, 4,000 to 6,000 bbl.
Stackers, Sand
Trencher, Excavating
Tunnel Equipment
Vibrators, Electric and Gas
Welders, Electric and Gas

If Interested, Phone or Write for Catalog, Bulletin No. 3

**SALES AND TRANSFER SECTION
OLD POST OFFICE BUILDING, KNOXVILLE, TENN.
TELEPHONE: 2-7181—EXT. 873**

Four-wheel Drive Truck

Manufacturer: Dodge Div., Chrysler Corp., Detroit, Mich.

Equipment: General purpose truck.

Features claimed: Newest addition to the Dodge job-raided truck line is the Power Wagon, a sturdy, full size, 4-wheel drive, one-ton, general purpose truck. It has a 94 hp. engine, 4-speed transmission, steel express body, 8 ft. long $4\frac{1}{2}$ ft. wide and



22 $\frac{1}{2}$ in. high. Wheelbase is 126 in. and maximum payload is 3,000 lbs. A dual power take-off is available to deliver 536 rpm. at the tail shaft to operate auxiliary machinery. The power take-off also operates a front-mounted power winch of 7,500 lb. capacity.

Mobile Asphaltic Mix-Paver

Manufacturer: Hetherington & Berner, Inc., Indianapolis, Ind.

Equipment: Self contained, self propelled asphalt mixing and laying machine.

Features claimed: Plant capacity is 100 to 120 tons per hour of low cost or medium type bituminous mix. Paving speed can be varied as desired between 4 to 50

**DOES the JOB
FASTER—
MICHIGAN
Mobile SHOVEL
MODEL T-6-K**

**FINGERTIP
AIR CONTROLS**
•
**1/2 YARD
SHOVEL**
•
6 TON CRANE

**MICHIGAN
POWER SHOVEL CO.**
BENTON HARBOR, MICHIGAN

Diamond Drilling

**Grout—Foundation
—Exploration—**

Our many years' experience, modern equipment and experienced crews will save you time and money.

For any drilling problems consult us.

LYNCH BROS
DIAMOND DRILL
CONTRACTORS

3425 STONE WAY — SEATTLE 3, WASH.

ft. per min. by a separate engine drive so that rate of mix is not directly affected by the paver speed. The new plant is approximately 8 ft. wide by 22 ft. long, mounted on pneumatic tires, so that it can travel on its own power at a rate of 15' to 18 m.p.h. The Moto-Paver carries two 500-gal. bitumen tanks which are jacketed and means are provided to heat both of these tanks as well as the pumps and mixing chambers. The plant can be used either as a traveling mixer and paver in which the aggregate can be dumped direct from trucks or, with a special attachment, windrowed material can be picked up off the road.

Motor Truck Crane

Manufacturer: Browning Crane and Shovel Co., Cleveland, O.

Equipment: Two-motor truck crane.

Features claimed: A rubber-mounted 2-motor crane, designed to permit immediate transfer of travel and steering functions from chauffeur's cab to crane operator's cab is announced. The crane is operated from the chauffeur's cab at truck



speed when traveling overland or through congested areas. At the job, truck functions are taken over by the crane operator through the "Tu-Control" mechanism. He can move the truck forward, back or around turns with the truck engine shut off, thus assuring precise control over the truck in relation to the load on the boom.

Grading Machine

Manufacturer: Warner & Swasey Co., Cleveland, Ohio.

Equipment: New type excavator.

Features claimed: A new grading machine called the "Gradall," designed to permit earth moving in places not ordinarily accessible has been invented by Ray Fer-





Parts
readily available



Replacements
easy, simple and quick

At some point in its service-life, every machine or accessory which is steadily employed requires a new part. Whether this be due to accident, abuse or ordinary wear, the important point is to be able to get the part in the shortest time and install it with the least possible delay, to minimize the cost of "down-time."

Recognizing the manufacturer's responsibility, the Twin Disc Clutch Company did two things:

First, Twin Disc engineers designed the diversified line of standard Twin Disc Clutches and Hydraulic Drives to make parts replacement simple, easy and quick.

