WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

PUBLISHED MONTHLY
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MAY • 1947

35 CENTS A COPY
$4.00 PER YEAR

SUMMER CLOUDBURST over Lake Mead bears an astonishing photographic likeness to an atomic bomb blast, but will not materially affect the amount of water stored behind Hoover Dam, which now stands at six-tenths of capacity. Entire Southwest is seriously short of water this year.

REDUCE YOUR OPERATING COSTS

EFFECTIVE lubrication cuts operating costs of heavy-duty Diesel and gasoline engines by assuring efficiency . . . reducing out-of-service time for repairs and overhauls . . . keeping fuel consumption low. You get all these benefits of effective lubrication with *Texaco Ursa Oil X***.

*Texaco Ursa Oil X*** is fully detergent, dispersive, resistant to oxidation . . . made to keep engines clean . . . free from power-stealing sludge, varnish, carbon. *Ursa Oil X*** keeps valves lively and rings free . . . protects parts against wear and bearings against corrosion.

Texaco has lubricants and fuels for all contractors' needs . . . and a Simplified Lubrication Plan that adds economy to improved performance. Call the nearest of the more than 2500 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

MAKE YOUR EQUIPMENT LAST LONGER

Lubricate trucks, tractors, graders, shovels and other equipment with the world-famous chassis lubricant — *Texaco Marfak*. It's longer lasting because it won't squeeze out under heavy loads, won't jar out in rough service. *Marfak* seals out dirt and moisture, too . . . protects parts better with fewer applications.

More than 250 million pounds of Marfak have been used to date!

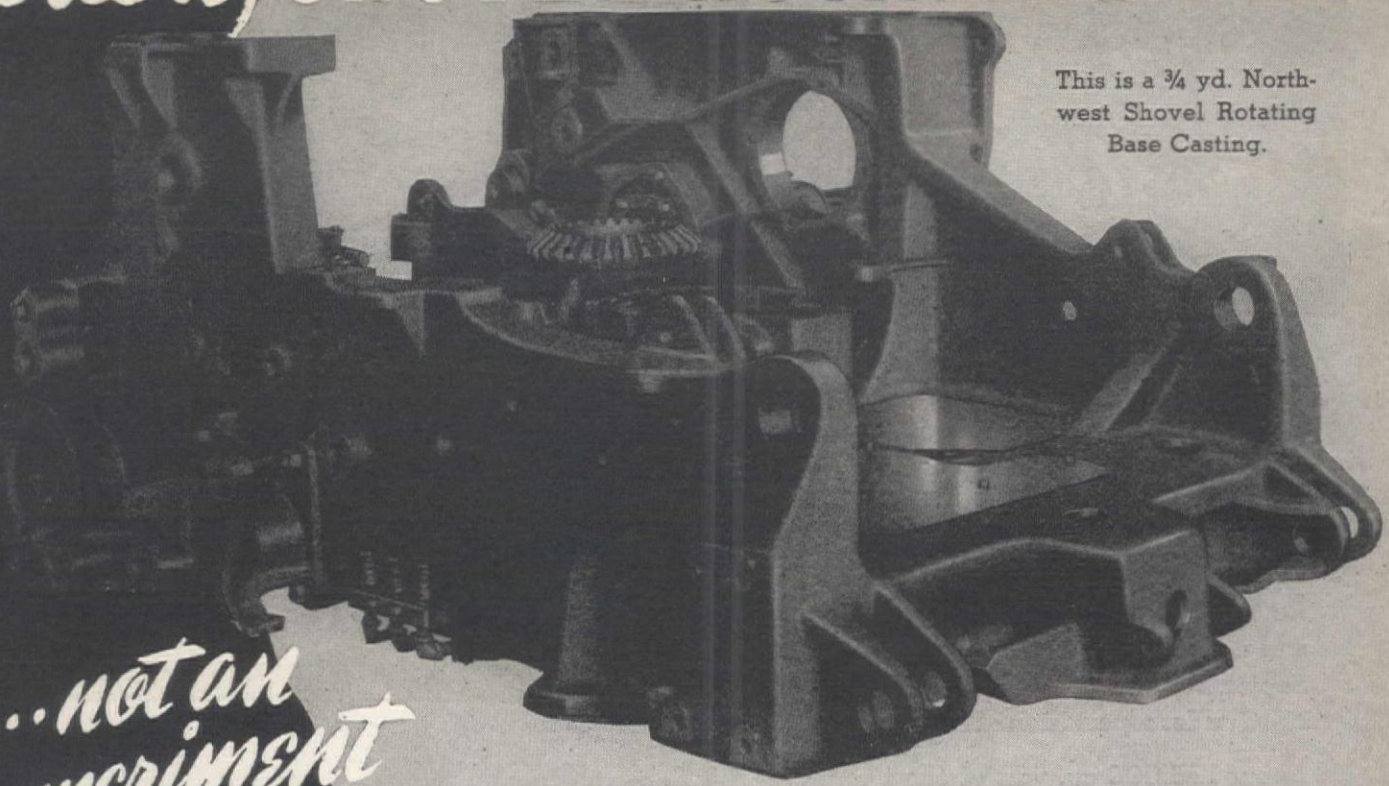
TEXACO REG. T.M.

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

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

Here's a SHOVEL ROTATING BASE



This is a ¾ yd. Northwest Shovel Rotating Base Casting.

...not an experiment at your expense-

COMPARE this with any rotating base on any shovel, crane or dragline you know of—it has no equal! Cast steel bases with cast steel machinery side frames are typical of Northwest design. They have been proved in the toughest service a shovel is ever up against. It is one of the Northwest features that has made Northwest *the* outstanding Rock Shovel.

Here is the strength, the rigidity, the dependability, that assures shaft alignment and freedom from wear in bearings and gears and the elimination of constant repair, characteristic of designs that do not have the years of proved trouble-free service behind them that Northwest Bases have.

It's another of the many reasons why one out of every three Northwests is a repeat order. Plan ahead now to have Northwest output. Follow the Northwest Crowd.

NORTHWEST ENGINEERING COMPANY

135 South La Salle Street — Chicago 3, Illinois

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

ocal NORTHWEST sales agents

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3707 Santa Fe Avenue

SAN FRANCISCO, CALIFORNIA
255 Tenth Street

SEATTLE, WASHINGTON
1234 Sixth Ave., South

RAILROAD RELOCATION

Rushed with Euclids

On this 200,000 cu. yd. contract for relocating main line road bed of the Nashville, Chattanooga and St. Louis Railway north of Cartersville, Ga., MacDougald Construction Company of Atlanta used 6 Bottom-Dump and 3 Rear-Dump Euclids, and a Euclid Loader. Work was begun in September and completed in November, 1946 under supervision of R. E. Armistead.

About 175,000 cu. yds. of chert containing many boulders were loaded into Bottom-Dumps by the Euclid Loader. Although working in difficult material, Loader production was approximately 395 cu. yds. per hour. Rear-Dump Euclids moved 25,000 cu. yds. of shovel-loaded rock on hauls up to ½ mile long.

Ability of Euclid equipment to "keep coming back for more" was a very important factor in completing this job ahead of schedule. MacDougald has used "Eucs" on big earth moving jobs in many parts of the country and now owns a total of 19 Bottom-Dumps, 6 Rear-Dumps and 2 Euclid Loaders. Repeat orders from leading contractors like MacDougald are owner endorsements of the fact that Euclids move more yards at lower cost.

Your Euclid Distributor or Representative will provide literature and information on models best suited to your needs.

The EUCLID ROAD MACHINERY CO., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

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

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WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

Volume 22 MAY • 1947 Number 5

TABLE OF CONTENTS

Covering the Western Half of the National Construction Field

Your Best Bet

INTERNATIONAL

To clear land, cutting out trees at their roots . . . or to move hot slag from an open hearth furnace for a fill . . . these are run of the mill jobs for 'dozer-equipped International Diesel Crawlers.

Bulldogged power, dependability, serviceability and unbeatable operating economy make these tractors your best bet for every job, no matter how tough the going.

Excavate, remove overburden from ore deposits, cut through hills or ridges and build highways, level land for airports or homesites or any other development. Yes, *move the earth* with International Diesel Crawlers . . . fast and economically.

Ask the nearest International Industrial Distributor for specifications or other information. Let him help select your power and equipment.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue — Chicago 1, Illinois

CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

INTERNATIONAL

for Every Job

Diesel Crawlers

← Burnash Construction Company of Flint, Michigan, owns 10 International Diesel Crawlers and one gasoline wheel tractor. Freeman C. Burnash says: "The reasons I have *only* International equipment are: 1. The excellent service received from the distributor. 2. A lot faster machine. 3. Parts are more easily replaced as we don't have to take the whole machine apart to replace them. As long as this continues, our company will use only International equipment." *The photograph on the opposite page shows one of the company's TD-14's working on a land clearing job for a housing project.*

↑ In Cleveland W. E. Plechaty's two International TD-14 Diesel Crawlers saved time and cut costs of moving hot open-hearth slag to fill a 5-acre hole for a building site. 18 carloads are handled each day.

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

INTERNATIONAL HARVESTER

Industrial Power

New high-speed rubber-tired

Model C

Speeds up to 15 m.p.h., forward and REVERSE
4 speed selections from 1.67 m.p.h.

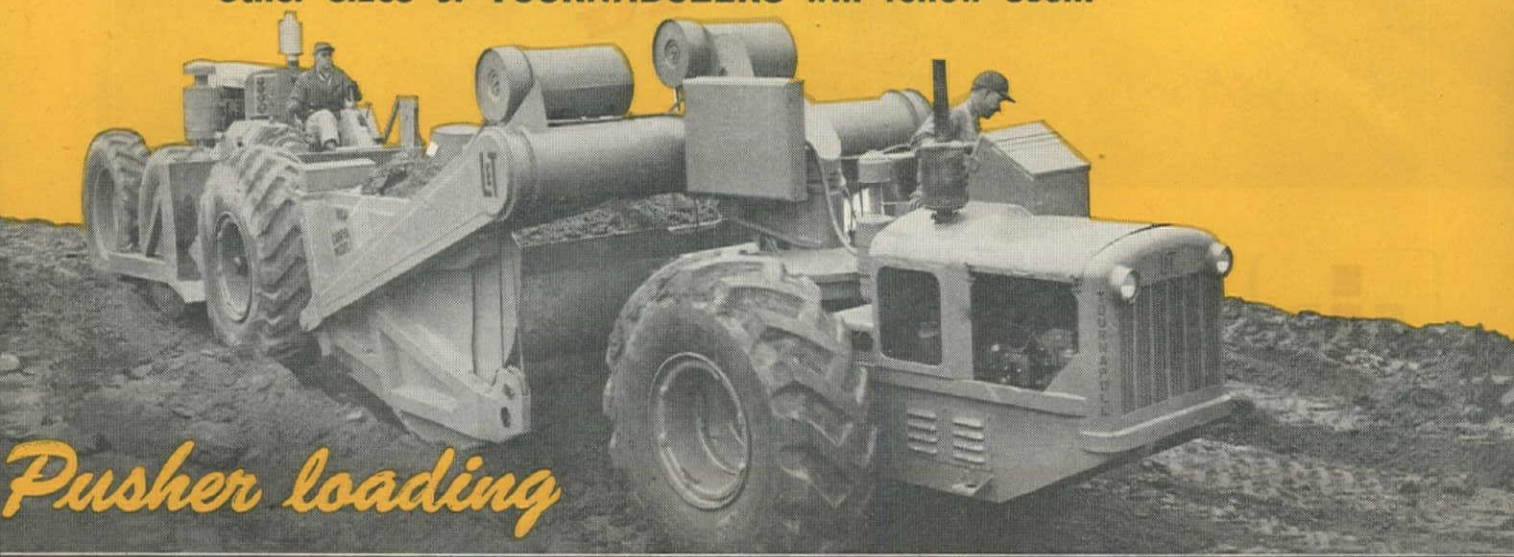
Non-stop, instantaneous speed selection
Constant-mesh Tournamatic transmission.

Easy to operate . . . air-actuated controls
Finger-tip steering, blade operation . . . single pedal for brakes.

Tapered-bead tires . . . 14.00x32 or 21.00x25
Permit low pressure . . . give ground-gripping traction . . . flotation.

Big load capacity . . . 11′ 2″x43″ blade
Blade lift 44″; drop, unlimited; cable controlled; fast-acting.

180 h.p. Diesel . . . weight 14½ tons
Other sizes of TOURNADOZERS will follow soon.



Pusher loading

LE TOURNEAU
LET
EQUIPMENT

See your Le Tourneau Distributor NOW for complete information

TOURNADOZER

Dirtmoving

Material handling

Clearing

LETOURNEAU
PEORIA, ILLINOIS

HIGH-SPEED RUBBER-TIRED

TOURNADOZERS

Uniform Performance

an outstanding Quality of TIMKEN BITS

The ability of Timken Rock Bits to drill faster and further in any kind of rock has made them preferred wherever rock is drilled — in mining, construction and quarrying.

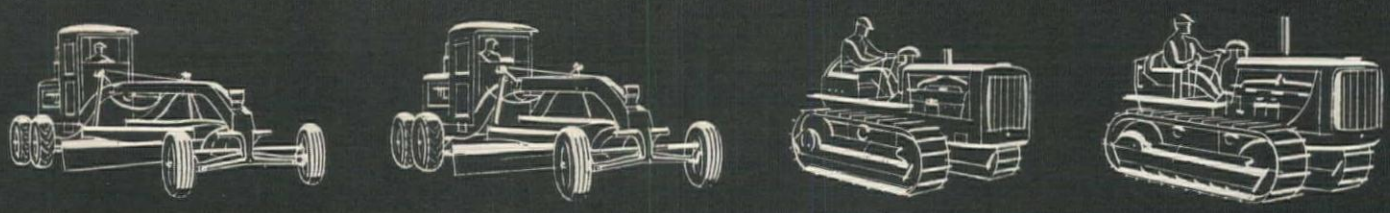
Equally important to their users however — even rated first by some — is uniformity of performance. This means that every Timken Bit will give the same outstanding service in speed of penetration and distance drilled when used in the same kind of rock.

This uniformity is due to the development of the special Timken Steel used in the production of Timken Bits and to Timken metallurgical "know how" in heat treatment and hardening.

Wherever you are, there's a Timken Rock Bit distributor within telephone call. Conversion and reconditioning shops also are conveniently located for quick service. Put Timken Bits to work now and cut your drilling costs while increasing production. The Timken Roller Bearing Company, Canton 6, Ohio.

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

A new "FIGHTING FOUR"!



Now on the production lines are four new "Caterpillar" Diesel Tractors and Motor Graders —with decisively greater horsepower, strengthened design, and many mechanical refinements. All brought to you in line with "Caterpillar's" policy of building ever better products for a steadily increasing number of satisfied users!

Without appreciable added weight, but with engines of increased piston displacement, still tougher materials, free-flow manifolding, larger crankshafts and many other improved features, these new "Caterpillar" Diesels enable you to *handle bigger loads—work at higher average speeds—accomplish more work per day—increase your earnings very substantially.*

These important advancements are the result of many months of quiet, patient but intensive "Caterpillar" engineering, metallurgical research, and factory tooling. They are dedicated to *your* future success and profits. You'll be delighted with further details from your "Caterpillar" dealer.

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

CATERPILLAR

REG. U. S. PAT. OFF.

GREATER HORSEPOWER

FASTER WORKING SPEEDS

MANY IMPROVEMENTS

HIGHER EARNING CAPACITY

• The NEW TRACTORS

The D6

65 drawbar horsepower
2600 pounds additional pull in first

The D4

43 drawbar horsepower
1600 pounds additional pull in first

BOTH

36% larger crankshaft journals
30% larger crankpins
Solid aluminum alloy bearings
Chrome-plated top piston rings
Free-flow manifolding, with individual ports for each cylinder
More effective, single-unit air cleaner
Improved fuel-injection pumps and injection valves
Improved lubricating oil cooling radiator
More effective oil-pressure control
Full-machined cylinder liners, with "no-corrosion" seals

• The NEW MOTOR GRADERS

The No. 12

100 brake horsepower

The No. 112

70 brake horsepower

BOTH

Constant-mesh transmission
Helical gears—for less noise and easier shifting
Arched front axle—for more ground clearance
Steering shock absorber and anti-friction bearings
Improved power-control clutch, with anti-coasting brakes
Other engine refinements as in Tractor engines.

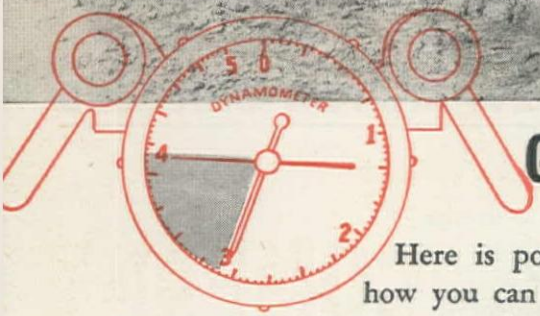
A 50% FACTORY ENLARGEMENT program now under way will speed "Caterpillar" production to meet the huge demand for "Caterpillar" products.

DIESEL

ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Operators know it!

LaPLANT-CHOATE SCRAPERS



GAIN AN EXTRA LOAD EVERY FOUR TRIPS

Here is positive proof of how you can reduce loading time and gain extra pay-yardage with modern LaPlant-Choate scrapers. In recent field tests conducted with dynamometers, other leading scrapers required *a full pound of drawbar pull* for every pound of dirt loaded into the scraper bowl—while on the same tests modern LaPlant-Choate scrapers averaged a pound of load with only *¾ pound of pull.* This LaPlant-Choate saving of 25% in loading naturally means extra yardage at lower cost. And especially on short hauls, it often means *an extra "bonus load" every four trips* — plus added savings in tractor operation and maintenance.

Add to these facts, LPC's job-proved advantages in hauling and spreading and it's easy to see that—*no matter what kind of scrapers you are operating now, you'll be money ahead by replacing them promptly with modern LaPlant-Choate units.* Fortunately, too, you won't have to wait because LPC scrapers in most sizes (from 2 to 14 yards struck measure) are ready for *immediate delivery.* So don't delay. Contact your nearest LPC dealer today and let him show you how you can reduce costs and increase profits with easier loading, faster spreading LaPlant-Choate scrapers. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th Ave., Oakland, California.

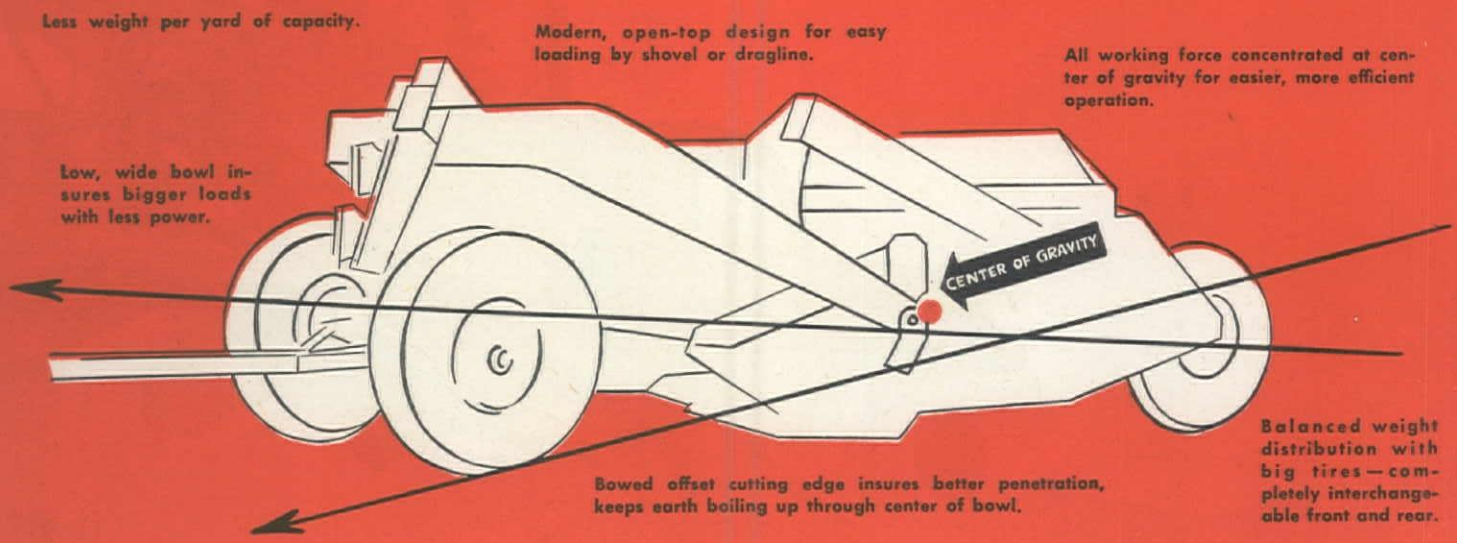
LaPLANT-CHOATE

Positive FORCED EJECTION SCRAPERS

FIRST in Value because they're FIRST in Performance!

Dynamometer tests prove it!

LOAD 25% easier!



. . . Get the facts from your *Nearest LaPlant-Choate Dealer*

INDUSTRIAL EQUIPMENT COMPANY

SAN FRANCISCO • OAKLAND • LOS ANGELES • PHOENIX
RENO • SACRAMENTO • FRESNO • SAN DIEGO

COLUMBIA EQUIPMENT CO.

PORTLAND
BOISE
SEATTLE
SPOKANE

LIBERTY TRUCKS & PARTS CO.

690 Lincoln St.
DENVER, COLORADO

WESTERN CONSTRUCTION EQUIPMENT CO.

505 N. 24th Street
BILLINGS, MONTANA

218 W. Pine Street
MISSOULA, MONTANA

N. C. RIBBLE CO.

Associated With Western States Welding & Press Co.
1304 N. Fourth Street • ALBUQUERQUE, NEW MEXICO

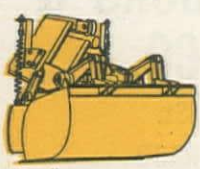
HEINER EQUIPMENT & SUPPLY CO.

501 W. Seventh Street South • SALT LAKE CITY, UTAH

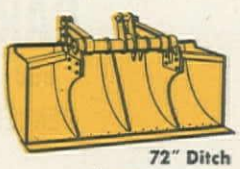
The NEW

LESS THAN 15 MINUTES TO CHANGE ATTACHMENTS!

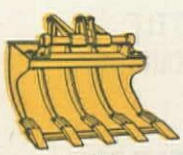
A variety of standard and special tools are quickly interchangeable by simply loosening 2 hex nuts and withdrawing a pin. Shown here are only a few of the standard tools. Many more are available.



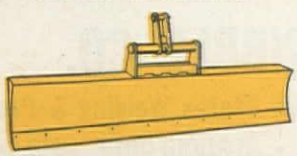
48″ Cleanup Bucket; 72″ Bucket for snow removal



72″ Ditch Cleaning Bucket



47″ Pavement Removing Bucket



8′0″ Blade—furnished with plain and serrated cutting edges

32″ Digging Bucket; 36″ Digging Bucket

Pavement Ripper

GRADALL DOES ALL THESE JOBS WITH EASE AND PRECISION

- Trench Digging
- Highway Widening
- Basement Excavating
- Ripping and Loading Old Pavement
- Ditch Cleaning
- Sloping and Grading
- Back Filling
- Snow Removal and Loading

GRADALL

DOES THINGS *One Machine* NEVER DID BEFORE!

NOW—AFTER 5 YEARS OF RIGID FIELD TESTING—the Gradall is here—ready for construction men everywhere who have demanded *one machine* that can do the work of *many*.

An amazing new principle in construction machine design enables Gradall to handle a wide variety of jobs, both on and off the highway, with a precision never before seen in construction work.

GRADALL VERSATILITY in many cases eliminates the need for investing in different types of costly machinery. Gradall comes mounted on a heavy-duty chassis that can be driven from job to job at truck speed—expense of hauling several kinds of heavy equipment is avoided.

GRADALL DEXTERITY permits working right up to walls and curbs, around poles, under low-hanging trees and wires. Hydraulic power gives "Arm Action" to the telescopic boom—enables it to reach and pull, swing and tilt for fast work in close quarters.