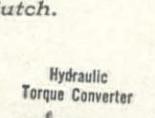
Second, the Twin Disc Clutch Company has made replacement parts for its units *quickly available* either through those manufacturers who furnish Twin Disc products as original equipment or through the Twin Disc Clutch Company's 6 factory branches and 31 parts stations, covering all important industrial centers.

That's one reason why builders of all types of dirt-moving machinery say: "Let's standardize on Twin Disc Friction Clutches or Twin Disc Hydraulic Drives." **TWIN DISC CLUTCH COMPANY**, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

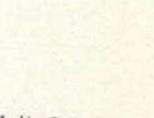
*Above: Power Take-off.
Below: Model E Clutch.*



Reduction Gear



Hydraulic Torque Converter



Machine Tool Clutch

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U. S. PAT. OFF.

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

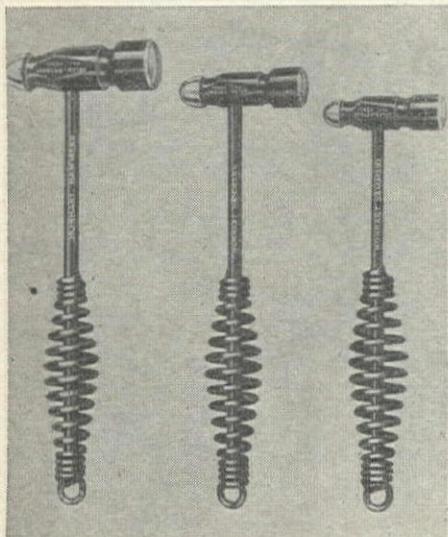
werda, a Cleveland contractor. The machine is hydraulically operated and has an expandable 24-ft. boom of arc welded construction. The machine will not be sold through regular Warner & Swasey machine tool distributors, but through road machinery sales outlets.

All Metal Hammers

Manufacturer: Atlas Welding Accessories Co., Detroit, Mich.

Equipment: All metal ball-pein hammers.

Features claimed: Hammer heads are of the finest alloy tool steel, flame hardened, and the all-steel handle eliminates the weakness of conventional wood handles by



being unbreakable, unsusceptible to burning or splitting and will not come loose, since no wedges are required. The handle is shaped to fit the hand and has a flexible quality which absorbs the shock of hammer blows. More "wallop" is delivered with less muscular effort because of the balanced weight distribution.

Magnetic Shovel Clutch

Manufacturer: Harnischfeger Corp., Milwaukee, Wis.

Equipment: Magnetic torque swing unit for shovels.

Features claimed: For the first time in excavator history an electric clutch has been successfully applied to large friction type shovel controls and has proven eminently successful. The "Magnetorque" unit, already in operation on several new P & H 3-cu. yd. excavators, eliminates complicated linkages and the excessive wear and tear of conventional friction clutches. Since the swing is the hardest working part of the shovel in accelerating and braking both the revolving structure of the cab and boom as well as the load, the magnetic clutch is especially adapted to apply a smooth positive control to this hard working part. The new "Magnetorque" transmits power for the swing or propel motions by means of electromagnetic forces, and the unit is good for the life of the machine.

In applying the Magnetorque swing unit to their new Model 1055 friction shovel the company has mounted it on the jackshaft in much the same manner as the conventional swing clutch, where it is driven by the 240-hp. diesel engine. On the diesel is a small generator which furnishes excitation for the transmission of power.

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, California.

Pittsburgh Testing Laboratory, Pittsburgh, Pa.—A new brochure interpreting and illustrating the three major phases of this organization's extensive facilities has been published. It details PTL's independent fact-finding functions, one of which is testing of materials; another is field inspection and testing, and the third is product performance testing to determine how all designs and materials fulfill the requirements of intended service. Interesting photographs illustrate the brochure.

Executone, Inc., New York, N. Y.—A small folder has been put out describing Executone Home Inter-Com which provides natural conversation between any two rooms in a home. "It is easy to install, easy to operate, and easy to buy."

Caterpillar Tractor Co., Peoria, Ill.—"Diesels With Endurance" is the title of a new booklet published by the tractor firm. Durability and versatility of performance in construction work are highlighted in this well-illustrated 24-page book. It presents an interesting portrayal of endurance marks by machines, some of which are no longer in production but still serving.

Daniels-Murtaugh Co., Cedar Rapids, Ia.—Bulletin 115, just off the press, pictures and describes with complete specifications

NOW AVAILABLE! CONSTRUCTION DESIGN CHARTS

With jobs piling up there's no time to waste these days on tedious figuring of routine problems. The new edition of *Construction Design Charts*, by Prof. James R. Griffith, gives you the answers in a flash! Engineers—carpenters—concrete men—foremen—superintendents—there's a whale of a value in this book for every man engaged in construction today!

The new revised edition contains 72 charts, instead of the 48 published in the original book. *Construction Design Charts* is the only book of its kind ever published by *Western Construction News*. Covered in sturdy black fabrikoid, stamped in gold, the book has a special metal binding that allows each page to lie flat for easy reference.

YOU GET ALL THIS—How Nomographs Are Constructed; Concrete Design; Concrete Form Design; Earthwork; Highway Design; Hydraulics; Structural Design; Compressed Air Transmission; Measurement of Triangular Areas—PLUS MUCH MORE

MAIL THIS COUPON TODAY!

KING PUBLICATIONS

503 Market St., San Francisco, 5, California

YES, I want a copy of CONSTRUCTION DESIGN CHARTS, for which I enclose \$3.00. Add 8c sales tax if ordering from a California address.

Name.....

Address.....

Position..... P. O.

Company..... State.....

PUNCH-LOK

Hose Clamps and Fittings

LOOK, it's locked for safety



Today's Best Bet!

FOR YOUR PRODUCTION AND MAINTENANCE OPERATIONS

For descriptive catalog and name of nearest distributor, write Harry M. Thomas, Pacific Coast Representative, Dept. B, 1554 Oakland Ave., Piedmont 11, Calif.

PUNCH-LOK COMPANY

321 No. Justine Street, Chicago 7, Illinois

all types of Daniels-Murtaugh teeth for dippers and dragline buckets, featuring "Daniels-Murtaugh Dipper Teeth," the wear-sharp penetrator point of forged alloy steel, which is double-keyed to a Weld-adapter tooth and held by tack welding. Also pictured are various applications of "Wear-Sharp" cast-to-shape manganese steel re-pointers. DMCO nickel-manganese steel welding rods for replacing points and build-up welding are listed with prices.

Ilg Electric Ventilating Co., Chicago, Ill.—"An Engineer Looks at Ilg" tells the content of a new book that is a word and picture story of what a consulting engineer saw as he made a tour of the Ilg plant. Several pages picture the operations performed on Ilg motors, a stop is made in the centrifugal fan department, and two pages of pictures show the manufacture and assembly of unit heaters. The visiting engineer takes a tour through Ilg's new research laboratory and talks with Ilg executives and employees.

Chain Belt Co., Milwaukee, Wis.—The new streamline Rex 6S mixer, the Rex 3½S end discharge tiltler and the Rex Skipper are pictured and described in Bulletin No. 480 put out by this firm. Small sketches emphasize many machine innovations, and large illustrations show the main mechanical features. Two pages give a composite set of specifications of the three mixers.

R. G. LeTourneau Inc., Peoria, Ill.—Especially prepared for maintenance and service men, a wall chart, 17 x 22 in., is now available as a guide in lubricating LeTourneau equipment. Photographs show lubrication points on every piece of LeTourneau equipment, and the chart, which can be conveniently hung, tells what kind of lubricant to use and when, to help avoid prematurely worn-out parts.

B. F. Goodrich Co., Akron, O.—What this firm's cord belt did at Shasta Dam and why it outperforms all other conveyor belts is explained in a new folder, illustrated with photographs of Shasta Dam, one of the world's largest concrete structures.

Charles Bruning Co., Inc., Chicago, Ill.—A Bruning refillable draftsman's pencil, with the new clutch that protects lead from breakage, is featured in a small pamphlet. The clutch which is responsible for the lead not breaking, holds the lead firmly in the non-slip rubber grip.