GRADALL PRECISION results in sheer, clean-cut walls or perfectly graded slopes—produces neat, finished jobs to eliminate or greatly reduce costly clean-up hand labor.

ENGINEERED AND BUILT BY MAKERS OF PRECISION MACHINERY, Gradall was first developed by a contractor to fill practical construction needs. Gradalls are being produced as fast as possible to satisfy a growing demand from contractors and street and highway departments.

SALES AND SERVICE:

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

BAY EQUIPMENT CO.
3254 East Shore Highway
Richmond, California

GRADALL DIVISION
WARNER & SWASEY
Cleveland

Gradall Reg. U. S. Pat. Off.

SEND FOR BOOKLET

WARNER & SWASEY
Cleveland 3, Ohio

Please send the new GRADALL Book to:

Name .....

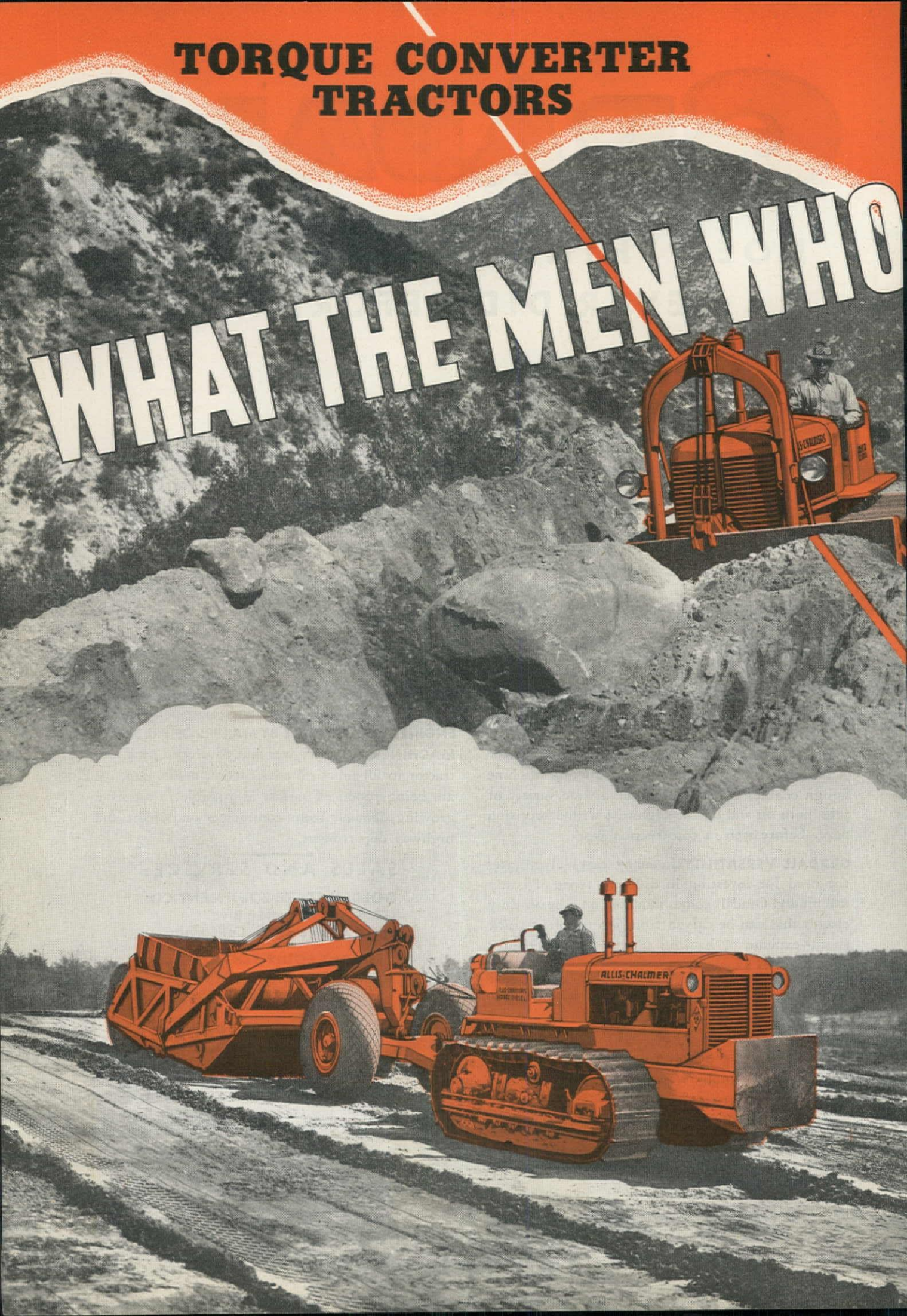
Address .....

City ..... *State* .....

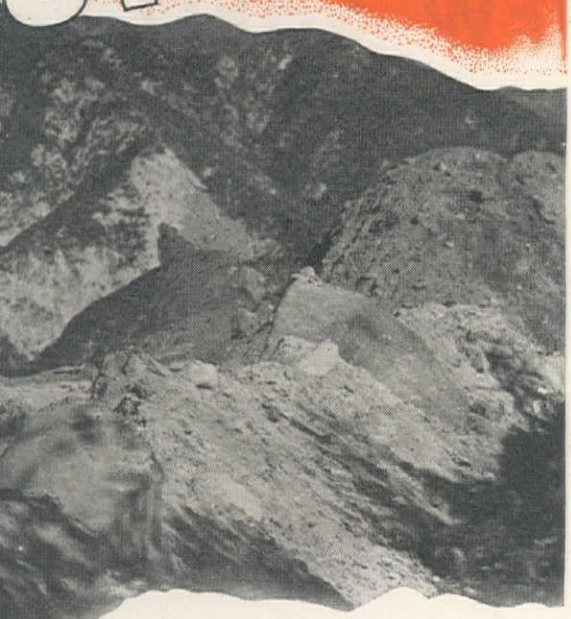
J-547

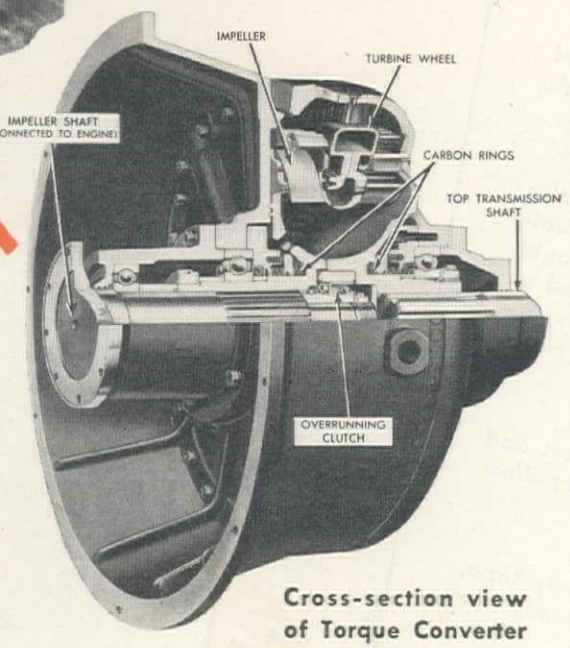
TORQUE CONVERTER TRACTORS

WHAT THE MEN WHO



OWN THEM SAY...





Cross-section view of Torque Converter

WESTERN OWNERS

"Not interested in any tractor that does not have Torque Converter."

JOHN IBEN, Phoenix, Arizona

"Easier and smoother operation. Less breakage of either pulled or pushed machinery or cable. Use two units—pull scrapers, land planes and rippers, clearing and leveling desert land."

HANSON FARMS, Casa Grade, Arizona

NORTHWEST OWNERS

"Get one-third more production and smoother performance than with conventional tractor. Less operator fatigue."

WIRKHALA BROS., Naselle, Wash.

SOUTHWEST OWNERS

"Torque Converter Tractor is finest bulldozer tractor ever built. We also use a Torque Converter tractor with a scraper and haul more dirt faster and cheaper because of time saved shifting gears. Low upkeep on tractors and auxiliary equipment."

OLENE HANSON, Houston, Texas

"Never had a tractor which moves dirt as quickly and cheaply as a Torque Converter. Got 3,000 hours on my first one and no trouble yet. Now own three."

STORMS CONSTRUCTION CO., Pampa, Texas

MIDWEST OWNERS

"Tried, tested, proved! First Torque Converter Tractor led to purchase of seven additional units. More on order.

S. A. HEALY CO., Chicago, Illinois

"Have 12,000 hours on our Torque Converter Tractor and it is still in good condition. Has moved many thousands of yards of dirt with minimum repair cost."

DE RUYTER BROTHERS, Willmar, Minn.

"Less shifting feature is appreciated by operator. Steering clutches last longer. Tractor requires less servicing because shock is absorbed."

JOHN DEHNER, Fort Wayne, Indiana

"Ability to constantly increase motor power without 'clutching' cannot help but reduce to no small extent, the wear and tear on transmission and drive."

SCHUERMANN BUILDING & REALTY CO., St. Louis, Mo.

EASTERN OWNER

"Moves 20 percent more yardage, yet upkeep cost is about half that of conventional tractors."

MILLS, GORMAN AND McALLISTER, Wendell, West Virginia

Like these users, you can lower cost, step up yardage moved with Allis-Chalmers Torque Converter Tractors. Here is "get up and go" performance with less gear-shifting. Operation is continuously smooth — starting, pushing, pulling. This all adds up to more work done, less maintenance, MORE PROFIT! Now is the time to investigate.

ALLIS-CHALMERS

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

2-CYCLE DIESEL ENGINE

4-CYCLE DIESEL ENGINE

GASOLINE ENGINE

IF YOU COULD HAVE BEEN THERE WHEN WE TORE DOWN THESE TEST ENGINES* YOU'D KNOW WHY WE CALL NEW SHELL TAL the finest Heavy Duty

TALONA SETS A RECORD IN A 2-CYCLE DIESEL

Wide open throttle in this high speed Diesel. Hour after hour! Day after day! Engineers keeping hourly data on new Talona's performance could hardly believe their own charts.

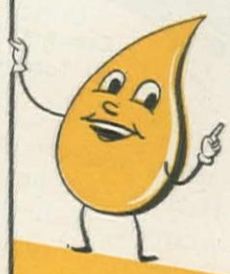
1 Blower pressure, indicating air volume through intake ports, remained constant the full length of this grueling run. Hard carbon forming in the ports would have increased the pressure. Power output stayed at 100% throughout. *Rarely, if ever before, has this oil-punishing test been made without having to clean carbon from the ports during the run.*

2 One oil filter served throughout the entire test and was functioning efficiently at the end. *Test rules allow four filters to be used.*

3 Fuel consumption, carefully charted the whole time, *actually was lower at the end of the run than at the beginning.*

4 Engine condition (thoroughly checked for wear, for deposits of sludge, carbon and lacquers, for bearing corrosion and for fit of piston assembly) showed no distress anywhere. From *all* indications, this engine could have run another such test at peak efficiency.

*In all, four different engines were used in proving this new oil. Test specifications—drawn by an impartial group of top-flight engineers—are the stiffest in use today. Talona passed every rigorous test by so wide a margin that it finished in a class by itself. More exacting tests must be found to measure the truly unusual values in new Shell Talona Oil



ONA
Oil ever developed

Here's an entirely new kind of heavy duty Diesel lubricating oil . . . non-corrosive . . . with unheard-of resistance to the "inside" causes of oil breakdown and reduced engine life

Product of nine years search, new-formula Shell Talona Oil contains four secret ingredients. These additives fortify it against formation of acids, lacquers, carbon and sludge. Tests have proved that Talona resists deterioration and reduces engine wear to a degree hitherto thought impossible.

UNHEARD-OF RESULTS WITH NEW TALONA

In the most grueling tests in use today Talona kept sludge to a harmless minimum; protected copper-lead alloy bearings from any trace of corrosion; kept pistons and rings virtually free of carbon and lacquer deposits. As for wear resistance — imagine this: after one of the longest and most severe test runs, wear to pistons and cylinder walls was actually too small to be measured by ordinary standards. Piston rings still showed original tool marks!

WHAT TALONA MEANS TO YOU

Because Talona is *by far the best lubricant protection yet found against wear and other enemies of engine life,* it belongs in your high speed Diesel and heavy duty gasoline engines. Talona will help such engines operate longer at sustained efficiency. Fuel economy should improve. And with good care of air cleaners and oil filters, periods between overhauls should be lengthened.

Ask your Shell man today for Talona Oil. It's on sale now — and there's absolutely no other like it. Shell Oil Company, *Incorporated.*

New **SHELL TALONA OIL**

SHELL ®

For any application in the 84 to 275 hp range, there is a proved Cummins Dependable Diesel that will maintain higher average output over a wide variety of changing load conditions.

CUMMINS *Dependable* DIESELS
SINCE 1919...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA

CONFIDENCE...how much is it worth?

IN 1846, twenty three years before the Golden Spike was driven at Ogden, Utah marking the completion of the first transcontinental railway, John August Roebling built America's first truly practical, wire rope suspension bridge. This bridge, which carried traffic across the Monongahela River for scores of years, stood as a silent testimonial to his confidence in a principle of bridge building which, in that day, was looked upon with considerable misgiving.

How much is this confidence worth to bridge engineers, and to humanity as a whole, today?

Had it not been for his confidence there would have been no Brooklyn, George Washington nor Golden Gate Bridges. Had it not been for your confidence in the company that bears this pioneer's name, there could have been no John A. Roebling's Sons Company.

Your confidence is valued above all of this company's assets. Every Roebling employee's job depends upon his ability to preserve that confidence by producing better products and by giving you better service than you can find elsewhere.

Any product is only as good as the organization that makes it.

For the Right Rope for Your Equipment Choose a "Blue Center" Steel Wire Rope!

It's easy to find the right wire rope for your job when you can choose from a wide range—the one construction, size, and grade of steel that will give you most service at lowest cost.

That's why, whatever you need in wire rope, you're sure of finding it in Roebling's *complete* line of "Blue Center" Steel Wire Rope, in either preformed or non-preformed types. Illustrated are just a few of the more commonly used constructions. Each is the finest we know how to make . . . and each is made of Roebling's famous "Blue Center" Steel.

Your Roebling Field Engineer has the broad knowledge and experience needed to help you select the wire rope that will give you greatest returns in dependable, low-cost performance. He's at your service. Call him at our nearest branch office.

6 x 19 Standard Hoisting Rope

8 x 19 Extra Flexible Hoisting Rope

6 x 19 Haulage Rope

6 x 30 Flattened Strand Rope

6 x 7 Standard Coarse Laid Rope

18 x 7 Non-Rotating Hoisting Rope

JOHN A. ROEBLING'S SONS COMPANY
OF CALIFORNIA

San Francisco • Los Angeles • Seattle • Portland

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

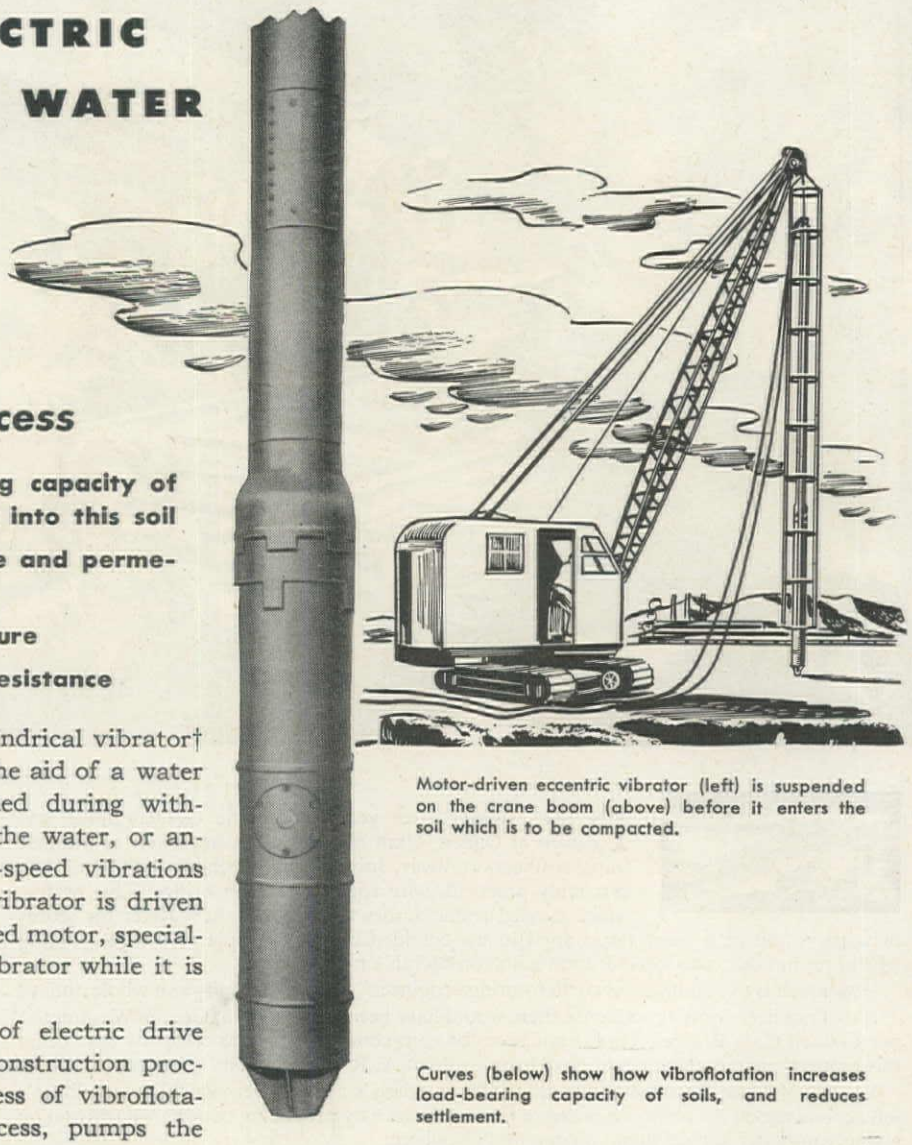
ROEBLING

A CENTURY OF CONFIDENCE

JAR ROEBLING

VIBROFLOTATION

MODERN METHOD OF SANDY SOIL COMPACTION EMPLOYS ELECTRIC VIBRATOR AND WATER



Motor-driven eccentric vibrator (left) is suspended on the crane boom (above) before it enters the soil which is to be compacted.

This New Process*

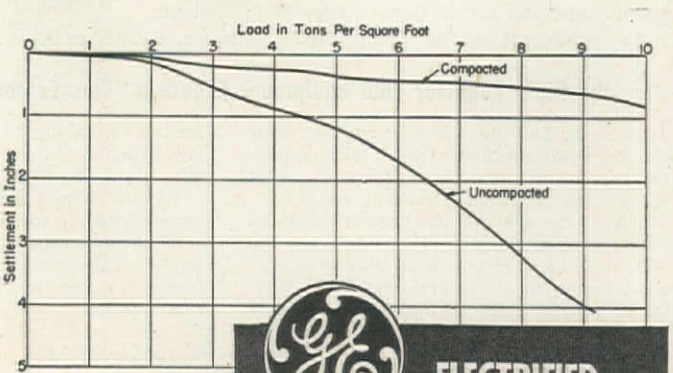
- **Increases the load-bearing capacity of soils, and of piles driven into this soil**
- **Diminishes the void volume and permeability of soils**
- **Diminishes active soil pressure**
- **Increases the passive soil resistance**

Vibroflotation uses a vertical, cylindrical vibrator† which "sinks" into the earth with the aid of a water jet; compaction being accomplished during withdrawal by the combined action of the water, or another suitable liquid, and the high-speed vibrations which tamp the soil particles. The vibrator is driven by a General Electric totally enclosed motor, specially designed to operate within the vibrator while it is submerged in wet sand.

The same inherent advantages of electric drive which have made possible many construction processes also contributed to the success of vibroflotation. Electricity controls the process, pumps the water, and drives the vibrator by flexible cable throughout the length of its vertical travel.

If you are contemplating electrification of your construction equipment, consult your General Electric representative for first-hand information on recent electrical developments which will help you build a more economical, safer construction tool. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

Curves (below) show how vibroflotation increases load-bearing capacity of soils, and reduces settlement.



* **Vibroflotation was introduced in this country recently by Parsons, Brinckerhoff, Hogan and Macdonald, consulting engineers; and Merritt-Chapman and Scott, general contractors.**

† **Built by Baldwin Locomotive Works.**

GENERAL ELECTRIC

655-58-162

ELECTRIFIED CONSTRUCTION

BETTER PRODUCT ★ LOWER COST

Barber-Greene

FIRST! because they LAST!

The on-the-job lasting ability that identifies B-G Standardized Belt Conveyors is in large part due to these B-G all-welded tubular steel belt carriers. Protected from dust and grit by "four-pass" grease seals, their bearings—roller, ball or plain as the job requires—keep them rolling smoothly with minimum maintenance.

Heavy die-formed support brackets are welded to the self-cleaning base. And along with Barber-Greene sturdiness, B-G Belt Conveyors bring you the advantages of standardized design: selection of the right one for the job and erection on the job are simplified. See your Barber-Greene distributor or write Barber-Greene Company, Aurora, Illinois.

BARBER-GREENE COMPANY · AURORA, ILLINOIS

Constant Flow Equipment

LOADERS PERMANENT CONVEYORS PORTABLE CONVEYORS COAL MACHINES BITUMINOUS PLANTS FINISHERS DITCHERS

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

REALIGNING A RAILROAD BED —Through TOUGH Glacial Deposits

FOLEY BROTHERS INC., ST. PAUL AND MARSCH-PETERSON CO., OMAHA; RR CONTRACT WESTERN NORTH DAKOTA.

—with a fleet of Wooldridge Terra-Cobras

WOOLDRIDGE TERRA-COBRAS employ the same Bowl features as Wooldridge "Terra-Clipper" tractor-drawn Scrapers

Across 16.6 miles of North Dakota's ruggedest terrain, a new roadbed for the Northern Pacific Railway has been carved through lignite and hard vitrified scoria. A sizable portion of the 3,750,000 cubic yards of glacial deposit was handled by a fleet of nine Wooldridge high-speed, heavy-duty Terra-Cobras. These units were frequently given the toughest assignments in the hardest cuts. Compaction was effected by routing the heavily loaded units over varied portions of the haul road and fill. To keep your earth costs down to rock bottom, investigate Wooldridge Terra-Cobras, today.

Measure Each Job in terms of WOOLDRIDGE EQUIPMENT:

- ★ High Speed EARTHMOVERS
- ★ Tractor-drawn SCRAPERS
- ★ BULLDOZERS
- ★ TRAILBUILDERS
- ★ RIPPERS
- ★ POWER CONTROLS

WOOLDRIDGE

TERRA COBRA

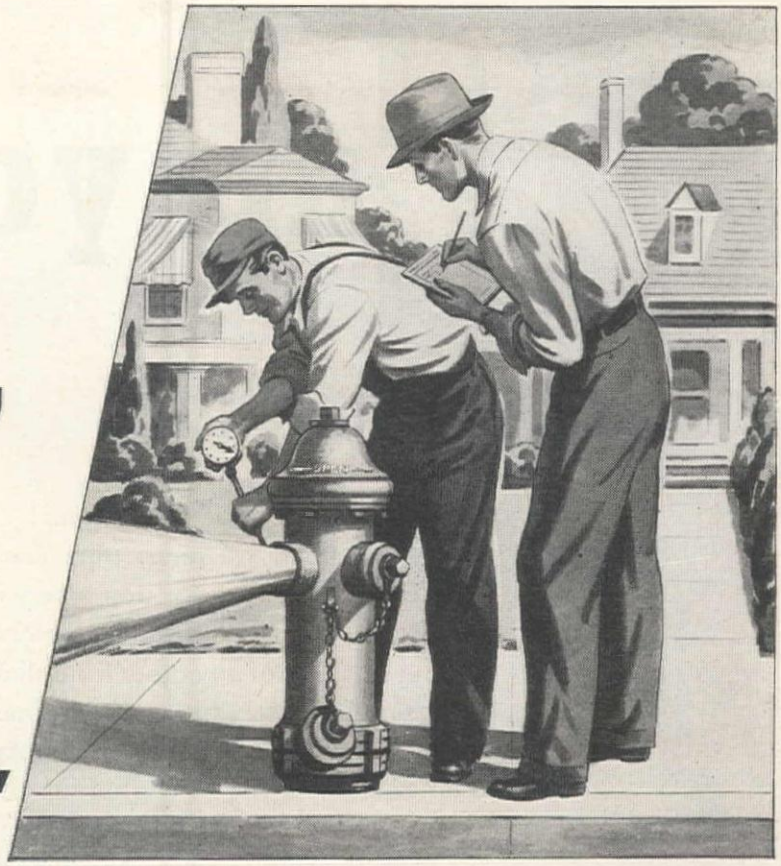
HIGH SPEED-SELF PROPELLED

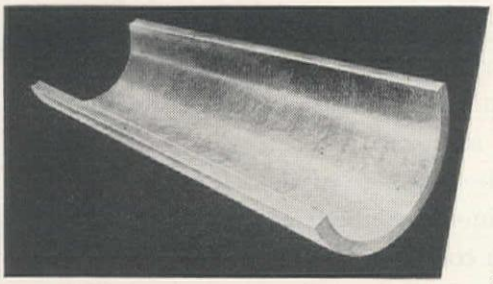
EARTHMOVERS

WOOLDRIDGE MANUFACTURING CO.
SUNNYVALE, CALIFORNIA
NATIONWIDE SERVICE

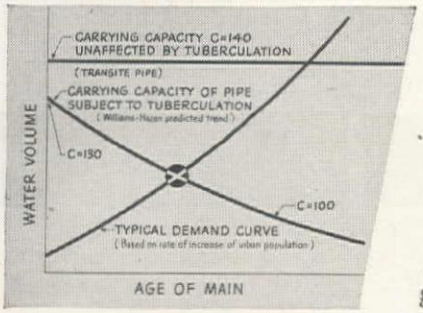
"Plenty of 'fire-flow' here!"

...says the Testing Crew





Transite's smooth interior is permanently unaffected by the destructive effects of tuberculation. Its high carrying capacity *stays high.*



This chart shows that, although water demand continually increases, the carrying capacity of water mains subject to tuberculation progressively decreases. Note the much longer period during which a Transite line, represented by the straight curve, continues to meet demands.

TESTS such as those made periodically by the fire insurance underwriters emphasize the fact that the most effective fire protection is provided by the water pipe with a *maintained* high carrying capacity.

Transite Pressure Pipe has this important advantage. It has an unusually high flow coefficient (C=140) . . . a coefficient which stays high because Transite, being made of asbestos and cement, is completely immune to tuberculation. This troublesome form of internal corrosion can never reduce Transite's initial high carrying capacity.

This means that a Transite water line helps assure the required flow of water for fire-fighting needs. It means that pumping costs can be held to a minimum. And it means that taxpayers can receive the benefits of the favorable fire insurance rates which result from a modern, efficient water distribution system.

The assurance of a maintained high carrying capacity is one of many reasons why it will pay you to investigate Transite Pressure Pipe when you plan water works improvements. Transite's proved resistance to corrosive soils . . . its tight, flexible joints that safeguard against underground leakage . . . its maintained strength and continued low maintenance are other advantages you will want to know more about in connection with your water works projects.

To get all the facts write for brochure TR-11A. Address Johns-Manville, Box 290, New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

Transite Pressure Pipe

An Asbestos Product

Can you think

There's a fortune in it if you can.

But remember, we mean pipe material that *will* serve for centuries. Everybody knows that cast iron pipe will because it *has* served for a century in American cities, and for more than two centuries in Europe.

Can you think of any other kind that will? Under the ground and under pressure? At practicable cost? No one else has been able to.

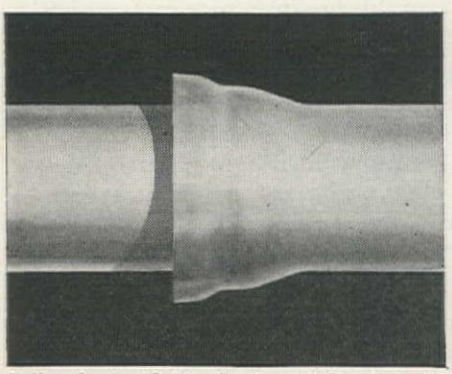
But, you may say, in this Atomic Age why should I buy pipe that lasts so long? Because the same qualities that enable cast iron pipe to serve for centuries also mean economy "in our time." Lower annual maintenance cost from the start. Lowest cost per service year in the end.

A survey among 195 waterworks superintendents proves that the maintenance cost of cast iron pipe for distribution mains is lowest by far.

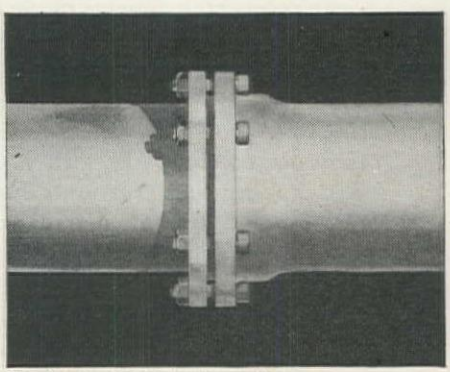
Engineers, in evaluating bids, continue to give cast iron pipe the highest rating for useful life—100 years or more.

A U. S. Government Report On Obsolescence gives cast iron pipe the lowest rate of depreciation of all engineering materials.

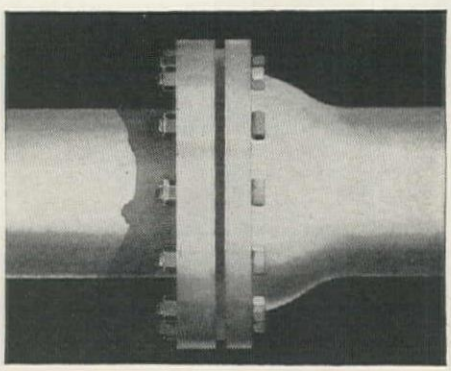
Yes, you can lay cast iron pipe with confidence, underground or under water. Because of its all-purpose adaptability, cast iron pipe is available with joints for every service as shown below. Cast Iron Pipe Research Association, T. F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3.



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



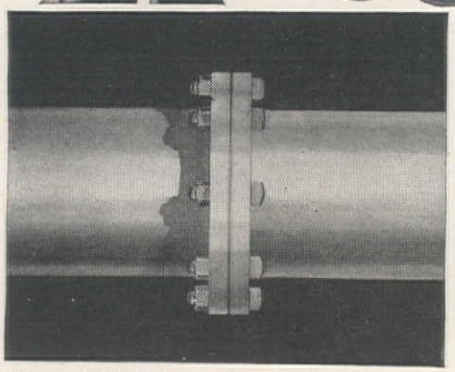
Mechanical Joint—for all pressures—now standardized with interchangeable parts.



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

CAST IRON PIPE

of any other pressure pipe material, practicable for underground mains, that will serve for a century?



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

Serves for Centuries

A new era in lubrication...

T5X

THE SENSATIONAL PURPLE OIL!

For the first time since its wartime development, T5X—the sensational new purple oil for gasoline, Diesel, natural gas, and butane-powered engines—is available in quantity. T5X is a fully compounded, detergent-type oil. Its distinctive color comes from an exclusive ingredient which helps give the oil its remarkable stability.

Just how good is T5X?
Take a look at these test results!

DIESEL TESTS—T5X easily passed the grueling 500-hour continuous-run test in a high-speed automotive-type Diesel engine operating at 2000 r.p.m. and maximum load . . . considered the most exacting test of all for Diesel lubricants!

GASOLINE ENGINE TESTS—In the "L-4" Coordinating Research Council designation tests for gasoline engine lubricants, T5X lasted *double* the length of time required for top lubricating performance!

Recommended uses

T5X is so high in quality, so versatile in its uses, that it will give outstanding protection and performance in any kind of gasoline, Diesel, natural gas or butane-powered engine in *any* industrial operation. T5X performance has been praised by literally thousands of engineers, farmers, shop foremen, maintenance men, etc.

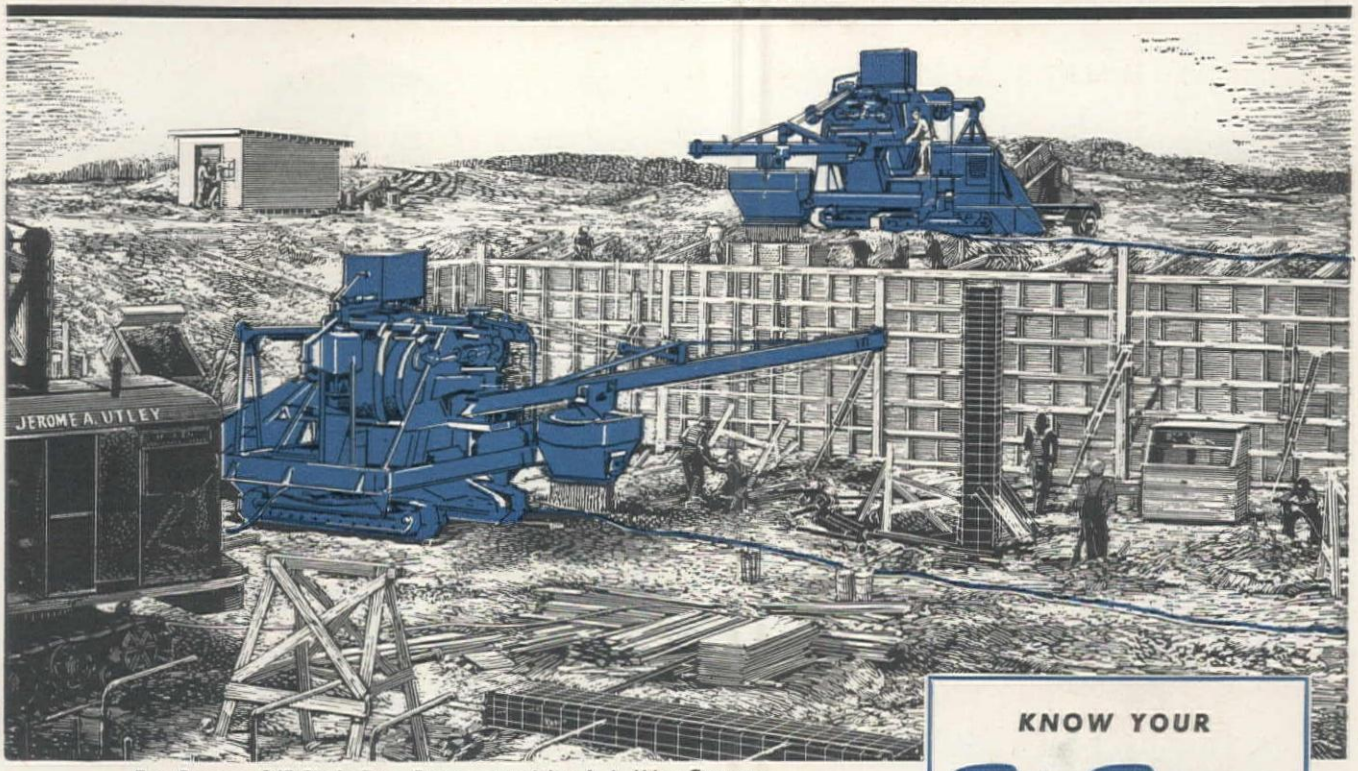
Phone your local Union Oil Representative or wire Sales Dept., Union Oil Company, Los Angeles 14, California, for full information on T5X—the sensational *purple* oil.

T5X—"as distinctive in quality as it is in color"

UNION OIL COMPANY

OF CALIFORNIA

TO BEAT YOUR ESTIMATE WHEN THE GOING GETS TOUGH



Two Ransome 34E Single Drum Pavers, owned by J. A. Utley Company, Michigan contractor, delivering concrete directly into forms

Concrete for this big Michigan auto factory site was batched at a central mixing plant. Ground conditions kept truck mixers from getting close to the forms. Bridging the gap with crane-carried buckets would have shot costs up far beyond the estimate. So . . .

Ransome Blue Brute Pavers were called in. From well back of the excavated dirt mounds their "live booms" swung their hydraulically-controlled buckets directly over the forms. Spillage was eliminated by the bucket's hydraulic shut-off when the forms were filled . . . Another construction problem solved!

More About the "Live Boom"

It spreads over a wider area with every swing, eliminating hand shovelling . . . Boom can be elevated to 9-ft. clearance under bucket, while paver concretes retaining walls, etc., and lays the slab — all in one operation. *Only Ransome Pavers include the "live boom" as standard equipment.*

Get the Whole Story

Many other advanced features show why 34E's — Single Drum and Dual Drum — are preferred equipment on big construction jobs . . . highways, dams, reservoirs, airport runways, foundations, piers . . . saving costs with every cubic foot of concrete placed. Write for facts on how these famous Ransome Pavers can make more profits for you with their high-speed operation and their low maintenance cost . . . proving *there's more worth in a Blue Brute.* R7-5

KNOW YOUR

BLUE BRUTES

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

RANSOME EQUIPMENT

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

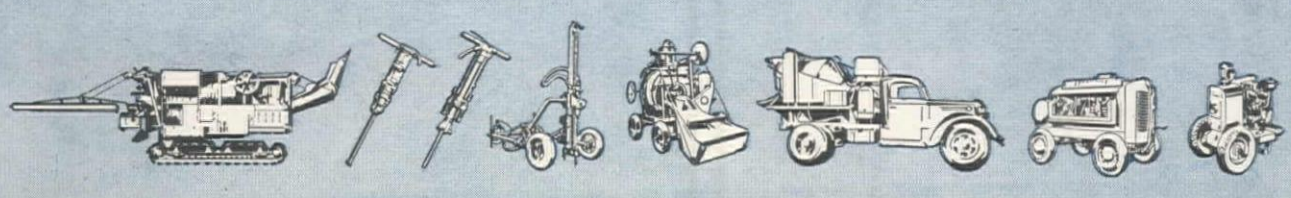
WORTHINGTON EQUIPMENT

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

WORTHINGTON

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

BUY BLUE BRUTES



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

This hot-ladle crane cost more than $100,000 . . . but as it is it couldn't work!

You don't use this sort of equipment in construction, but it affords a splendid example of where false economy might be extremely costly.

This gigantic, 100-ton, ladle crane cost well over $100,000—but it couldn't pour a drop of molten metal without wire rope. That's what's missing in this picture. How much does wire rope cost? Ordinary wire rope—about $1500. The superior wire rope—Preformed Improved Plow Steel—about $1800.

Be safe. Be sure. Don't let penny wisdom keep you from having the best. Specify Preformed of Improved Plow Steel for your next rope. And when you buy a machine—any machine—make certain it is equipped with Preformed. You will like it because it lasts longer. Your workmen will like it because it is easier and safer to handle.

WRITE FOR FREE COPY of helpful book about Preformed. Address: Preformed Wire Rope Information Bureau, 520 North Michigan Avenue, Chicago 11.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

HANDLES EASIER - LASTS LONGER

Get 25% MORE CRUSHING AREA

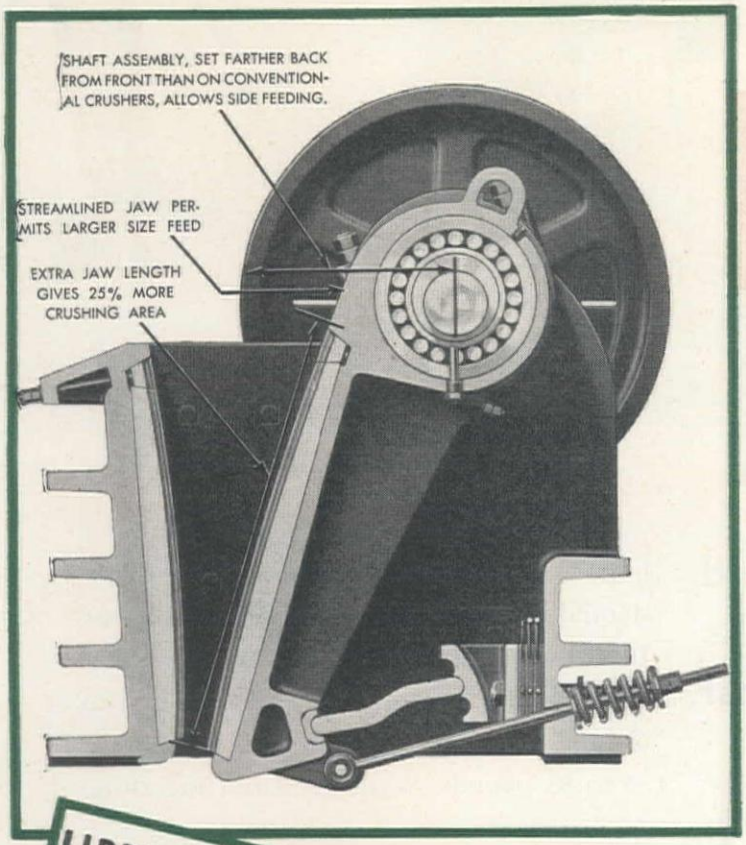
with LIPPMANN HEAVY DUTY ALLOY JAW CRUSHERS!

Check This Table. See for Yourself Why You Get More for Your Money . . . with the Lippmann Heavy Duty *Alloy* Steel Jaw Crusher!

COMPARISON OF JAW LENGTH (IN.)

Crusher Size	15 x 36	18 x 36	24 x 36
Other Crushers	34.5(1)	40.67(2)	54.67(3)
LIPPMANN Heavy-Duty	45	51	66
% Extra Area with LIPPMANN	30.4	25.4	20.7

(1) Average of 8, (2) average of 3, (3) average of 3. (Only comparable sizes listed in Powers' Roads & Streets Catalog.)



WHEN you buy the new, post-war Lippmann Heavy Duty Jaw Crusher, you get more crusher for your money, based on crushing area alone.

That extra 25% means wider range of product sizes available, finer settings, reduced need for additional processing. Coupled with force-down feed, it adds up to increased output for you. And that extra jaw length gives greater nip, prevents round rocks from "pinching" out, lessens possibility of large rocks' clogging crushing chamber with consequent costly shutdowns.

Remember, too, the Lippmann Heavy Duty Jaw Crusher is *designed* to take advantage of alloy steel's great structural strength. The *alloy* steel frame, jaw and bearing caps, plus forged *alloy* steel shaft, give you a rugged, high capacity crusher. *No Lippmann crusher, with proper maintenance, has ever had a shaft or bearing failure!*

These engineering extras in the Heavy Duty Jaw Crusher are typical of the added values you get with all Lippmann equipment. Whenever you need any of the products listed below, get in touch with the Lippmann distributor near you. Or write direct to Lippmann Engineering Works, 4603 West Mitchell Street, Milwaukee 14, Wisconsin.

LIPPMANN ENGINEERING PRODUCTS for PITS, MINES, QUARRIES

- Jaw and Roll Crushers
- Pulverizers
- Vibrating and Rotary Screens
- Loaders and Conveyors
- Scrubbers and Washers
- Hoppers and Bins
- Portable Washing Plants
- Self-Propelled Crushing Plants

Distributed by

BALZER MACHINERY COMPANY, Portland
F. J. BALZER COMPANY, Seattle
N. E. OTTERSON COMPANY, San Francisco

LIPPMANN

Knock down and drag out

...powerful Le Roi-Cleveland Paving Breakers get jobs done in a hurry at low cost

Wallop — that is the secret of Le Roi-Cleveland Paving Breaker success — that is why these machines save time regardless of the material being broken.

All this power stays on the job, too, giving dependable performance day in and day out. Front head parts are protected—they receive no shock from the piston blows so that upkeep costs are unusually low.

Equip your crews with Le Roi-Cleveland Paving Breakers. Knock out the work in a hurry. Enjoy the benefits that result from substantial savings in time and money. Ask your Le Roi distributor to show you all the features that make these paving breakers easy to use and economical to own. Sizes range from 35 to 83 pounds. Write for latest literature.

*Reg. U. S. Pat. Off.

Le Roi 105 Tractair* | *Le Roi* Heavy-duty engine | *Le Roi* Engine-generator set | *Le Roi* Airmaster*

LE ROI COMPANY

CLEVELAND DIVISION
Manufacturers of Cleveland Rock Drills
Cleveland 11, Ohio

LE ROI COMPANY, General Offices, Milwaukee 14, Wisconsin

NEW YORK • WASHINGTON • CLEVELAND • MILWAUKEE
BIRMINGHAM • TULSA • BUTTE • SAN FRANCISCO

RD-3

Walking dragline operating on the Friant-Kern Canal project. The 5 cu yd bucket weighs 30,000 lbs loaded. Bethlehem 1½-in Form-Set drag lines and 1⅛-in. hoist lines are used on this equipment.

In the construction of the Friant-Kern Canal Bethlehem Form-Set Wire Ropes are used on both the walking dragline and the scraper wagons operated by Peter Kiewit Sons' Company.

Their large diesel-powered dragline moves 5 cu yd of blasted blue granite at a bite. Bethlehem Form-Set ropes drag the bucket through this highly abrasive rock and hoist the loads for dumping.

Their modern tractor-drawn scraper wagons carry earth from the canal floor, 12 cu yd at a load. Each of these machines is rigged with six separate sets of Bethlehem Rope of various sizes.

To handle these tough jobs a rope has to be more than ordinary wire laid into ordinary strands. It has to be made of carefully controlled steel drawn into highly uniform wire, then laid into rope of the correct construction. In the manufacture of Bethlehem Rope each of these steps is closely supervised by experienced rope engineers and metallurgists. That is the reason why Bethlehem Ropes are standard equipment on earth-moving machinery operated by many successful Western contractors.

The next time you need rope replacements for any type of equipment, remember to ask your distributor for the Bethlehem brand.

Scraper wagons grading the canal floor. Bethlehem Form-Set Wire Rope is used to rig these machines.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Salt Lake City, Honolulu

Steel Plants: Los Angeles, South San Francisco, Seattle

BETHLEHEM PACIFIC

BETHLEHEM STEEL

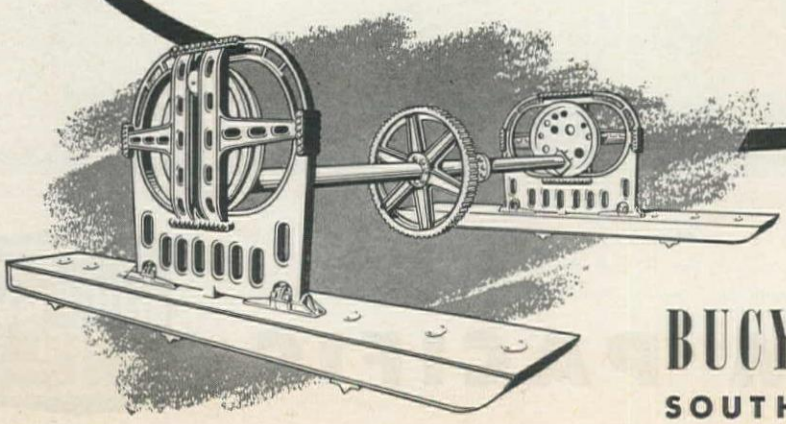
WHERE OTHER MACHINES CAN'T HOPE TO TREAD...

Bucyrus Walkers Are Moving Dirt

All over the world, Bucyrus-Erie walking draglines are handling jobs that machines with other types of mounting can't undertake because of the ground conditions prevailing. Bucyrus-Eries are sure-footed and safe even in precarious places. They can walk where you want them, when you want them — waste no time in getting from one digging position to the next, work close to the edge of steep banks for extra range.

Bucyrus-Erie design provides the needed stability — in both digging and walking. The large circular base provides a working foundation whose rim pressures are always safely low because shifts of the center of gravity are never permitted to go beyond predetermined limits. The big walking shoes grip the ground firmly, and the simple rolling cam walking action provides a motion that cushions the machine down at each step.