Union Wire Rope Corp., Kansas City, Mo.—"Rope Dope" is the title of an educational bulletin, one of a series of nine to provide a reference index for industrial users of wire rope. By writing for the first in the series, the rest will automatically be received.

International Nickel Co., Inc., New York, N. Y.—Revised List "A" of current publications on nickel alloy steels, nickel cast irons, nickel brass and bronzes and nickel plating is now available. Publications include the fabrication, production, properties and uses of nickel alloys for industrial applications, and the properties, production and use of nickel electrodeposits.

Hyster Co., Portland, Ore.—A turquoise, gold, black and white booklet attractively shows how Hyster products are "money makers for the general contractor." The new Hystaway combines for the first time dragline, clamshell, crane, with "Caterpillar" track-type tractor and bulldozer, all in one working unit. Hyster products are sold and serviced by "Caterpillar" distributors and dealers.



FIRST TRULY MODERN CLAMSHELL BUCKET •

MODERN ALL-WELDED CONSTRUCTION

Gives smooth working surface and most efficient weight distribution for balance and greater digging efficiency. Stronger and longer-lived because of solid, heavy plate construction.

MODERN DESIGN

Wide, low-sided clams, with wide, solid lower arm brackets provide a capacity load and reduce spillage. Solid base plate in lower sheave block keeps sheaves clean and prolongs life. Hard cutting manganese lip edge actually gets tougher with use.

FAST OPERATION

Larger diameter sheaves, with fully sealed needle roller bearings instead of bronze bushings, reduce power loss by friction, deliver full power to cutting edge, combine to provide faster, smoother operation.

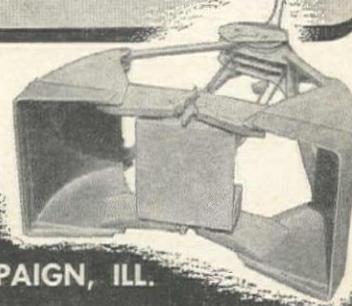


3/8 to 2 1/2 yard sizes. General Purpose, Wide Rehandling and Heavy-Duty Digging Type.

WRITE TODAY FOR FULL INFORMATION.

THE C. S. JOHNSON COMPANY

KOEHRING SUBSIDIARY, CHAMPAIGN, ILL.



DO IT THE *Easy Way*
WITH A **HI-WAY** Spreader.



★ You can do a BETTER job FASTER with LESS manpower when a HI-WAY SPREADER "takes over". ★ There's a HI-WAY SPREADER for your particular job.

See and consult your nearest dealer.

Arizona	Equipment Sales Co.	131 No. 1st Street	Phoenix
California	Lee & Thatro Equipment Company	820 Santa Fe Avenue	Los Angeles
California	Spears-Wells Machinery Company	1832 West 9th Street	Oakland
Colorado	Harris Highway Equipment Company	1031 E. 4th Street	Pueblo
Colorado	Power Equipment Company	601 E. 18th Avenue	Denver
Idaho	Intermountain Equipment Company	Broadway at Myrtle Street	Boise
Montana	Westmont Tractor & Equipment Company	150 E. Spruce Street	Missoula
Nevada	Sierra Machinery Company	1025 E. Fourth Street	Reno
Oregon	Feenbaugh Machinery Company	Home Office	Portland, Oregon
Utah	C. H. Jones Equipment Company	236 W. S. Temple Street	Salt Lake City
Washington	Feenbaugh Machinery Company	Home Office	Portland, Oregon
Wyoming	Worham Machinery Company	517 W. 17th Street	Cheyenne

HIGHWAY EQUIPMENT CO., INC.

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS

CEDAR RAPIDS, IOWA, U. S. A.

Speaking of Employment . . .

WANTED

Civil and Construction Engineers, Inspectors of Construction, and Engineering Survey Crews for assignment to various projects in Arizona. Preference to veterans or individuals with previous government experience.

Write M. H. MITCHELL
Regional Personnel Officer
Bureau of Reclamation
Boulder City, Nevada

ENGINEER

Chief, structural steel fabrication.
San Francisco Bay Area. Detail and Industrial Building design experience essential. Salary open.

BOX 973
WESTERN CONSTRUCTION NEWS
503 Market Street, San Francisco 5, Calif.

CIVIL ENGINEER

Age 26, BS and MS in CE, 2½ years' experience structural design in all materials, 1 year experience as office engineer on airport and airbase construction, 2 years teaching in engineering college. Available on short notice. Desire position with contractor or consulting engineer with future possibilities. Rocky Mountains or Pacific Coast preferred.

BOX 972
WESTERN CONSTRUCTION NEWS
503 Market Street, San Francisco 5, Calif.

CONSTRUCTION ENGINEER

25 years' experience on reservoir and dam construction, pile driving, cofferdams and waterfront work. Where is the job?

Write BOX 980
WESTERN CONSTRUCTION NEWS
503 Market St., San Francisco 5, California

EXPERIENCED LOCOMOTIVE ENGINEER

Age 26, married, desires work with large construction company in Western United States or abroad. Ref.: Southern Pacific R. R.

Write BOX 976
WESTERN CONSTRUCTION NEWS
503 Market St., San Francisco 5, California

DESIGNER

Structural Steel, Industrial Buildings.
Also Junior. San Francisco Bay District.

BOX 974
WESTERN CONSTRUCTION NEWS
503 Market St., San Francisco 5, California

POSITION WANTED

Age, 41, I. C. S., desires position with contractor or building materials, surveying, mapping and concrete engineering. 21 years' experience on construction in various capacities as party chief—estimator on excavation—office work—field engineer—carpenter foreman—concrete foreman—water proofing and supervisor of general construction. Willing to do diversified work, adaptable know-how. References.

Write BOX 979
WESTERN CONSTRUCTION NEWS
503 Market St., San Francisco 5, California

OPERATOR

Tournapull, Blade, Dozer, Carryall operator desires foreign employment. "A-1" references furnished, including Canada and Alaska.

Write BOX 977
WESTERN CONSTRUCTION NEWS
503 Market St., San Francisco 5, California

**UPON THE STRONG,
GREATER STRENGTH IS BESTOWED**

A Statement by
FOOD MACHINERY
CORPORATION
in regard to
Dayton-Dowd

An important advance in the history of the pumping industry now for the first time makes available a new conception of integrated pump service to customers. *Dayton-Dowd*, long associated with sustained high quality—a distinguished name on centrifugal pumps—has become an integral part of the Peerless Pump organization.

This merger of broad installation-wise experience, modern technical research and alert engineering talent assures our customers for both Horizontal and Vertical types of pumps that the name "Peerless" stands as the guarantee for quality and progress.

**PEERLESS
HORIZONTAL PUMPS**
—formerly *Dayton-Dowd*

PEERLESS PUMP DIV.—FOOD MACHINERY CORP.
Factories: Los Angeles, Calif., Quincy, Ill., Canton, O.

WAR-TIME BUILDERS OF THE VICTORIOUS "WATER BUFFALO"
PEACE-TIME BUILDERS OF TOP-FLIGHT WATER PUMPS

F.M.C.
builds
with
STEEL

ETNYRE

"Black-Topper"

BITUMINOUS DISTRIBUTORS



SEE YOUR ETNYRE DEALER...

ALLIED EQUIPMENT CO.

INTERMOUNTAIN EQUIP. CO.

Reno, Nevada Boise, Idaho

THE CROOK CO.

KIMBALL EQUIPMENT COMPANY

Los Angeles, Calif.

Salt Lake City, Utah

PAUL FITZGERALD

NEIL B. McGINNIS CO.

Denver, Colorado

Phoenix, Arizona

R. L. HARRISON CO.

STUDER TRACTOR & EQUIP. CO.

Albuquerque, N. Mex.

Casper, Wyoming

HOWARD-COOPER CORP.

A. L. YOUNG MACHINERY CO.

Seattle, Spokane, Wash.; Portland, Ore.

San Francisco, Calif.