25M47



Booms: 110 to 250 ft.
Buckets: 4 cu. yd. to 25 cu. yd.

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

STANDARD ENGINEER'S REPORT

RPM CALOL

TEST DATA

UNIT G.M.C. Diesel 6-71 # Bus engine 6711367

LUBRICANT (RPM Delo oil SAE 20 and

~~FUEL~~ (RPM Heavy Duty motor oil SAE 30

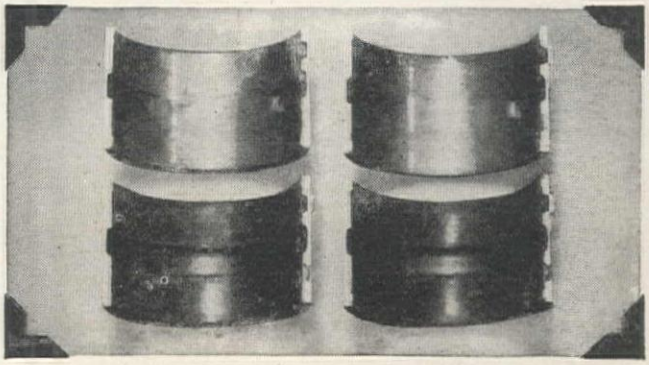
MILES RUN 234,539

FIRM L.A. Motor Coach Lines

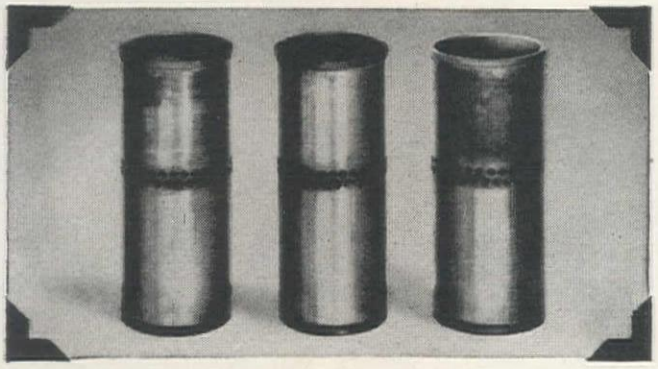
LOCATION Los Angeles

DIESEL BUS ENGINE RUNS 234,539 MILES ON RPM OILS WITHOUT REPLACEMENT OF ANY PARTS

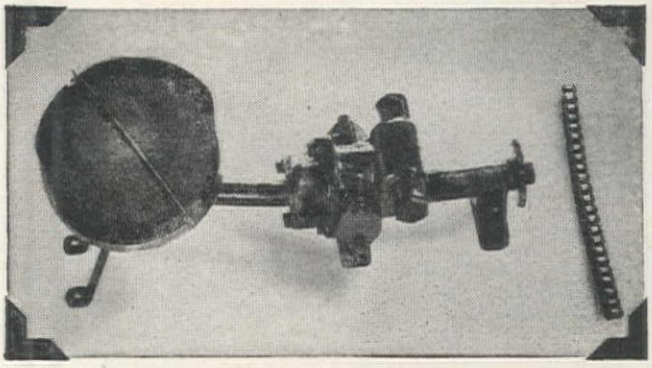
These pistons and pins came from a bus engine operated in city service for 234,539 miles on RPM Oils. As this photograph shows, they were unscratched and rings generally free. RPM Oils keep parts clean.



No cracks, pits or scoring appeared on main or connecting rod bearings. The highest wear measurement on any con rod journal was .0008"; on any main journal .0012". RPM Oils are non-corrosive.



All cylinders were smooth and varnish-free. Measurements on each showed wear from none to only .0035" near top of No. 4. No. 1 was .0013" out of round. RPM Oils stick on parts running or idle.

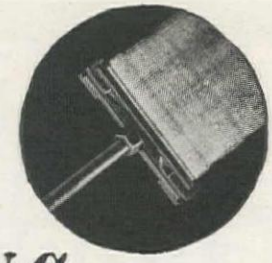


The oil-pump screen was clear of sludge and other foreign matter. RPM Oils are highly oxidation-resistant. Any sludge or loosened varnish and lacquer stay suspended and drain out with the oils.

REMARKS: The test on RPM Oils ended at 234,539 miles without bearing failure or piston seizure. (The longest run on any other oil before failure was 177,000 miles.)

RPM DELO Diesel Engine Lubricating Oil SAE 20 was used for the first 66,000 miles of the test, RPM Heavy Duty Motor Oil SAE 30 for the last 168,539 miles. Both of these oils contain special compounds which clean varnish, lacquer and sludge from engine parts, prevent corrosion, resist oxidation and keep lubricant on hot and cold spots alike.

STANDARD OF CALIFORNIA



FLAME-PRIMING smooths

Flame-priming is a fast, easy, inexpensive way to prepare any metal surface for a smooth, lasting paint coat.

LINDE OXYGEN • UNION CARBIDE PREST-O-LITE ACETYLENE • OXWELD, PUROX, PREST-O-WELD, HELIARC, UNIONMELT EQUIPMENT FOR WELDING, CUTTING, AND HEATING

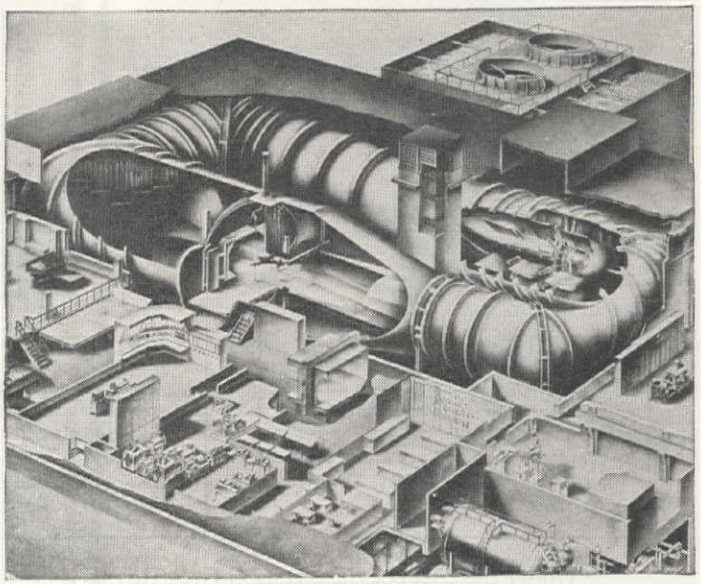
the way for the "Big Blow"

A typhoon is just a puff compared with the wind that whips through this test tube for model airplanes at Cornell Aeronautical Laboratory, Buffalo, N. Y. The "big blow" is created by two 22-foot diameter fans that can generate a wind of over 700 miles per hour.

The inside walls must be smooth, scale free, since this gargantuan blast would shear off any little specks and drive them through a valuable test model plane with devastating force. To prevent this, every little bit of scale was removed from the thousands of square feet of metal surface before painting by Linde's flame-priming process.

Flame-priming is simple to do, requires little equipment, and costs little. A brush of oxy-acetylene flames pops off scale and drives out moisture. Paint applied to the warm, dehydrated surface spreads easily, goes on smoothly, bonds tightly, and lasts longer.

Linde service engineers are always available to help with problems of treating, cutting, joining, and forming metals. Linde research is constantly at work on the development of new and better methods for the production and fabrication of metals.



Two huge 22-foot diameter fans, fabricated by UNIONMELT *welding, generate the wind for high-speed tests simulating high-altitude conditions.*

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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

In Canada: Dominion Oxygen Company, Limited, Toronto

SERVING THROUGH SCIENCE

EXTRA SHOCK PADS

protect this husky trio from costly impact injuries!

U. S. ROYAL *Con-Trak-Tor*

This strong, rugged "mucker" tire has a deep cleated tread, insuring maximum two-way traction. Center running rib assures longer wear, easier steering.

U. S. ROYAL *LOGGER*

Its tough, strong body resists ruptures and impact injuries. Self-cleaning design maintains maximum traction, prevents rock retention. Center running rib adds mileage.

U. S. ROYAL *Fleet Delivery*

Extra long mileage results from the deep, flat, non-skid, slow-wearing tread. Center running rib makes steering easier. Shoulder design resists curb and rut scuffing.

Under the tread of these rugged U. S. Royals there are *two extra* shock pads to guard against sudden impact injuries... to unite the tread and tire body into one resilient unit... to protect against fabric breaks and separations.

Each tire has the *added* strength of exclusive "U. S." Safety Bonded Cord construction . . . and in each the tire body is attached to the steel wire beads by a specially designed bead anchoring that rigidly ties the beads to the tire itself.

When it comes to the *tread*, each is field-designed to *deliver the goods* on the job for which it is built!

FOR EVERY TIRE THERE'S A U. S. ROYAL BUTYL TUBE

UNITED STATES RUBBER COMPANY

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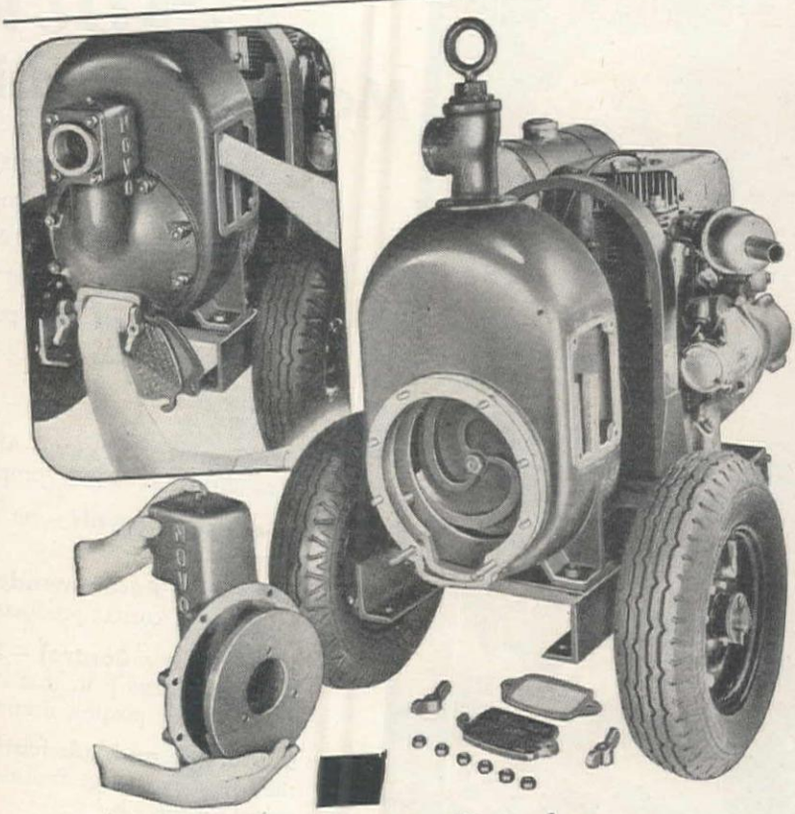
NOVO NEWS

MAY, 1947



You Can Almost Service This Pump Blindfolded!

Servicing a Novo "Pronto-Prime" self-priming centrifugal pump is simple, quick, and easy. It is not necessary to remove the power unit because pump and engine are independent. It is not even necessary to remove the pump case—or disturb the alignment with the engine—because all wearing parts are accessible through convenient openings. Take off the front cover plate and you reach the impeller, wear plate, seal, shaft, and bearings. Or leave the cover plate on and remove the cleanout plate (part of the cover) and you have direct access to the recirculating priming valve.

To check the clearance between impeller and wear plate, take off the hand hold plate on the side. This same opening also enables you to get at the cutoff which is replaceable to provide a ready means of restoring proper clearance with the periphery of the impeller.

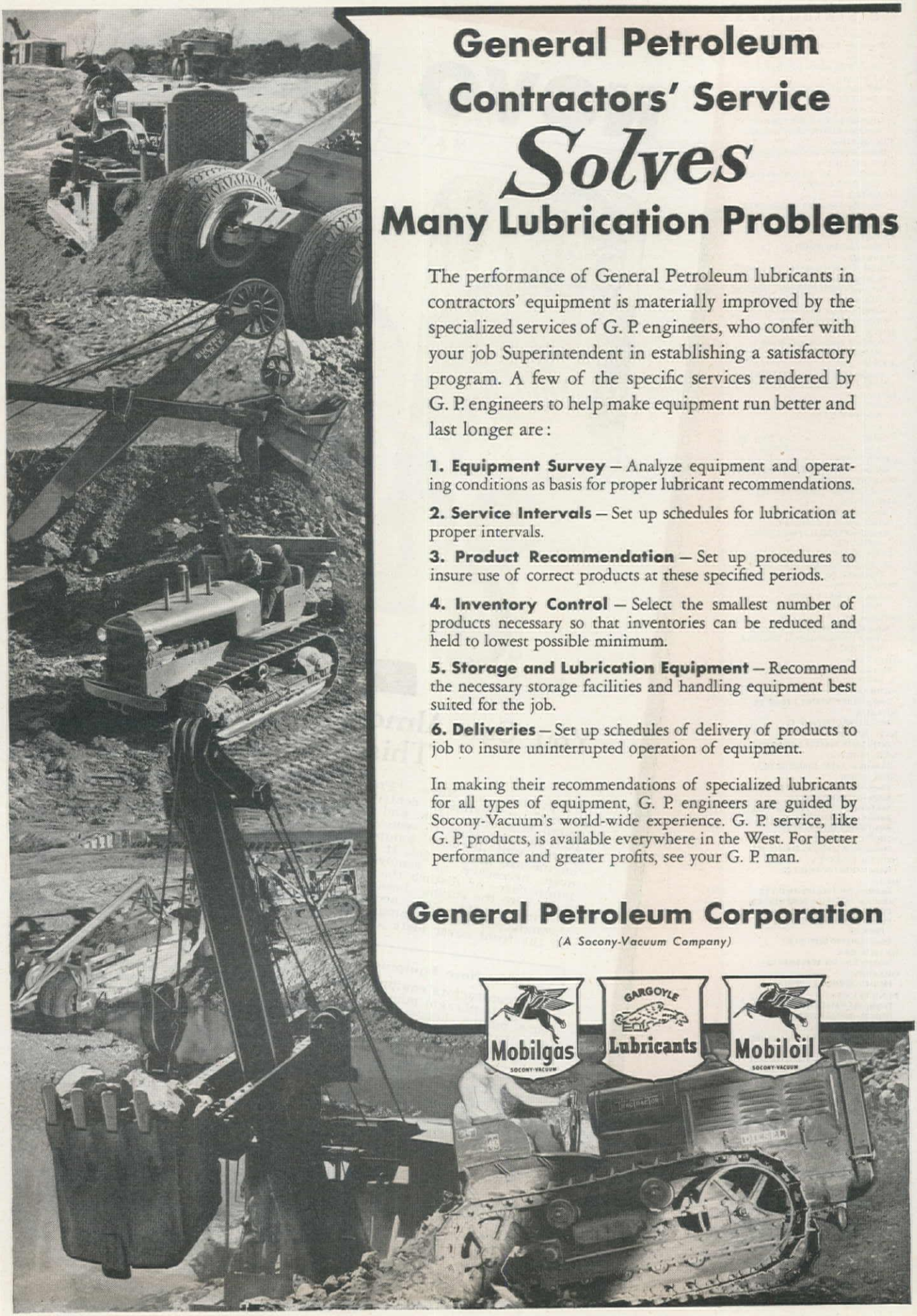
These features—together with the proven performance records of this **new and different** pump—mean less "down-time" and more hours on the job.

Other Novo Equipment

Novo contractors' equipment includes diaphragm pumps, pressure pumps, hoists, generator sets, pavement breakers, traffic line-markers, and engines.

Allied Member of A.E.D.

NOVO
ENGINE COMPANY
LANSING 5, MICH. U.S.A.
CONTRACTOR'S EQUIPMENT
· GRAY IRON CASTINGS ·
ENGINES



General Petroleum Contractors' Service *Solves* Many Lubrication Problems

The performance of General Petroleum lubricants in contractors' equipment is materially improved by the specialized services of G. P. engineers, who confer with your job Superintendent in establishing a satisfactory program. A few of the specific services rendered by G. P. engineers to help make equipment run better and last longer are:

1. Equipment Survey – Analyze equipment and operating conditions as basis for proper lubricant recommendations.

2. Service Intervals – Set up schedules for lubrication at proper intervals.

3. Product Recommendation – Set up procedures to insure use of correct products at these specified periods.

4. Inventory Control – Select the smallest number of products necessary so that inventories can be reduced and held to lowest possible minimum.

5. Storage and Lubrication Equipment – Recommend the necessary storage facilities and handling equipment best suited for the job.

6. Deliveries – Set up schedules of delivery of products to job to insure uninterrupted operation of equipment.

In making their recommendations of specialized lubricants for all types of equipment, G. P. engineers are guided by Socony-Vacuum's world-wide experience. G. P. service, like G. P. products, is available everywhere in the West. For better performance and greater profits, see your G. P. man.

General Petroleum Corporation

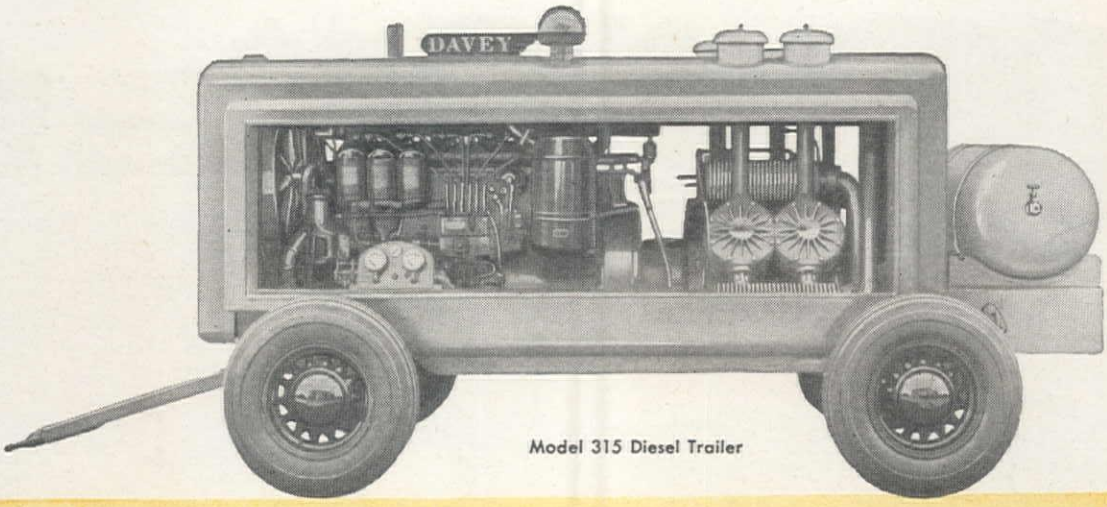
(A Socony-Vacuum Company)

Mobilgas SOCONY-VACUUM

GARGOYLE Lubricants

Mobiloil SOCONY-VACUUM

there's a DAVEY
FOR EVERY COMPRESSED AIR NEED



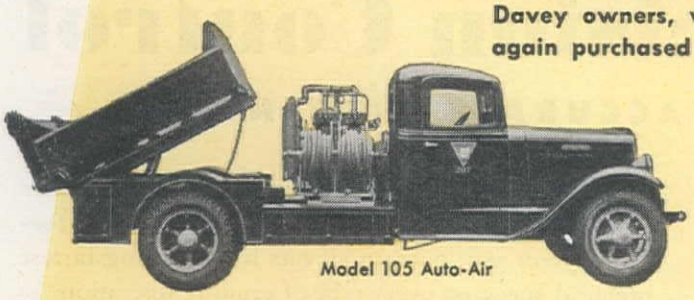
Model 315 Diesel Trailer

Davey Compressors are built for just one class of buyers—those who demand the best!

They're consistently preferred by users who keep careful records of initial cost, operating and maintenance expense . . .

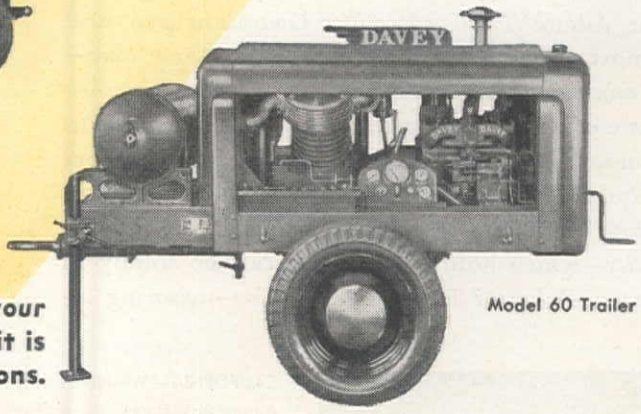
Proof of this preference is found in the five years prior to the war when 97 per cent of the Davey owners, who bought new compressors, again purchased Daveys.

P & P-111



Model 105 Auto-Air

In addition to a complete line of trailer and Auto-Air units (60 to 315 c.f.m. capacities), Davey builds • Mobile Machine Shops • Track-Air Compressors • Departmental (Industrial) Units • Truck Power Take-offs • Mine and Railway Compressors • Power Saws • Portable Lighting Equipment.



Model 60 Trailer

Today is the time to do something about lowering your compressed air costs. Let us show you how easy it is with a Davey model to fit your particular operations.

INDUSTRIAL EQUIPMENT COMPANY

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Positive Precision Control

ASSURES SMOOTH, ACCURATE CUTTING

ON ALL grading jobs where accuracy is an important factor, Adams' *Positive Precision Controls* help to meet the most exacting specifications—*in minimum time—with minimum effort and expense.*

Some of the important features which contribute to the smooth, accurate cutting of Adams Motor Graders are: *Positive Fast-Acting Mechanical Controls*—for quick, accurate blade and scarifier adjustments . . . *Built-In Rigidity*—which holds blade and scarifier solidly in place . . . *Balanced Weight Distribution*—assuring always-ample pressures for forcing blade and scarifier into hard materials. And—Adams *8 Overlapping Forward Speeds* save time on all cuts by providing fastest practical speed on every type of grading operation.

Check Adams Motor Graders against any other graders on the market. You'll quickly discover why Adams Motor Graders are *Your Best Buy—All Ways!* See your local Adams dealer for complete details.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

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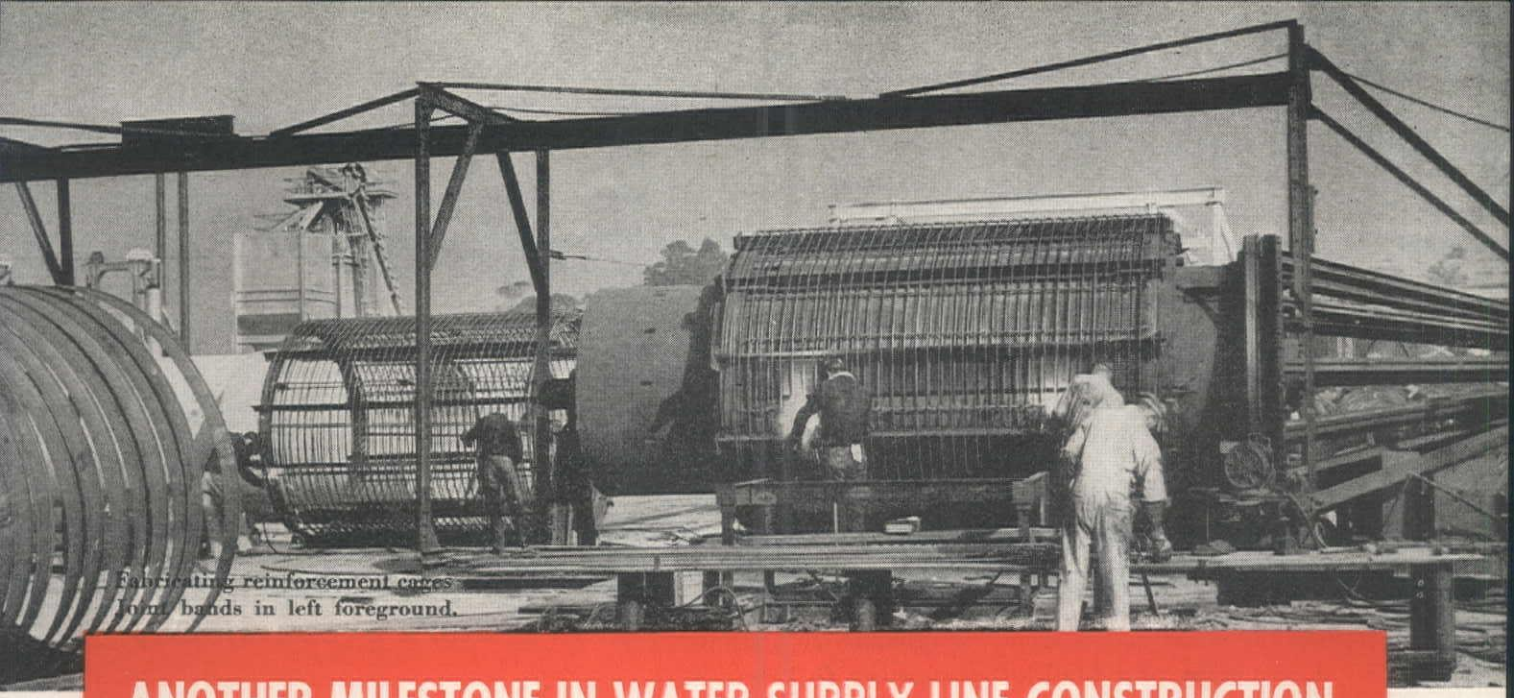
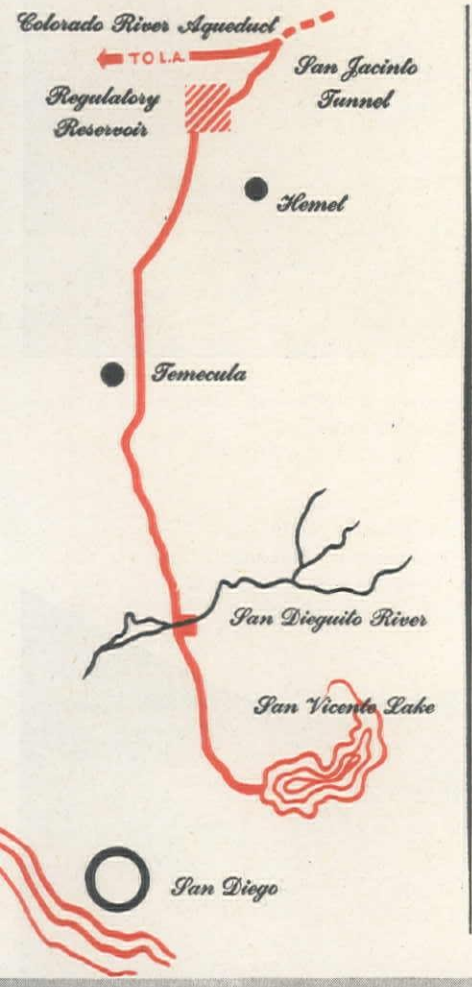
CALIFORNIA—*Western Factory Branch*, J. D. ADAMS MANUFACTURING CO., 230 7th Street, San Francisco 3; Adams Distributors at: San Francisco, Los Angeles, Sacramento, Redding, Riverside, San Jose, Fresno, Stockton, Salinas, Santa Rosa, Modesto, Visalia, Merced, Bakersfield, Santa Maria and San Diego • ALASKA—Glenn Carrington & Co., Fairbanks • ARIZONA—The O. S. Stapley Company, Phoenix • COLORADO—McKelvy Machinery Co., Denver • IDAHO—Intermountain Equipment Co., Boise, Pocatello • MONTANA—Industrial Equipment Co., Billings, Missoula; Hi-Line Equipment Co., Great Falls • NEVADA—Brown Motors, Reno • NEW MEXICO—Hardin & Coggins, Inc., 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 Equipment Co., Billings, Montana; The Lang Company, Salt Lake City, Utah.



Fabricating reinforcement cages. Form bands in left foreground.

ANOTHER MILESTONE IN WATER SUPPLY LINE CONSTRUCTION



Lock Joint Concrete Pressure Pipe will be used in over 90% of San Diego's great new 71.3 mile Aqueduct. It will combine high initial and sustained carrying capacity with long life, at low cost.

The last miles of pipe are now being poured for this vital supply line that will connect San Diego with the Colorado River Aqueduct. With diameters ranging from 48" to 96", this line provides another demonstration of advantages obtained by using Lock Joint Concrete Pressure Pipe for main water supply lines. Ample strength for higher operating heads (up to 550 feet in this aqueduct) water-tightness, permanence and low maintenance costs are proven by performance here and throughout the country. Economies in first cost, installation and operation have been shown under the full range of operating conditions.

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

American
PIPE & CONSTRUCTION COMPANY

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

P. O. Box 3428 • Terminal Annex • Los Angeles 54, California
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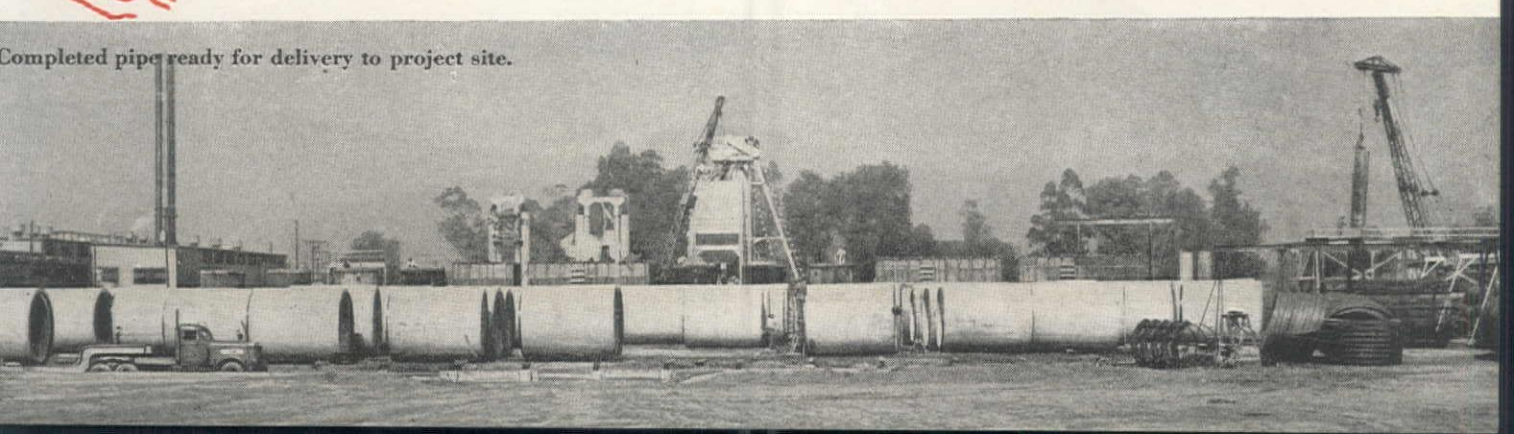
Quality pipe line products manufactured and installed by American include—
Lock Joint Concrete Cylinder Pipe • Prestressed Lock Joint Concrete Cylinder Pipe
American Concrete Cylinder Pipe • Centrifugal Concrete Pressure Pipe



Completed pipe ready for delivery to project site.

Here is the low-cost, motor-driven gas cutting machine you are looking for—the Airco No. 10 Radiagraph.

This machine cuts straight lines of any desired length in steel plate . . . arcs up to 42½ inch radius . . . and circles from 3 to 85 inches in diameter. Further it will prepare edges for welding with a straight butt edge, "V" groove, single or double "U" groove, single or double "J" groove, or double bevel groove without land . . . and it operates at speeds from 4 inches to 50 inches per minute.

Weighing only 41 pounds net, the No. 10 Radiagraph can be easily moved from job to job. To facilitate carrying, the machine has a hand grip on one end.

With this compact, nominally priced machine all shops engaged in preparing steel for welded fabrication can now enjoy the speed and economy of machine gas cutting.

For a copy of a booklet containing full details about the Airco No. 10 Radiagraph, write for ADC-614C. Address your nearest Airco office or Dept. WCN—5867, Air Reduction, General Offices, 60 E. 42nd St., New York 17, N. Y.; in Texas: Magnolia Airco Gas Products Co., General Offices, Houston 1, Texas. Represented Internationally by Airco Export Corporation.

AIRCO **AIR REDUCTION**

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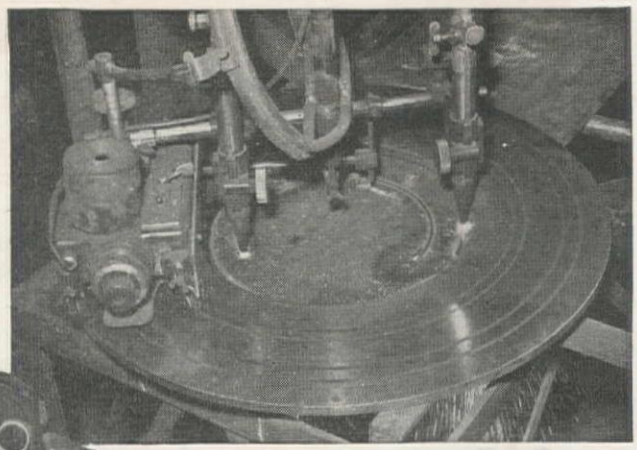
Headquarters for oxygen, acetylene and other gases . . . carbide . . . gas welding and cutting apparatus and supplies . . . arc welders, electrodes and accessories

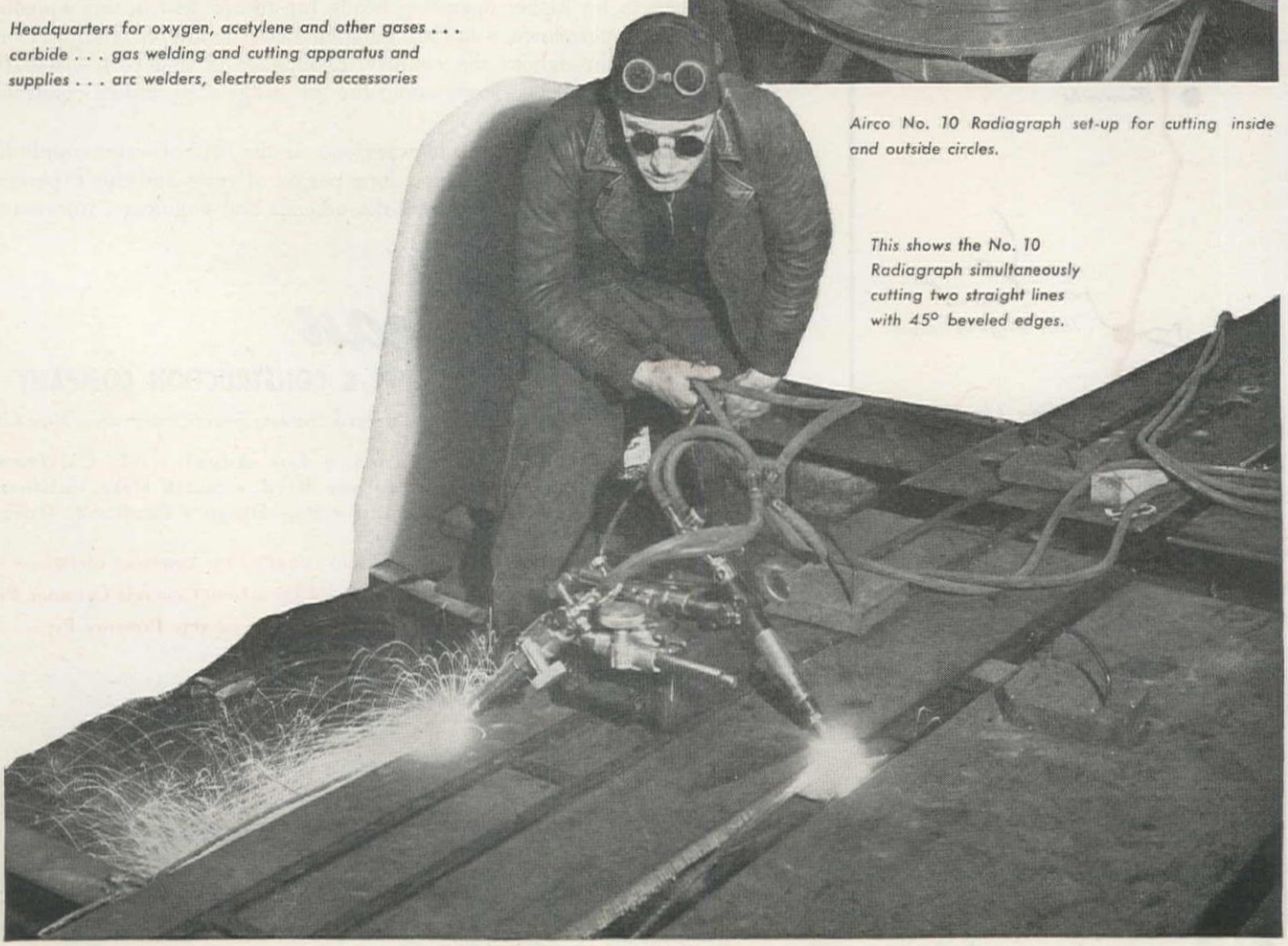
low cost PORTABLE GAS CUTTING MACHINE

cuts steel faster . . . more economically

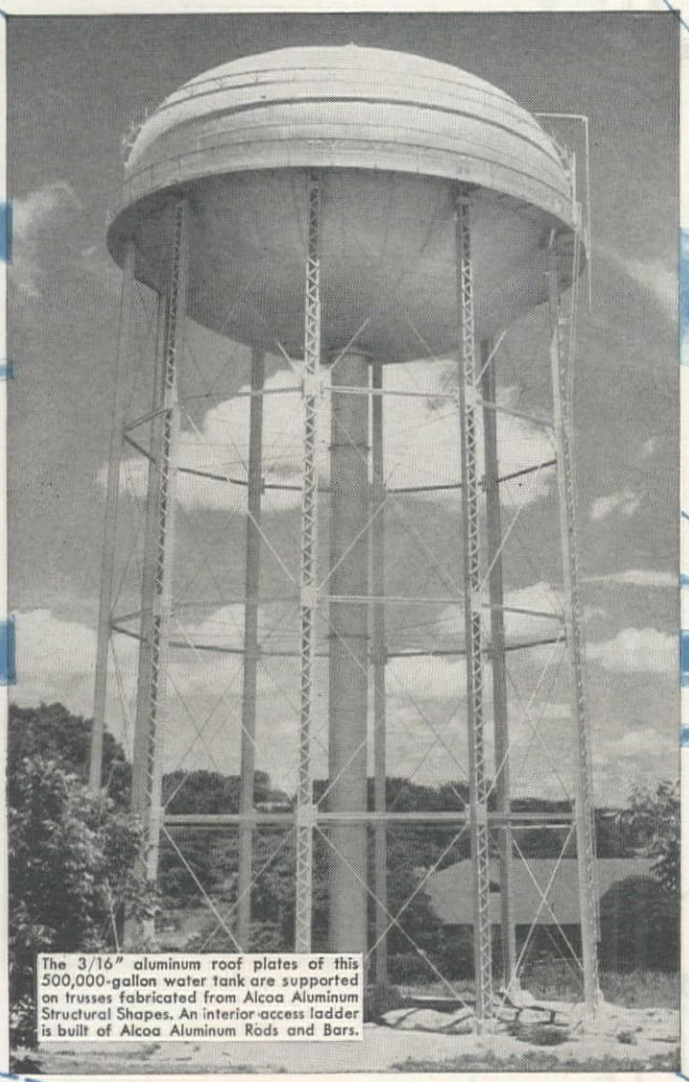


Airco No. 10 Radiagraph set-up for cutting inside and outside circles.

This shows the No. 10 Radiagraph simultaneously cutting two straight lines with 45° beveled edges.



An Aluminum Roof keeps this water tank from sweating its head off



The 3/16" aluminum roof plates of this 500,000-gallon water tank are supported on trusses fabricated from Alcoa Aluminum Structural Shapes. An interior access ladder is built of Alcoa Aluminum Rods and Bars.

When a water tank sweats . . . and they all do . . . it doesn't take long for those drops of water to perforate an ordinary metal tank roof. But a roof of Alcoa Aluminum effectively stops inside rusting. Eliminates the expense and hazards of interior and exterior painting.

The strong, light Alcoa Aluminum Alloys have many applications in structures where light weight and resistance to corrosion are desired. They are one-third the weight of steel, easy to fabricate, and easy to erect. Alcoa Aluminum structural shapes in all common sizes are available.

There are probably places where Alcoa Aluminum can be used to good advantage in the projects you are now designing and building. We'll be glad to help you decide. ALUMINUM COMPANY OF AMERICA, 1811 Gulf Building, Pittsburgh 19, Pa. Sales offices in leading cities.

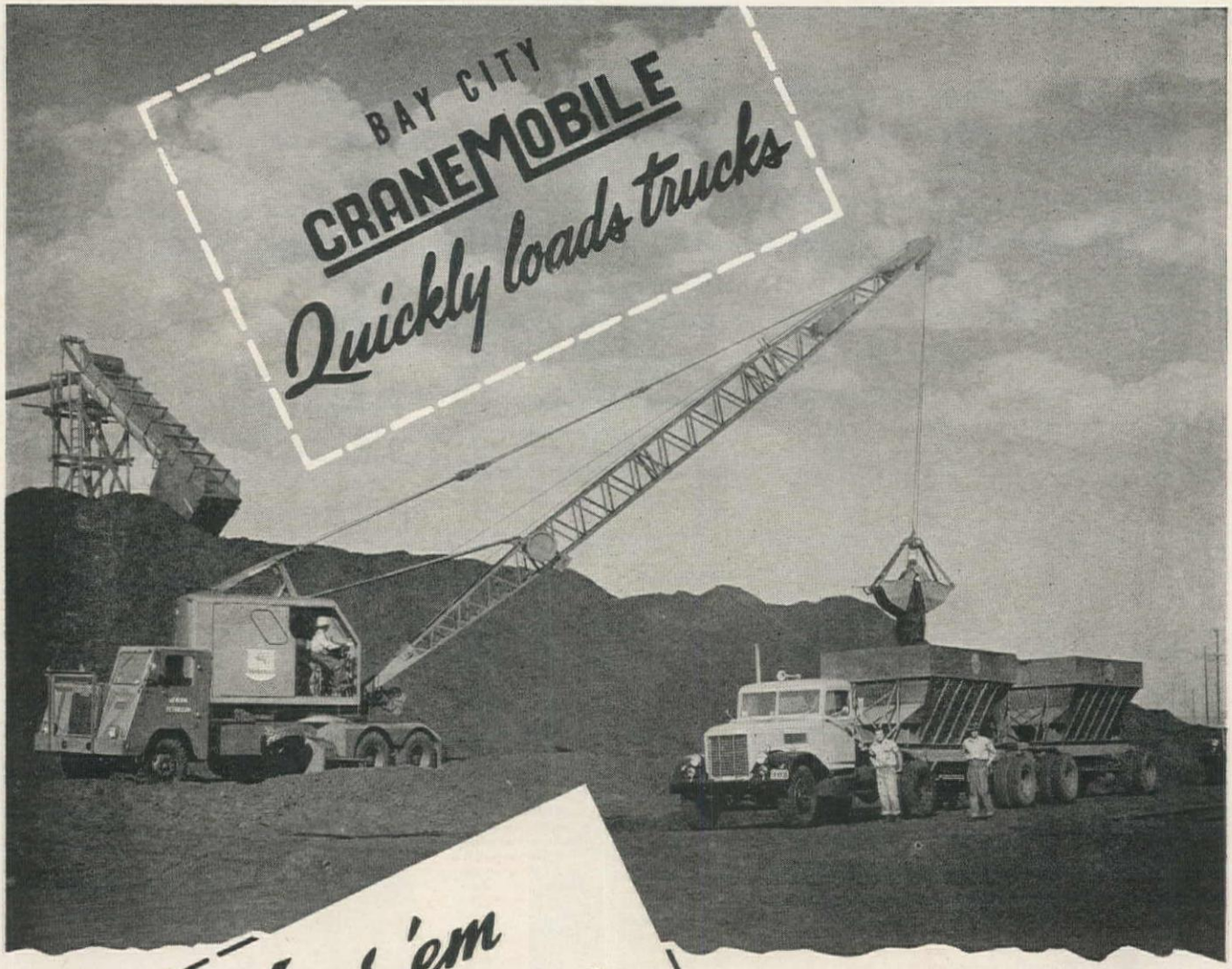
MORE people want MORE aluminum for MORE uses than ever

ALCOA FIRST IN **ALUMINUM**

REG. T. M.

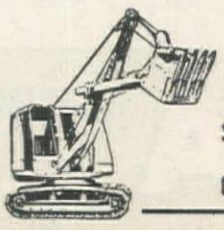
ALCOA ALUMINUM

IN EVERY COMMERCIAL FORM



Is loading trucks quickly and profitably one of your material handling problems? This BAY CITY CraneMobile loads 22 tons of coke from pile into trailer-trucks in from ten to fifteen minutes at the yards of the General Petroleum Co., Torrance, California. It's a Model 180T-60 CraneMobile, equipped with a 1-yard bucket at the end of the 50 ft. boom which permits fast, easy loading of railroad cars as well as trucks. There's a BAY CITY CraneMobile or Crawler Crane to speed and simplify your material handling and excavating jobs. See your nearest BAY CITY dealer or write direct. BAY CITY SHOVELS INC., Bay City, Michigan.

BAY CITY



SHOVELS • DRAGLINES
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SEE YOUR NEAREST DEALER: Brown-Bevis Equipment Co., Los Angeles-Phoenix; Feenaughty Machinery Co., Portland-Seattle-Boise-Spokane; B. M. Fletcher, Butte; Garfield & Co., San Francisco; Held & McCoy Machinery Co., Denver; C. H. Jones Equipment Co., Salt Lake City; Studer Tractor & Equipment Co., Casper, Wyoming.

HEAVY-DUTY JOB?

Put it up to an FWD

THE TRUCK FOR *all* HEAVY WORK *all year 'round*

The powerful drive on all four wheels of FWD four-wheel-drive trucks, plus FWD truck engineering based on over 36 years of experience concentrated on four-wheel-drive, give these rugged, dependable trucks outstanding advantages in all phases of heavy-duty road construction and maintenance work.