E. D. ETNYRE & CO., Oregon, Illinois

OPPORTUNITY SECTION

Specialist in MOVING HEAVY EQUIPMENT & RIG-UP WORK

I. C. C. Authority
Colorado, Wyoming, Montana, North and South Dakota

Pipe Stringing, Pipe Lining, Building and Construction—Trucks, Tractors, Trenchers, Electric Welders, Water and Sewer Projects, Cranes, Back Hoe, Dragline.

Warehouses and Yards at Riverton and Rawlins, Wyoming; Craig, Colorado.

DAWSON & CORBETT
Phone 837-W Rawlins, Wyoming

PUMPCRETES

RECONDITIONED AND GUARANTEED
1 Model 180, Double, with Pugmill Remixer, gasoline engine driven. 5 Model 200 Double, with Pugmill Remixer, electric motor driven. 10,000 feet of 8-inch Pipeline. Very attractively priced.

BROWN-BEVIS EQUIPMENT CO.
4900 Santa Fe Avenue, Los Angeles 11, California

FOR SALE

1 cu. yd. shovel, P&H Model 600A, located Missoula, Montana. Price as is, \$3500. About \$500 new parts included.

L. A. Woodward
MISSOULA, MONTANA

FOR SALE

One 15-ton Lidgerwood Cableway complete with electric motor, cables and all fittings. Lines are sufficient length to operate 2400 ft. span. For information, write

R. R. BROWN
5305 Esmond Avenue, Richmond, California

Do You Need a Sales-minded Advertising Man in Your Organization?

Ex-Naval officer. Pre-war advertising and promotion supervisor with prominent manufacturer. Experience backed by broad, intensive advertising training preceded by five years' successful selling and merchandising. Cornell University AB, 1934, with two years' civil engineering. Graduate of several Naval technical courses. Four years' Naval experience: enlisted man; cadet; and following captivities as officer; cadet training ship, combat escort vessel, combat cargo ship. Married, age 33. Now on terminal leave. Write today: 1425 Paru Street, Alameda, California.

POWDER FOREMAN

desires position with construction firm or powder camp located near Los Angeles. Has worked throughout Eastern and Western United States, and can furnish excellent references on request.

Write BOX 975

WESTERN CONSTRUCTION NEWS
503 Market St., San Francisco 5, California

BRUNSON INSTRUMENTS

In Service All Over the World

Brunson Instruments give you dust proof guaranteed accuracy.

Free revolving in all temperatures.

We repair all makes.

Good used Transits and Levels are carried in stock for sale, rent or trade.

List mailed on request.

Write us for literature covering BRUNSON

Transits, Levels,



One of our Rebuilds

and other Engineering Equipment. On request we will mail booklet describing the patented BRUNSON dust proof ball bearing spindles which can be installed on any make engineer's transits and levels. Learn how we completely rebuild your old instruments, refinish them, furnish with new tripod, and guarantee them to look and perform like new.

BRUNSON INSTRUMENT COMPANY
1405-D Walnut St., Kansas City 6, Mo.

DULIEN BUYS SELLS LIQUIDATES

MINES, MILLS, RAILROADS

RELAYING RAILS AND ACCESSORIES

INDUSTRIAL PLANTS AND EQUIPMENT OF ALL KINDS

FOR SALE
Limited Quantity
Portable Gas-Driven
4 Cu. Ft.
AIR COMPRESSORS

DULIEN STEEL PRODUCTS, INC. OF CALIFORNIA

11611
So. Alameda
Los Angeles 2,
California



604
Mission St.
San Francisco 5,
California

For Sale—

SHASTA DAM SAND AND GRAVEL PLANT AND 10-MILE CONVEYOR EQUIPMENT

Including:

8500—36" AND 42" IDLERS.
Pulleys and Drives.
LATE MODEL 200 HP., 1800 R.P.M. GE MOTORS, complete with Starting Equipment.
Western Gear Reducers, 200 HP., 40 to 1 Ratio.
Dorr Hydroseparators and Classifiers.
30" Tripper and Trestle.
Merrick Feedweights and Weightometers.
All Types of Pumps, complete with Drives.
42" Pendulum Boom Conveyors, 100' and 200'.
Electric Line Equipment, Transformers, Motors and Supplies.
Other Miscellaneous Contractors' Equipment.

Subject to Prior Sale

Write, Wire or Telephone Redding 1440

COLUMBIA CONSTRUCTION CO., INC.
Box 579 Redding, California

FOR SALE

15,000 Feet
18-inch Diameter Machine Banded

WOOD STAVE PIPE

6 to 20 ft. lengths

Has been assembled but never used.

AT 1/4 ORIGINAL PRICE

IDAHO EQUIPMENT COMPANY
GRAND LAKE COLORADO

WANTED—USED PIPE

3000 FEET OF 8 INCH 10 GAGE, WALL OR HEAVIER, USED OR RECONDITIONED STEEL PIPE

B. TIMAEUS
819 MIRAMAR BERKELEY CALIFORNIA

MOREHEAD MANUFACTURING CO. DETROIT MICHIGAN

Announce Appointment of

BROOKS EQUIPMENT COMPANY

SAN FRANCISCO OFFICE
636 POTRERO AVE., SAN FRANCISCO 10, CALIF.
Phone VAlencia 8223

LOS ANGELES OFFICE
1159 SOUTH HILL ST., LOS ANGELES 15, CALIF.
Phone PRospect 4378

California Sales Representatives
for Morehead "Back-to-Boiler"
Traps and All Types of Morehead Equipment for Steam Drainage and Boiler Supply

SHOVELS AND CRANES

- 1—Bucyrus GA-2 with 1 1/4 yd. Shovel Front and 55' Dragline Boom.
- 1—Bucyrus D-2 with 1 yd. Shovel Front, Diesel powered.
- 1—Northwest Model 4 with 1 yd. Shovel Front.
- 1—American 15-ton Standard Gauge Locomotive Crane with 40 ft. Boom, gas-engine powered.

Subject to prior sale

Sundfelt Equipment Co.
Main 1474
3422 First Avenue South, Seattle 4, Wash.