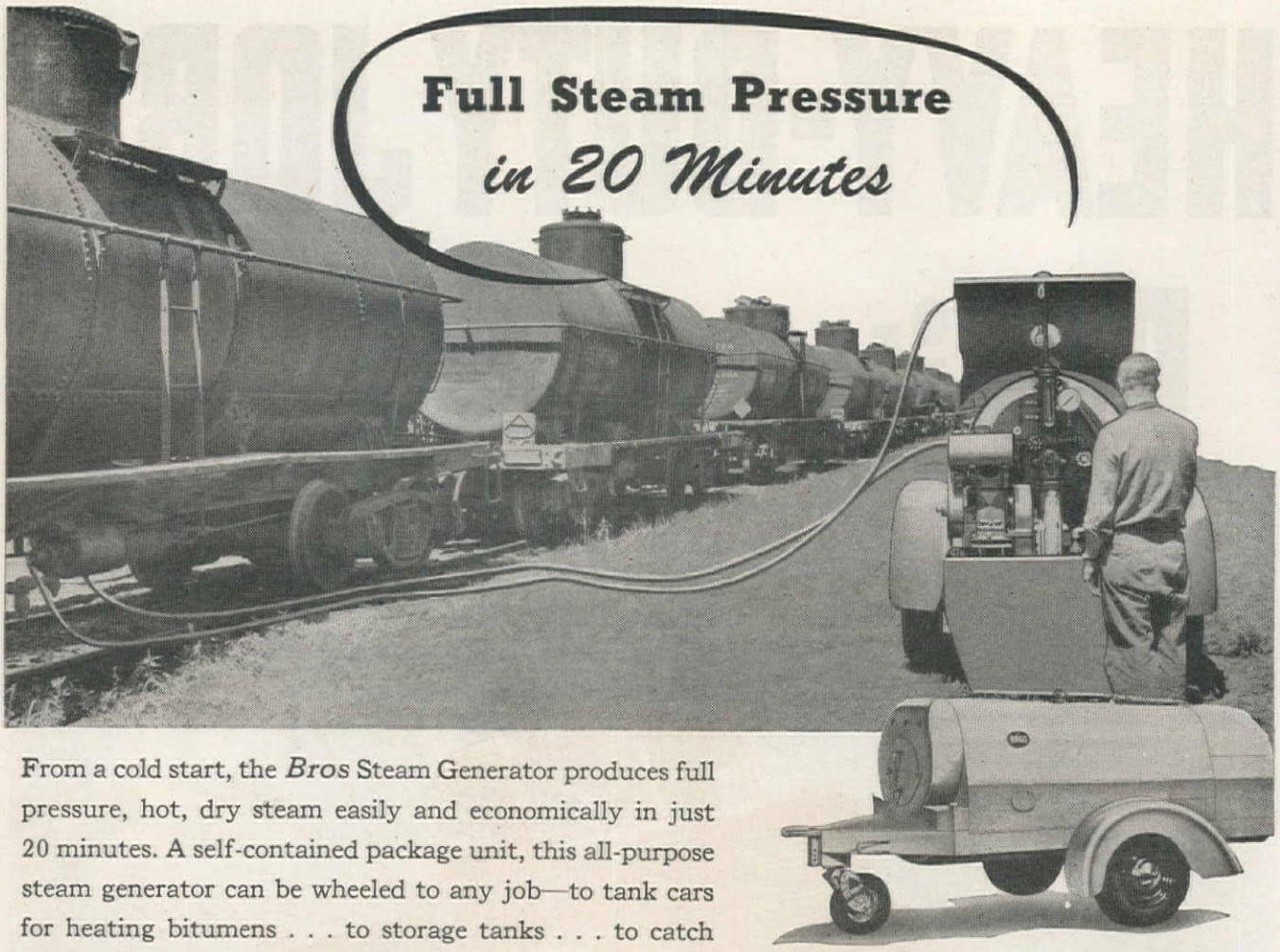
With underbody blade, the FWD has no equal for road patrolling—blading, grading, maintaining—fast, at low cost. All year 'round, heavy material hauling, heavy equipment transport, snow clearing, heavy emergency road work . . . all are done faster, safer, at lower cost, with FWDs — the ONE truck for MANY jobs. For complete information, see your nearest FWD Distributor or write to . . .

THE FOUR WHEEL DRIVE AUTO CO., CLINTONVILLE, WIS.
Canadian Factory: KITCHENER, ONTARIO

America's Foremost Heavy-Duty Truck

FWD Distributors: ARIZONA—Arizona-Cedar Rapids Co., 401 N. First St., Phoenix; CALIFORNIA—The Four Wheel Drive Auto Co., 1339 Santa Fe Ave., Los Angeles 21, 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; OREGON—Feenaughty Machinery Co., 112 S.E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th So., Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 6th Ave., So. Seattle 2, Glenn Carrington & Co., 91 Columbia St., Seattle, and Feenaughty Machinery Co., 715 N. Division St., Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne; ALASKA—Glenn Carrington & Co., Nome, Fairbanks, Anchorage.

Full Steam Pressure *in 20 Minutes*



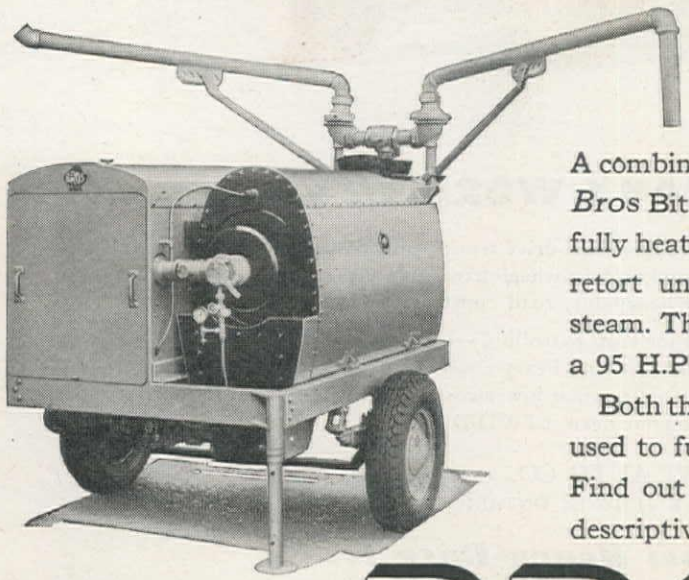
From a cold start, the *Bros* Steam Generator produces full pressure, hot, dry steam easily and economically in just 20 minutes. A self-contained package unit, this all-purpose steam generator can be wheeled to any job—to tank cars for heating bitumens . . . to storage tanks . . . to catch basins for thawing . . . to refrigerator cars . . . to steam pile drivers. As a stationary installation, it serves as operating equipment where steam is needed.

BROS Steam Generator

The attractive, streamlined *Bros* Generator is compact and highly portable. It gets jobs done faster and at lower costs. Available in 26, 41 and 55 developed H.P. units.

Faster Bituminous heating with the

BROS
CIRCULATOR



A combination heater and high speed pumping unit, the *Bros* Bituminous Circulator needs only 2 to 3 hours to fully heat and unload a 10,000 gallon tank car. Its direct retort unit heats to temperatures unobtainable with steam. The speedy, economical *Bros* Circulator includes a 95 H.P. power unit in its compact design.

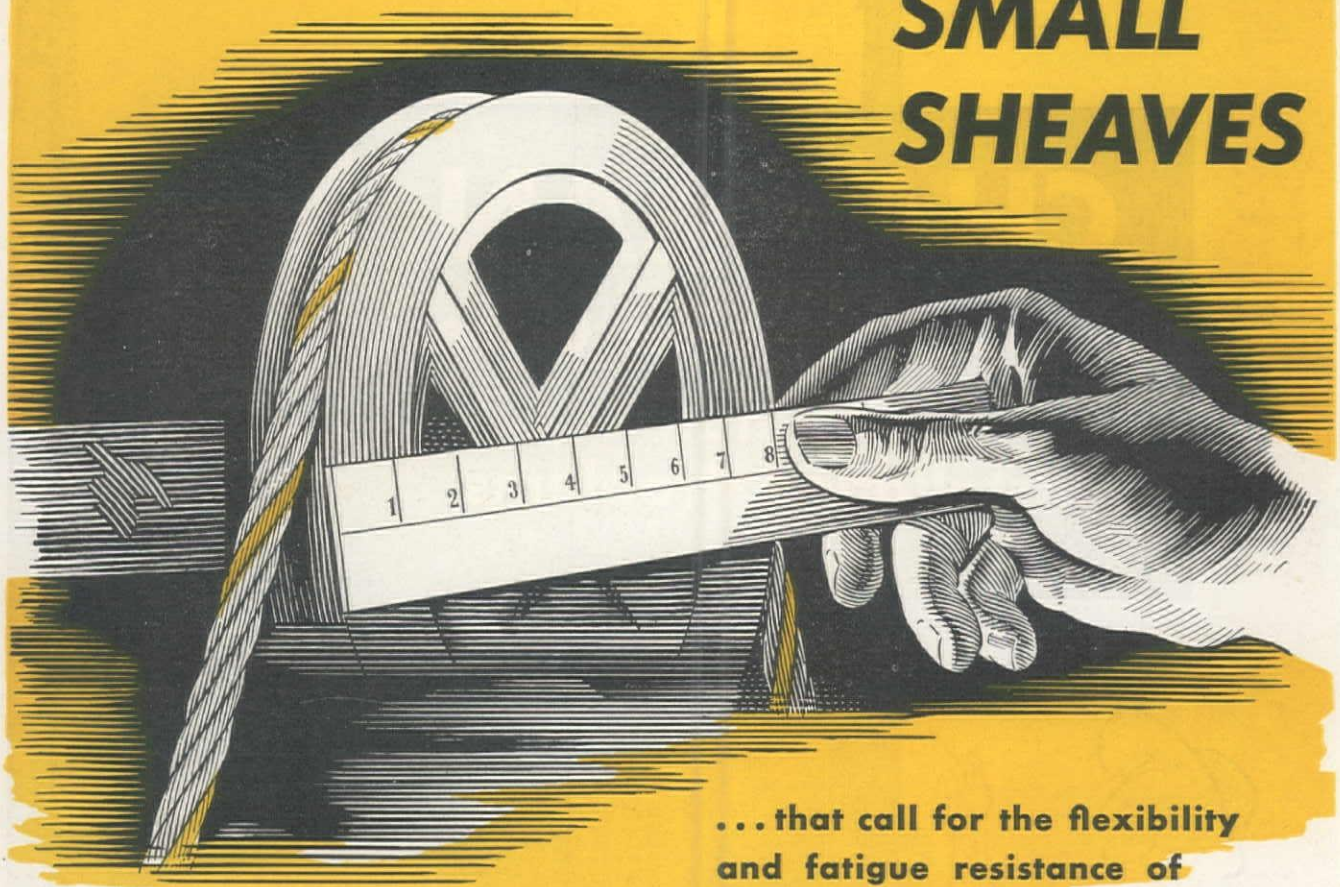
Both the *Bros* Generator and *Bros* Circulator may be used to further speed up heating of heavier materials. Find out *Bros* can answer your problem . . . write for descriptive information.

BROS

WM. BROS BOILER AND MANUFACTURING COMPANY • MINNEAPOLIS 14, MINNESOTA

We still have with us . . .

SMALL SHEAVES



. . . that call for the flexibility and fatigue resistance of *PREFORMED* YELLOW STRAND

In a lot of equipment lines, old and new models will have one feature alike: small sheaves—perhaps accompanied by small drums. Either is tough on wire rope. Both should remind you to *minimize* their fatiguing effect by using *Preformed* Yellow Strand.

While reasonable bending is expected of unpreformed rope, severe bending tends to break down the steel itself. High speeds, heavy loads and reverse bends all hasten a premature end.

The *flexibility* of *Preformed* Yellow Strand enables it to hold its own *longer* against fatigue. Its wires and strands can concentrate on the *external* bending job, because *internal* stresses have been virtually neutralized during manufacture. Instead of having been forcibly twisted into place, the parts have been preshaped to the spiral curvature they keep in the finished rope.

Along with greater endurance, smooth-running *Preformed* Yellow Strand offers faster installation . . . higher kink-resistance . . . increased protection for workmen.

Specify *Preformed* Yellow Strand by name. Get all you should in wire rope performance and economy. Broderick & Bascom Rope Co., St. Louis 15, Mo. *Branches:* SEATTLE, Portland, New York, Chicago, Houston. *Factories:* SEATTLE, St. Louis, Peoria.

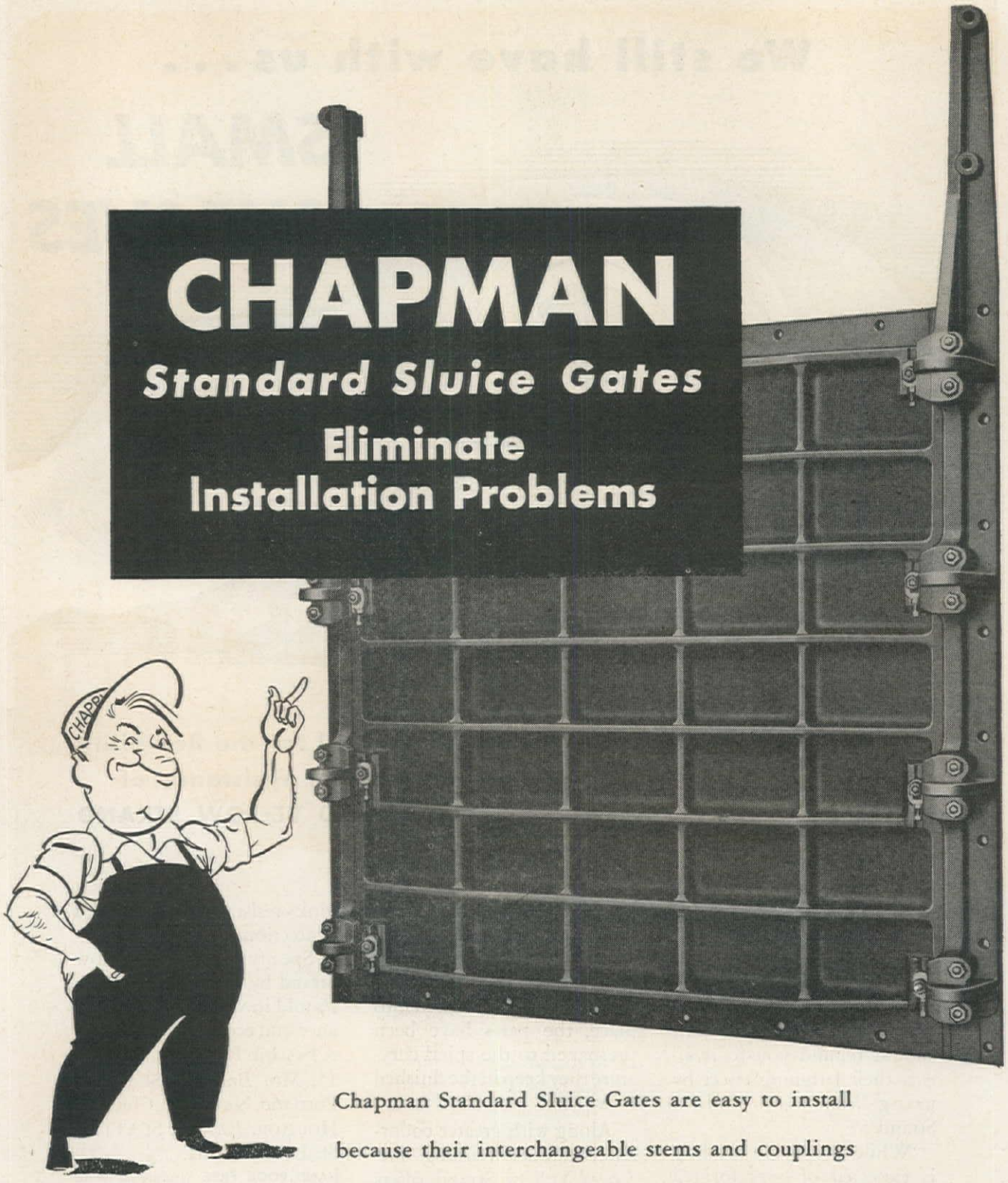
HAND BOOK FREE: "Industrial Wire Ropes" contains useful facts, tables, pictures. Write for your copy.

BRODERICK & BASCOM
Yellow Strand
***PREFORMED* WIRE ROPE**

CHAPMAN

Standard Sluice Gates

Eliminate Installation Problems



Chapman Standard Sluice Gates are easy to install because their interchangeable stems and couplings require no match-marking. They may be obtained with any type of operating control—manual, hydraulic cylinder or motor unit (completely enclosed in weatherproof housing, and delivered wired—ready for installation Send for a copy of Chapman's Sluice Gate Handbook for complete information.

THE CHAPMAN VALVE MFG. CO.

INDIAN ORCHARD, MASSACHUSETTS

THE HOUGH "HUFF" Payloader

PAYS OFF IN..... Speed! Capacity! Mobility!

The Model HL 1 yd. Payloader was designed from the tires up for fast, efficient excavation and loading. Built big and powerful, yet fast and maneuverable, to the job and on the job, the Model HL will turn out big yardage at a minimum of operating and maintenance expense.

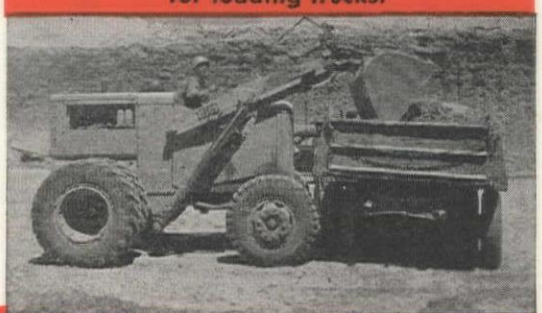
Handles earth excavation, sand, gravel, aggregate, snow, or any other bulk material; pulls blade graders; loads spoil; used for street and highway construction or maintenance — on any job, a Payloader will cut costs sharply. Crane and Bulldozer attachments extend its use and versatility.

Hough Payloaders are the result of over 25 years of material handling engineering experience and are backed by a world wide distributor organization. Send today for new catalogs on the 1 yd. gasoline or Diesel Model HL; or the 10½ cu. ft. Model HA.

OVER 6500 NOW SERVING INDUSTRY THE WORLD OVER

Readily convertible for bulldozer service.

Long, high dumping reach for loading trucks.



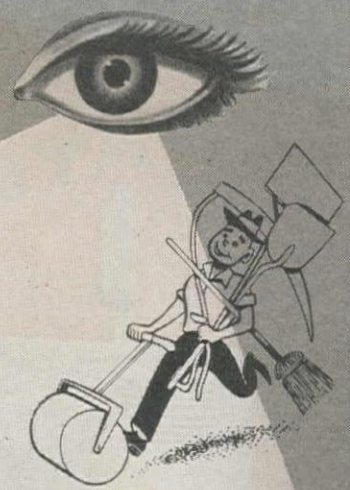
THE FRANK G. HOUGH CO.

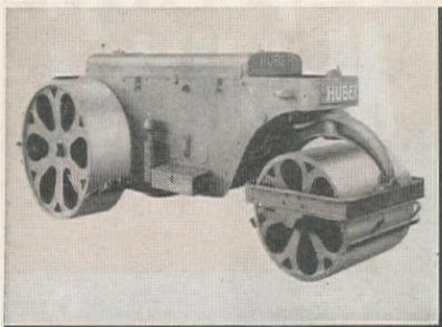
MATERIAL HANDLING EQUIPMENT SINCE 1920

707 SUNNYSIDE AVENUE, LIBERTYVILLE, ILLINOIS

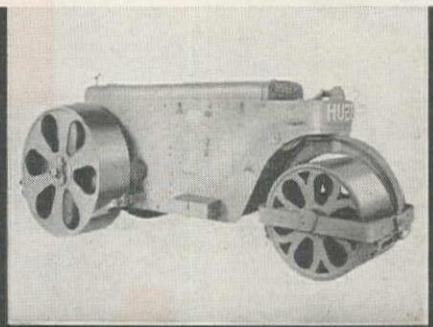
THERE'S MORE TO HUBER ROAD MACHINERY THAN MEETS the EYE

There is Huber's many years of know-how in building dependable, speedy, and long lasting 3-wheel and Tandem Rollers, which has played such a vital part in the outstanding success of the Huber one-man-operated Maintainer. There is Huber's expert knowledge of road machinery application and the needs of the vast road building fraternity. Then there is Huber's network of strategically located Distributors who know the local picture and who augment Huber's sincere desire to serve. All of these are behind every piece of Huber Road Machinery you buy. And that is why you can buy Huber Rollers and Maintainers with confidence.

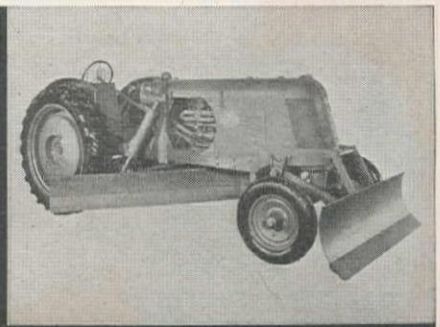




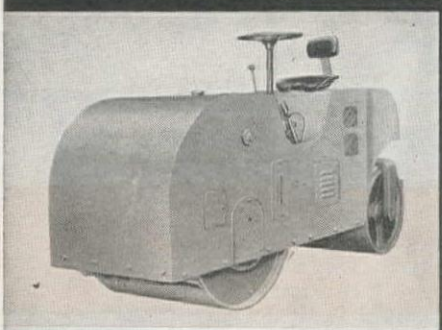
● HUBER 5 and 6 TON — 3 Wheel Roller



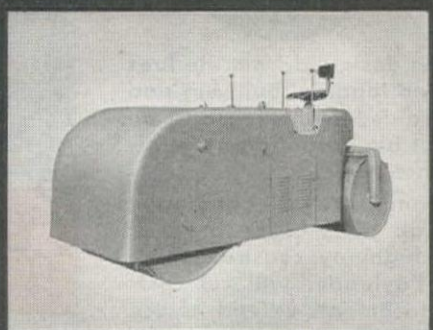
● HUBER 8 TON — 3 Wheel Roller
Also built in 10 - 12 Ton Size



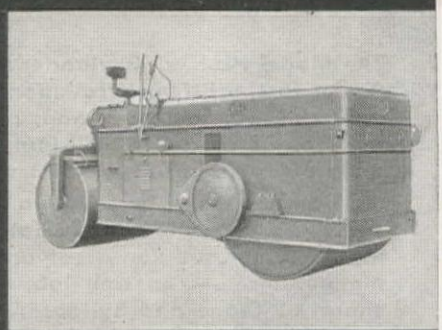
● HUBER — Maintainer



● HUBER 3-4 TON Variable Weight Tandem Roller



● HUBER 5-8 TON Variable Weight Tandem Roller



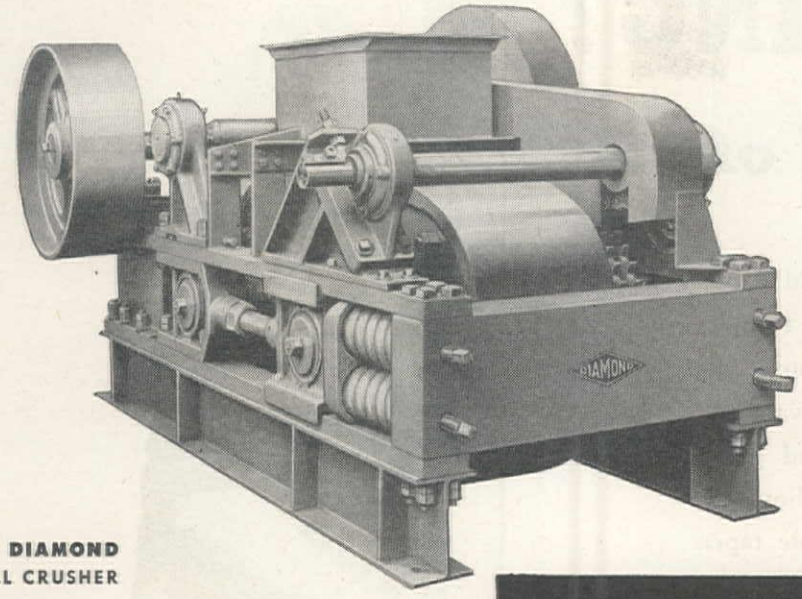
● HUBER 8-12 TON Variable Weight Tandem Roller

THE HUBER MFG. COMPANY ● MARION, OHIO, U. S. A.

LEE & THATRO EQUIPMENT CO. ..... Los Angeles 21, California
JENKINS & McCLOUD ..... Reno, Nevada
CONTRACTORS' EQUIPMENT & SUPPLY CO. ..... Albuquerque, New Mexico
NEIL B. McGINNIS CO. ..... Phoenix, Arizona
FEENAUGHTY MACHINERY CO. ..... Portland 14, Oregon
FEENAUGHTY MACHINERY CO. ..... Boise, Idaho
FEENAUGHTY MACHINERY CO. ..... Seattle 4, Washington
FEENAUGHTY MACHINERY CO. ..... Spokane 2, Washington
WESTMONT TRACTOR & EQUIPMENT CO. ..... Missoula, Montana
EDWARD F. HALE CO. ..... Hayward, California
EDWARD F. HALE CO. ..... San Francisco 7, California
FOULGER EQUIPMENT CO., INC. ..... Salt Lake City 8, Utah
THE COLORADO BUILDERS' SUPPLY CO. ..... Denver 9, Colorado
Scotts Bluff, Nebraska, Casper, Wyoming

A BRUTE WITH ABILITY...

TO TAKE LONG TIME PUNISHMENT



THE **DIAMOND**
ROLL CRUSHER

THERE'S NOTHING TOUGHER THAN A DIAMOND

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

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

DIAMOND

DIAMOND

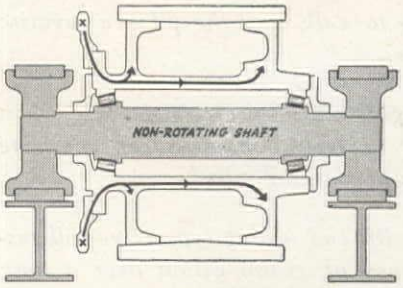
DIAMOND

DIAMOND

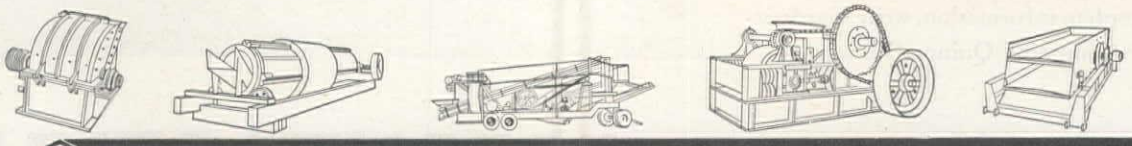
DIAMOND

DIAMOND

SEVERAL REASONS WHY...



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



DIAMOND

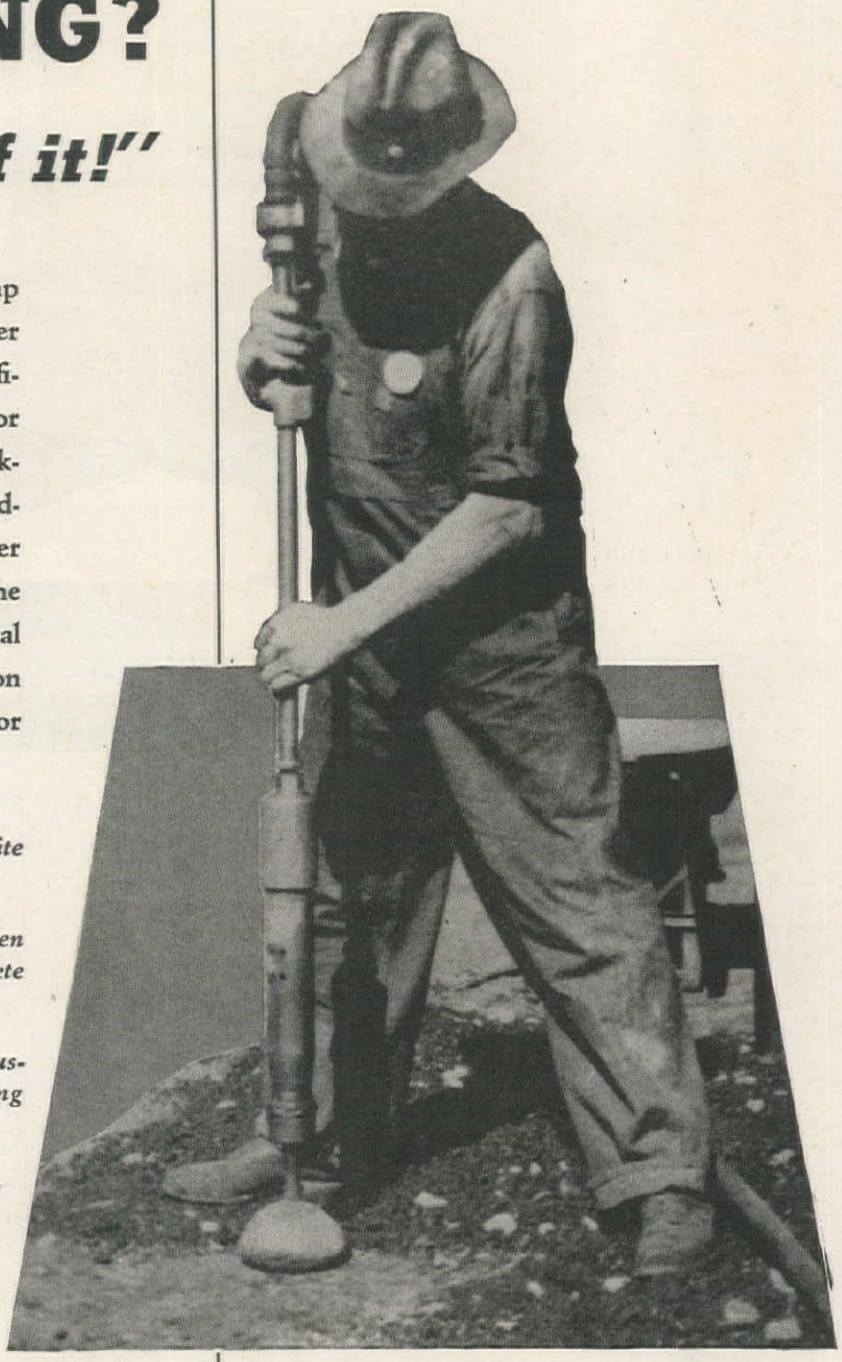
DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING COMPANY DIVISION
MINNEAPOLIS 11, MINNESOTA

YOUR NEAREST DIAMOND DEALER FOR SALES AND SERVICE

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

"FREEZING?

never heard of it!"



The weather may be cold and damp —but a Gardner-Denver Backfill Tamper goes right on working at top-notch efficiency! There's no tendency of valve or exhaust to freeze. Its piston rod packing retains its seal for months without adjustment or renewal. The double taper fit of the butt and its lock-nut keeps the butt always tight. Here are additional reasons why you'll want to standardize on Gardner-Denver Backfill Tampers for your job.

✳ *Easy to walk over the fill — a favorite of operators.*

✳ *Integral oil reservoir feeds only when tamper is in operation — assures complete lubrication of working parts.*

✳ *Low lift end-seating type valve will sustain efficiency of piston action over a long period of time.*

✳ *Piston rod packing and butt attachment conveniently arranged for quick and easy access.*

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

GARDNER-DENVER

USE COMPRESSED AIR FOR SAFETY CONVENIENCE FLEXIBILITY

SINCE 1859

Western Branch Offices:
Butte, Mont.; Denver, Colo.;
Los Angeles, Calif.; Portland, Ore.;
Salt Lake City, Utah; San Francisco, Calif.;
Seattle, Wash.; Wallace, Idaho;
El Paso, Texas.

Get to the job and through with the job quicker with the

self-propelled WOOD ROADMIXER model 36

Above: Windrow entering mixing drum. Below: Thoroughly mixed windrow ready for spreading. Mixer takes binder directly from tank truck.

A complete traveling mixing plant

For all kinds of mix-in-place work you get to the job faster with the self-propelled Wood Roadmixer Model 36 because it has a road speed of 15 miles per hour. Being rubber-tired, it cannot harm existing pavement.

You get through with the job quicker with the Model 36 because it mixes in ONE PASS all types of aggregates or soils with any type of liquid binder — handles up to 4 cu. ft. windrows — has mixing speeds from 11.5 to 40 ft. per minute and produces as much as 150 tons of ready-to-spread mix per hour.

These are profit factors on every soil stabilization or surfacing job. The Wood Roadmixer Model 36 offers additional savings because it is one-man operated.

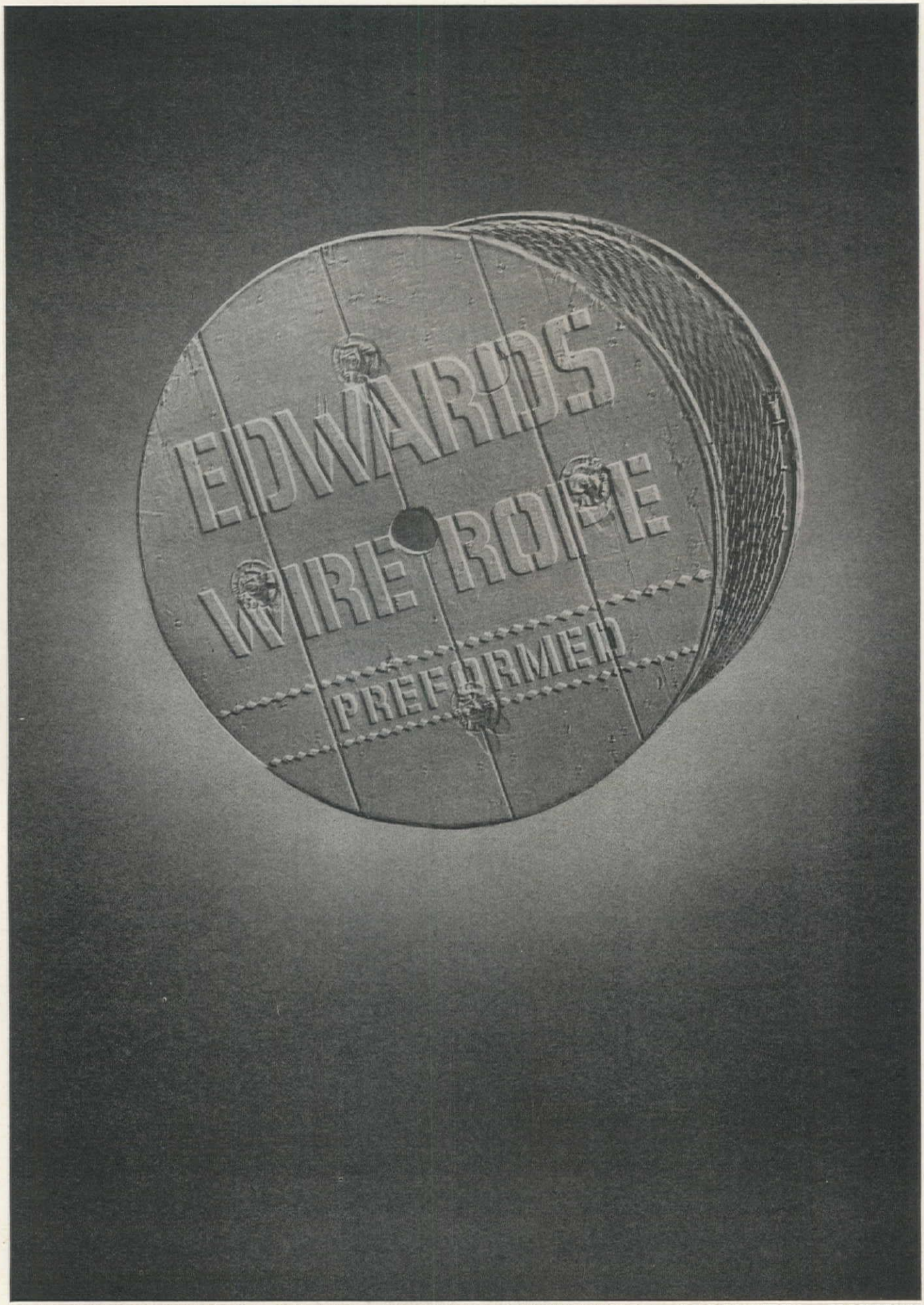
Learn more about the self-propelled Wood Roadmixer Model 36 — the most talked about piece of road-building equipment on the market today. Per ton of capacity it costs less than any comparable equipment. See your Wood Roadmixer distributor or write direct for literature and prices on Wood Roadmixers, Tank Trailers, Windrowers, and V-Spreaders.

ROADBUILDING EQUIPMENT

WOOD MANUFACTURING CO.

BOX 620, 6900 TUJUNGA AVENUE • NORTH HOLLYWOOD, CALIFORNIA

Distributors: P. L. CROOKS & CO., Portland 10, Ore. ★ ARNOLD MACHINERY CO., INC., Salt Lake City 1, Utah ★ INDUSTRIAL EQUIPMENT CO., Billings, Mont. ★ WORTHAM MACHINERY CO., Cheyenne, Wy. ★ THE MINE & SMELTER SUPPLY CO., Denver, Colo. ★ HARDIN & COGGINS, Albuquerque, N. M. ★ STATE TRACTOR & EQUIPMENT CO., Phoenix, Ariz. ★ SIERRA MACHINERY CO., Reno, Nev. ★ COAST EQUIPMENT CO., San Francisco 1, Calif. ★ GOLDEN STATE EQUIPMENT CO., Los Angeles, Calif. ★ WILLARD EQUIPMENT CO., Vancouver, B. C.



E. H. EDWARDS COMPANY — SEATTLE — PORTLAND — SAN FRANCISCO — LOS ANGELES — HOUSTON

Will your next truck be "Job-Rated"?

ARE YOU trying to get along with trucks that are uneconomical to operate?

Are your costs high as a result of trucks that don't fit your particular hauling needs?

If so, you're probably considering replacing your equipment with trucks that really fit your job, save you money!

It stands to reason that a truck that fits your loads and operating conditions—will give better performance, better service to your customers, and operate at lower cost.

To give you exactly the right truck for your loads . . . over your roads . . . Dodge builds 175 different "*Job-Rated*" chassis models.

In each, you get exactly the right one of 7 engines—to give the pulling power you need with the economy you want.

You get exactly the right one of 5 clutches, 4 transmissions, 18 rear axles . . . the right springs, brakes, and other chassis units . . . for "top" performance, longer life.

To make sure that your next truck is "*Job-Rated*" to fit your job, see your Dodge dealer . . . because *only* Dodge builds "*Job-Rated*" trucks!

DODGE DIVISION OF CHRYSLER CORPORATION

ONLY DODGE BUILDS "Job-Rated" TRUCKS

Fit the Job . . . Last Longer !

BAKER STURDY

Because it's SIMPLE

If it's low cost yardage you're after, the simplicity of Baker Bulldozers will pay off in many ways. In faster action; more accurate, more positive control; in less maintenance expense; in greater rigidity; in longer useful life.

Baker's are simple in design and construction — there's less linkage, fewer points of wear, direct down pressure, no wobble or shimmy — that is why Bakers deliver the yardage, hour after hour, shift after shift — and that's also why there are more Baker 'dozers on Allis-Chalmers tractors than all others combined.

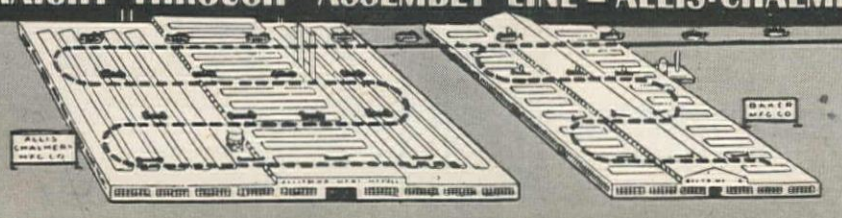
When you equip your A-C with a Baker, you've got the best combination on earth — a fine tractor, a great bulldozer, an unbeatable team. Get on the right track now — see your nearby A-C Baker distributor today.

BAKER MFG. CO • Springfield, Ill.

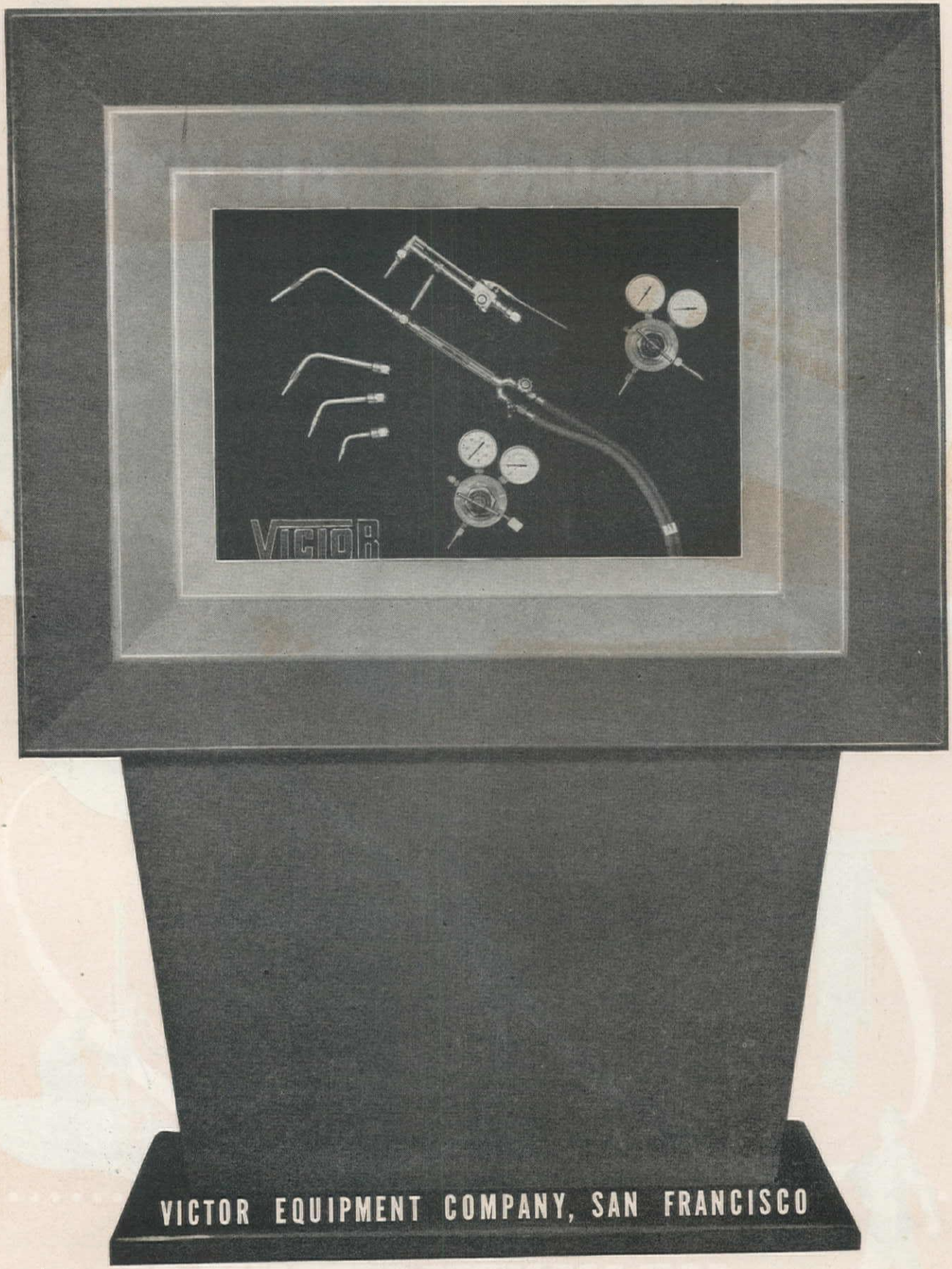
BAKER

BAKER They Go Together! A-C

"STRAIGHT THROUGH" ASSEMBLY LINE – ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crawler tractor plant. When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.


VICTOR
VICTOR EQUIPMENT COMPANY, SAN FRANCISCO

Build fast...
Build to last...
Build with Steel

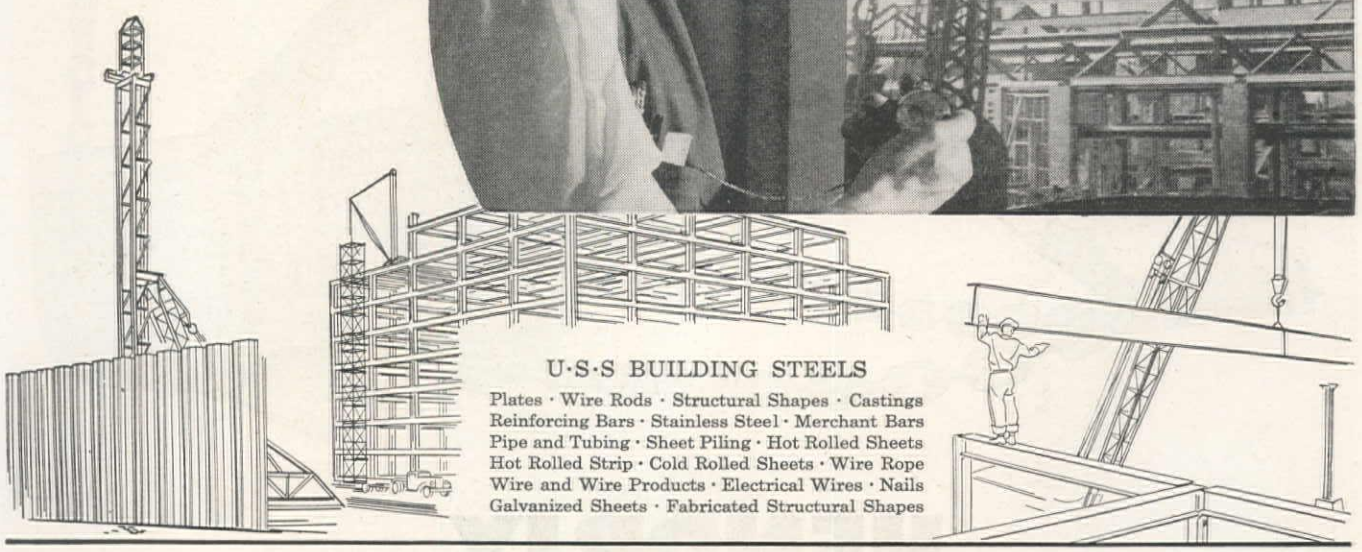
The more steel in a job, the easier it is to figure ...the faster it goes up...the longer life it has. For steel, being prefabricated, is *all* usable... and is, in most instances, ready for immediate erection when it arrives on the site.

Steel thus eliminates many costly operations, simplifies and speeds the construction of urgently needed permanent projects. Its fire resistance, high strength, long life and low upkeep make steel the ideal material for construction work of all kinds.

For details concerning U·S·S Building Steels, write, wire or call our nearest office.

Only Steel can give you all of these seven structural advantages

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



U·S·S BUILDING STEELS

Plates · Wire Rods · Structural Shapes · Castings
Reinforcing Bars · Stainless Steel · Merchant Bars
Pipe and Tubing · Sheet Piling · Hot Rolled Sheets
Hot Rolled Strip · Cold Rolled Sheets · Wire Rope
Wire and Wire Products · Electrical Wires · Nails
Galvanized Sheets · Fabricated Structural Shapes

COLUMBIA STEEL COMPANY

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

Pacific Coast Distributors for

AMERICAN BRIDGE COMPANY · AMERICAN STEEL AND WIRE COMPANY · NATIONAL TUBE COMPANY
CARNEGIE-ILLINOIS STEEL CORPORATION · TENNESSEE COAL, IRON & RAILROAD COMPANY

United States Steel Export Company, New York

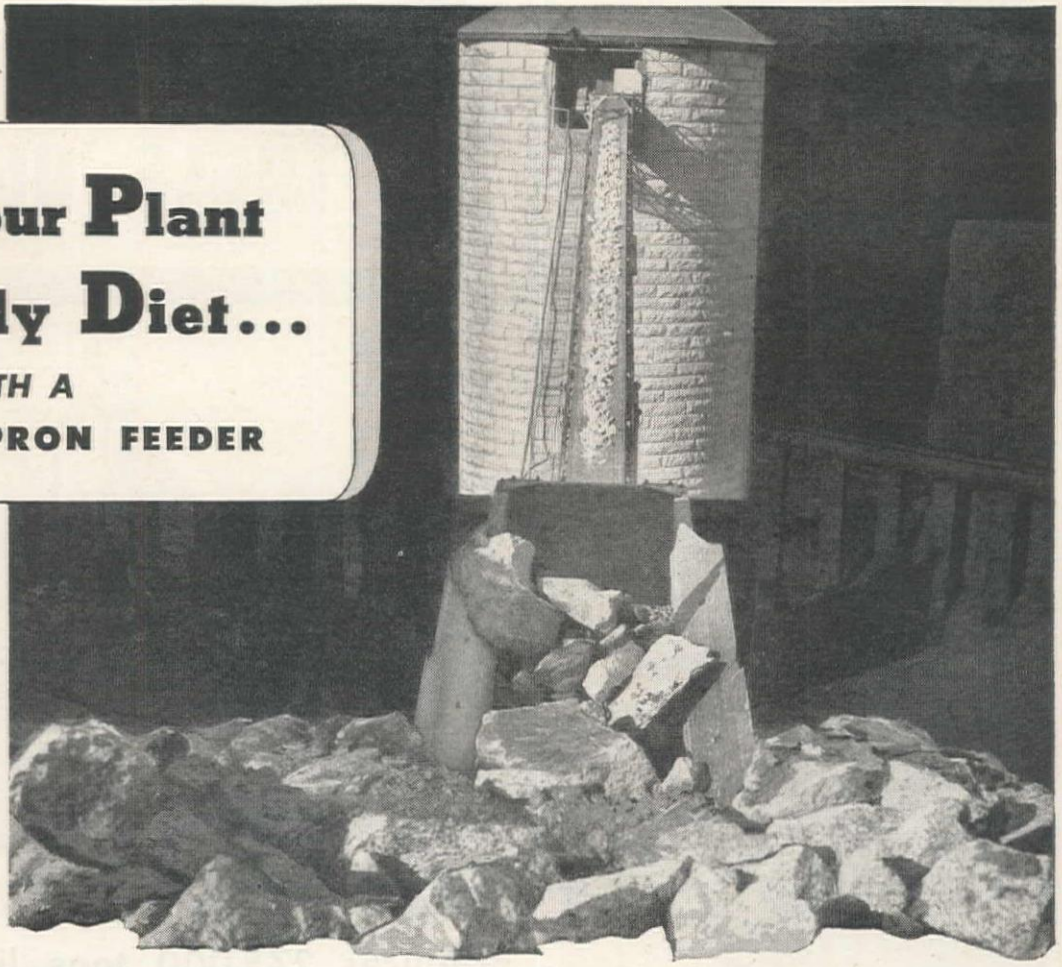
USS STEEL UNITED STATES STEEL

UNITED STATES STEEL

Give your Plant a Steady Diet...