INDEX TO ADVERTISERS

★ IN THIS ISSUE ★

Advertiser	Page	Advertiser	Page	Advertiser	Page
Adams, J. D., Mfg. Co., The	65	Galion All Steel Body Co.	158	Page Engineering Company	161
Air Reduction Sales Co.	54	Gar Wood Industries	21 & 59	Parsons Company	155
Allis-Chalmers Mfg. Co.	12 & 13	General Excavator Co.	150	Peerless Pumps Division, Food Machinery Corp.	168
American Chain & Cable Co., Inc.	3d cover	Goodall Rubber Company	140	Peterbilt Motors Company	81
American-Marietta Company	136	Goodyear Tire & Rubber Company	7	Pettibone-Mulliken Corp.	55
Anthony Company, Inc.	142	Gorman-Rupp Company	158	Pierce Governor Co., Inc.	39
Athey Products Corp.	75	Harnischfeger Corp.	136	Pioneer Electric Company	148
Atlas Powder Company	70	Hercules Roller Company	138	Preformed Wire Rope Information Bureau	84
Austin-Western Company	88	Hetherington & Berner, Inc.	160	Punch-Lok Company	166
Autocar Company, The	35	Highway Equipment Co.	167	Quick-Way Truck Shovel Company	74
Barber-Greene Company	26	Huber Mfg. Co.	32	Rapid Pavement Breaker Company	134
Barco Mfg. Co.	43	Hyster Company	79	Raymond Concrete Pile Company	4th cover
Barrett Div., Allied Chem. & Dye Corp.	147	Idaho Equipment Company	169	Reconstruction Finance Corp.	66 & 78
Bay City Shovels, Inc.	46	Independent Pneumatic Tool Co.	63	Richfield Oil Company	58
Beall Pipe & Tank Corp.	134	Ingersoll Steel & Disc Division, Borg-Warner Corporation	132	Riddell, W. A., Corp.	146
Beebe Brothers	132	Insley Mfg. Co.	76	St. Paul Hydraulic Hoist Company	157
Broderick & Bascom Rope Co.	60	International Harvester Co., Inc.	6 & 11	Salem Iron Works	28
Brown-Bevis Equipment Co.	169	Iowa Mfg. Co.	72	Seaside Oil Company	130
Brown, R. R.	169	Isaacson Iron Works	73	Shell Oil Company	83
Brunson Instrument Co.	169	Jaeger Machine Company	135 & 141	Sisalkraft Company, The	151
Buckeye Traction Ditcher Co.	36	Johns-Manville Corp.	40 & 41	Skilsaw, Inc.	67
Bucyrus-Erie Company	10	Johnson, C. S., Company	167	Smith Engineering Works	64
Buda Company	44 & 45	Johnston, A. P., Company	170	Southwest Welding & Mfg. Co.	61
Buffalo-Springfield Roller Co.	149	Keystone Asphalt Prod. Co.	136	Standard Oil Company of Calif.	27
Byers Machine Company	34	Koehring Company	29	Standard Steel Corp.	69
California Corrugated Culvert Co.	159	La Plant-Choate Mfg. Co., Inc.	23	Sullivan Machinery Co.	131
Case, J. I., Co.	47	Leschen, A., & Sons Rope Co.	125	Sundfelt Equipment Company	169
Cast Iron Pipe Research Co.	77	LeTourneau, R. G., Inc.	71	Tennessee Valley Authority	164
Caterpillar Tractor Company	53	Lima Locomotive Works, Inc.	82	Texas Company	2nd cover
Chicago Bridge & Iron Co.	86	Lincoln Electric Company, The	16 & 17	Thew Shovel Company, The	127
Chicago Pneumatic Tool Company	56	Link-Belt Speeder Corp.	80	Tide Water Assoc. Oil Company	68
Cleveland Trencher Company	162	Lynch Brothers	164	Timken Roller Bearing Co., Inc.	33
Columbia Construction Co.	169	M. R. S. Mfg. Co.	18 & 19	Trackson Company	52
Columbia Steel Company	22	Mack Manufacturing Corp.	85	Trailmobile Company	24
Consolidated Steel Corp.	57	Mall Tool Company	133	Twin Disc Clutch Company	165
Cook Brothers	143	Marion Steam Shovel Company	20	Union Iron Works, Inc.	126
Cummins Engine Company	31	Marlow Pumps	139	Union Wire Rope Corp.	48 & 49
Dawson & Corbett Contractors	169	McKiernan-Terry Corp.	142	Unit Crane & Shovel Corp.	25
De Soto Foundry, Inc.	14	Michigan Power Shovel Co.	164	United States Steel Corp.	22
Diamond Iron Works, Inc.	30	Minneapolis-Moline Power Implement Co.	144	Universal Engineering Corp.	62
Dulien Steel Products Co.	169	Morehead Mfg. Co.	169	Victor Equipment Co.	38
Electric Tamper & Equipment Co.	152	Northwest Engineering Co.	3	War Assets Corp.	66 & 78
Etnyre, E. D., Company	168	Oliver Corp.	37	Wellman Engineering Corp.	154
Euclid Road Machinery Co.	4	Osgood Company	150	Wood Mfg. Co.	145
Fir-Tex Insulating Board Co.	156	Owen Bucket Company	163	Woodward, L. A.	169
Foote Company, Inc., The	50 & 51	Pacific Constructors, Inc.	163	Woolridge Company	9
Ford Motor Company	8	Pacific Wire Rope Company	137	Worthington Pump & Machinery Corp.	128 & 129
Fornaciari Company	42, 43, 44 & 45				
Four Wheel Drive Auto Co., The	15				
Fuller Mfg. Co.	153				

Johnston Stainless Welding Rods

DISTRIBUTED BY

ANDERSON EQUIPMENT CO.
644 E. Florence Avenue, Los Angeles 1

ARIZONA WELDING EQUIPMENT CO.
230 South Central Avenue, Phoenix, Arizona

J. E. HAZELTINE & CO.
Second Avenue and Ash Street
Portland 4, Oregon
510 First Avenue, South
Seattle 4, Washington

RENFRO PRODUCTS CO.
1266 South Boyle Avenue, Los Angeles 23

WELDING SERVICE SALES, INC.
926 Howard Street, San Francisco 1