WITH A

PIONEER APRON FEEDER



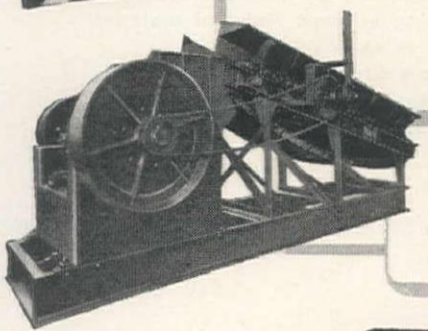
Maximum production in quarry, pit or mine calls for a *steady flow* of material to crushers, screens and conveyors. Because the feeder controls the flow of material throughout the entire plant, it is recognized as the *most important single factor* in determining cost of material per ton.

When the North Carolina Granite Corporation at Mount Airy, North Carolina laid plans for converting waste granite into road stone and concrete aggregate, a 14′x42″ Pioneer Apron Feeder was included in their plant. Now 26 foot side dump railroad cars hurl huge chunks of granite into the specially constructed hopper. And . . . the tough Pioneer Apron Feeder starts it flowing at 100 tons an hour.

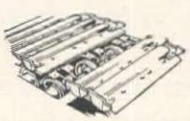
Pioneer makes a complete line of feeders . . . all sizes—all types to solve any feeding needs. Send your problems to Pioneer—for higher output—lower upkeep.

PIONEER ENGINEERING WORKS

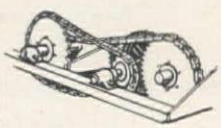
1515 Central Avenue • Minneapolis 13, Minnesota



● Pans are ½″ thick forged steel plate formed to overlap for great strength and rigidity.



● Cut-steel sprockets in the compact, efficient arrangement of the reduction gear reduce maintenance costs, save chain wear.



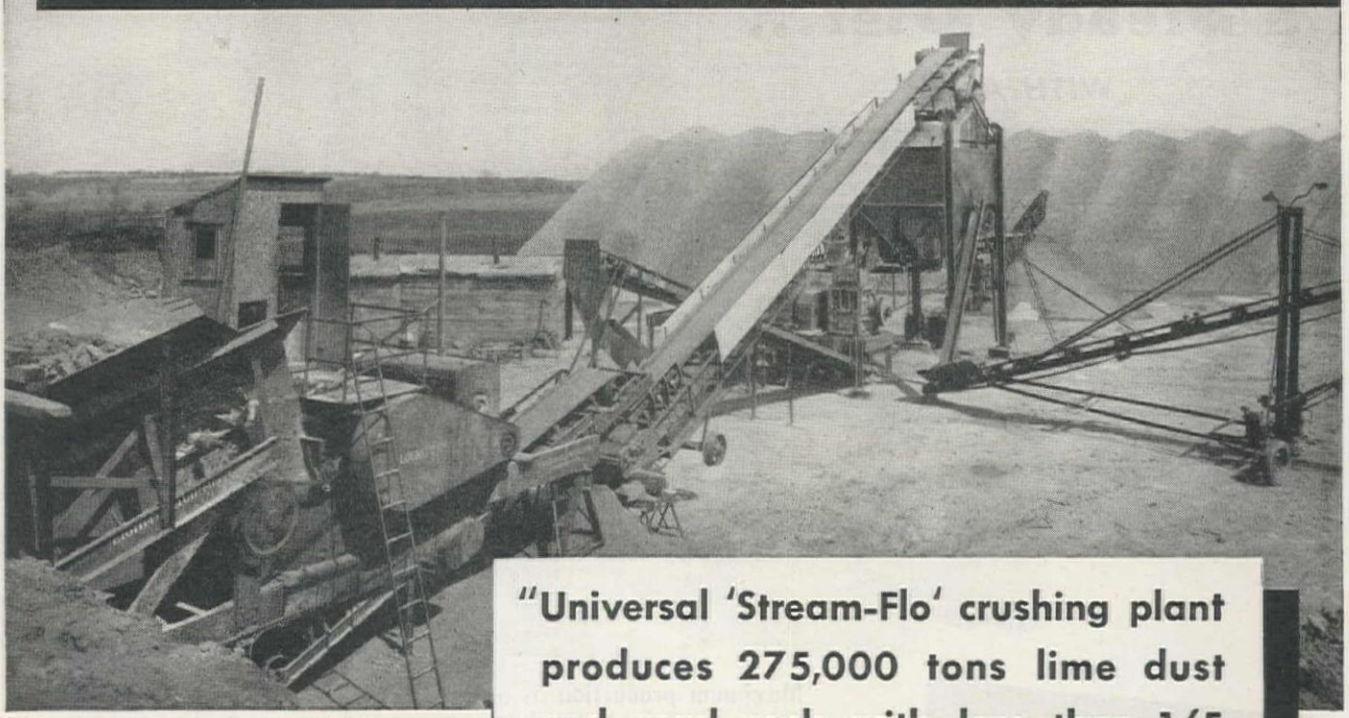
BUY BOTH—

Higher Output, Lower Upkeep!

Pioneer *Continuflo* EQUIPMENT

Neil B. McGinnis Company, Phoenix, Arizona; Pioneer Machinery Company, Idaho Falls, Idaho; Sanford Tractor & Equipment Company, Reno; Tractor & Equipment Company, Sidney, Montana; Westmont Tractor & Equipment Company, Missoula, Montana; Coast Equipment Company, San Francisco; Connelly Machinery Company, Billings and Great Falls, Montana; Elton T. Fair Company, Denver; Feenaughty Machinery Company, Portland, Seattle, Spokane, Boise; Harron, Rickard & McCone Company of Southern California, Los Angeles; The Lang Company, Salt Lake City.

Mountains of PROFITABLE "AGLIME"



"Universal 'Stream-Flo' crushing plant produces 275,000 tons lime dust and road rock with less than 1/5 cent per ton necessary for repairs."

So says, Lourde T. Renner of Sterling, Illinois who finds lime dust production mighty profitable with his Universal "Stream-Flo" crushing, screening and loading plant. During the past 24 months this plant produced 275,000 tons of lime dust and road rock with less than $500 necessary for repairs. Average daily production is 200 tons per hour. 21,000 tons of lime dust and 1000 tons of road rock have been produced in a single month.

The Renner plant uses a Universal 546-P portable primary crushing unit with a 36"x8' apron feeder and a 20x36 roller bearing jaw crusher. Material flows by conveyor to a 2-deck gyrating screen mounted over a 3-compartment steel bin. Oversize is mechanically fed to a No. 5 Universal pulverizer and returns to screen via conveyors. Plant set-up is primarily for lime dust production but a simple adjustment gives both lime dust and road rock without changing screens. Finished material is loaded from bin or stock pile.

There's profit in lime dust production. Let Universal show you how to produce "aglime" at a cost that leaves more profit. Write for illustrated literature and the facts.

CONTRACTORS EQUIPMENT CORPORATION
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ROCK, GRAVEL AND LIME CRUSHING PLANTS • CONVEYORS • APRON FEEDERS SCREENING AND WASHING PLANTS

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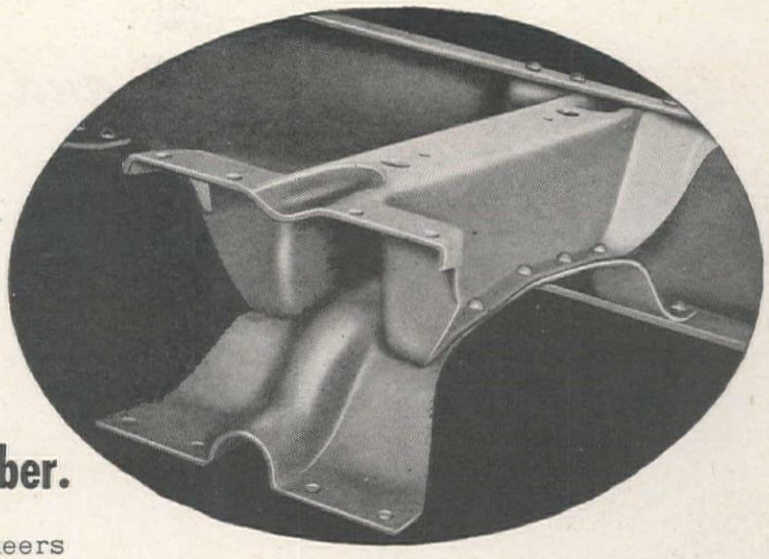
ENGINEERING CORPORATION
323 Eighth Street N.W., Cedar Rapids, Iowa



This is a box-girder cross-member.

It is a Mack box-girder. Mack engineers designed it; you find it only on Mack trucks. It has proved the best all-around cross-member ever designed.

It has tremendous beam strength in both vertical and horizontal planes. It possesses extremely high torsional rigidity. Its specially designed jaw ends assure greatest possible stiffness at every junction.

Consequently, it ties side-members together positively; always keeps them uniformly spaced. It imparts exceptional torsional stiffness to a frame. It won't spraddle. It produces a frame that won't weave, a frame that stays true, a Mack frame!

This cross-member is an example of what we mean when we say a Mack is a precision-built truck and not a mass-production truck. Every part of a Mack is specifically designed and engineered to do its job.

We put this extra work into Macks—so you can get extra work out of them.

Mack

since 1900, America's hardest-working truck

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.

Trucks for every purpose

WORKING IN MIRE like this calls for all the stamina and driving power you can get in a truck. This mighty Mack LR Model is equipped with the exclusive Mack axle-type Power Divider which preserves traction where the going is slippery. It is in the service of **Signal Mountain Portland Cement Company**

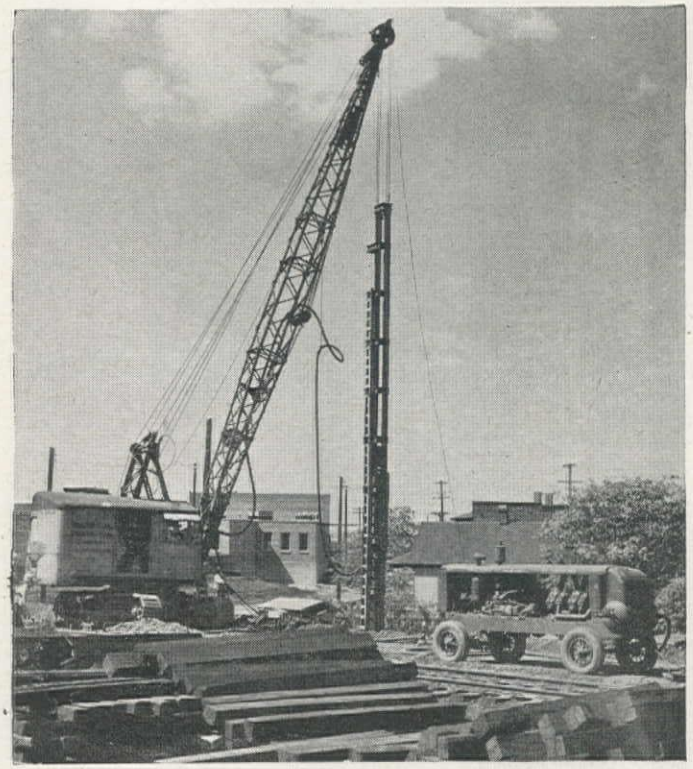
SPEED WORK *and* CUT COSTS

with **CP** *contracting equipment*

In the wide range of CP products the contractor will find just the right compressor, pneumatic tool, sinker drill, wagon drill, backfill tamper, and other equipment, to cut costs and assure profits. For full information get in touch with your nearest CP office, or write for a copy of Catalog 600, "CP Construction Equipment".

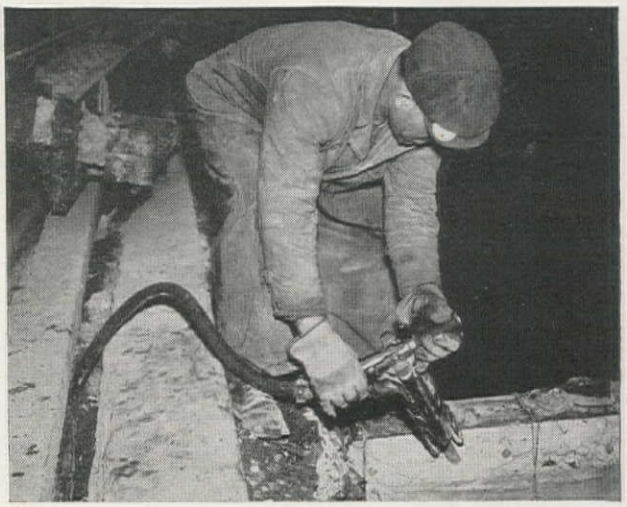
CHICAGO PNEUMATIC TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N.Y.

Pneumatic Tools • Air Compressors • Electric Tools • Diesel Engines
Rock Drills • Hydraulic Tools • Vacuum Pumps • Aviation Accessories



CP-500 PORTABLE COMPRESSOR SUPPLYING AIR FOR PILE DRIVING

Wherever there's need for air a CP Compressor will furnish it economically and reliably. The illustration shows how conveniently a CP-500 Portable Compressor can supply the air required for a heavy field job. The Gradual Speed Regulator adjusts engine speed to air demands, so that the engine never runs at any speed higher than necessary, effecting large savings in fuel and maintenance.



A HEAVY BLOW—WITH NO KICKBACK

CP-117 Demolition Tool has ample power for the heaviest type of work. Easy to handle; has no kickback; weighs 75 pounds with spring retainer, 78 pounds with latch retainer. Swivel air inlet prevents air hose from kinking.

SAVE TIME IN WOOD BORING

For drilling holes in piers or bulkheads, in trestle work, and for other similar applications, CP Pneumatic Rotary Wood Borers are great time-savers. Furnished in 1", 2" and 4" sizes; all reversible.

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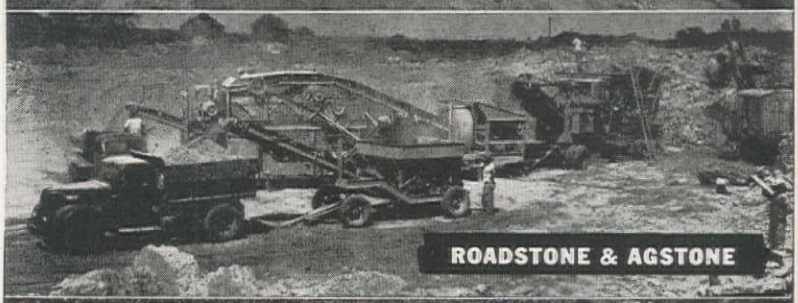
Cedarapids

Built by IOWA

Cedarapids Unitized Plant

the All-Purpose Portable Crushing, Screening and Washing Plant



Be wise—Unitize! You'll get a lower cost per ton because here is complete flexibility of setup for any and every job in the crushing field. Completely portable, adaptable to rock or gravel, produces the required number of finished sizes of aggregates, washes all or part of them when necessary, loads quickly into trucks or bins, travels over any road and can be set up right now and get to work immediately. With a Unitized Plant you can do a better and quicker job wherever aggregates are required *and at a lower cost.* Wide range of sizes to suit every contractor's requirements. When you buy a crushing plant, buy the best — buy Cedarapids. See your nearest Cedarapids dealer for all the facts.

THE IOWA LINE

of Material Handling Equipment is distributed by

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

PRODUCT OF IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

TELSMITH

VIBRO-KING

...a *new* VIBRATING SCREEN

for Mines, Quarries and Gravel Plants

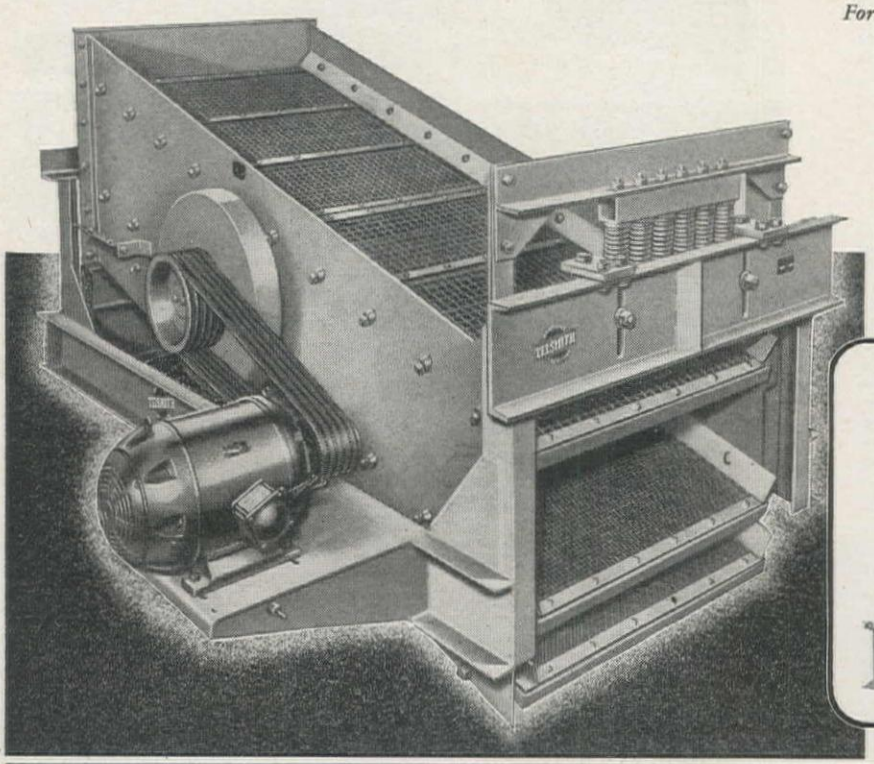
After six years of development, Telsmith now offers the new Vibro-King. To be sure they were *right*, 25 of these new screens were placed in operation in regular plants from coast to coast. During this test period—lasting four years—they handled all kinds of aggregates, under all sorts of conditions.

The first Vibro-King . . . sold in 1943 . . . is still running perfectly. Only the screen cloth was replaced. Not one of the others has had any major repairs. The high efficiency, freedom from shut-down, and exceptionally low upkeep of the Vibro-King have been tested *and* proved. Every user, without exception, is very well satisfied.

The Vibro-King has an intense circular vibration, uniform everywhere on the screen cloth, on all decks, and constant under any load. The vibrating unit is mounted on two heavy-duty roller bearings, in the center of the live screen frame. Two Telsmith-designed-and-patented, automatically adjusted, enclosed counterweights prevent "jumping" at critical speeds and assure exceptionally smooth performance at all operating speeds.

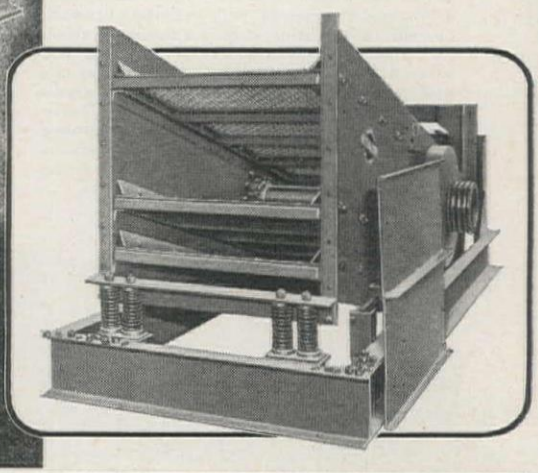
The main frame is horizontal for rigidity and ease of installation. Cable suspension, if desired. The vibrating frame floats on three nests of springs. Adjustment to the most efficient screening angle is quick and easy. Vibro-King Screens are made in five sizes, with 1, 2, or 3 decks.

For details, send for Bulletin V-30.



Changing Screen Cloth is Simple and Quick—The upper end of the Vibro-King is readily removable, making it a much easier job to change screen cloth and saving a great deal of time.

Screen Cloth Mounting—At customer's option—screen cloth may be mounted in rubber on steel screen trays; or stretched over steel screen supports protected by rubber—on any deck or decks. V-1



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.
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Gordon Russell, Ltd.
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TRUCK HOIST DUMPS TRAILMOBILE LOAD!

Providing the power for lifting the dump body of a trailer has always presented a problem. Utilizing a power take-off makes it a simple matter to dump the truck loads—it is another matter to dump a trailer load.

The three pictures shown here indicate how the S. H. Bacon Company of Huntington Park, California, handle the problem. They pick up sand and rock at Baldwin Park and deliver it to the ready-mix plant at Huntington Park, making four round trips daily of 50 miles each, working five days a week.

The Trailmobile shown above is the largest trailer which this company operates. They have been using it in this service since 1941, and they like its performance.

In operation, the truck drops the trailer, proceeds to location and dumps its own load. It then returns to the trailer, picks up the trailer load which is rolled into the truck body, then proceeds to location again to dump the trailer load.

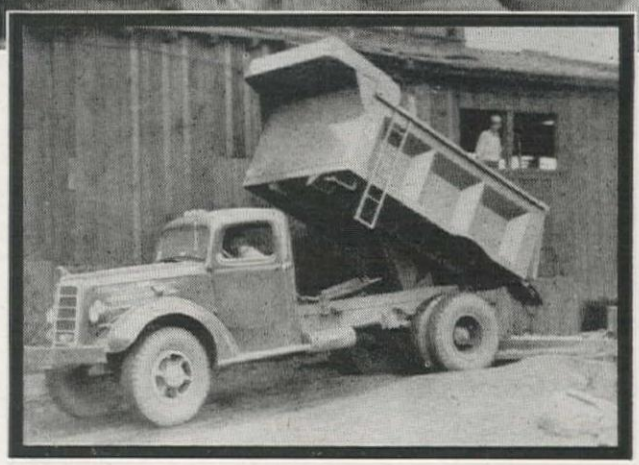
THE TRAILMOBILE COMPANY
BERKELEY, CALIFORNIA

TRAILMOBILE

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

STRIP-EASE!

You'll go a long way to find a hauling and dumping job as tough as that in the average strip mine operation . . . and you'll go just as far to find equipment as well fitted for this rugged service as Hercules Dump Bodies and Hydraulic Hoists. *There's* a combination that's built for business. If you've got a hauling and dumping job that's too much for ordinary equipment, you'll want to know all about Hercules heavy-duty bodies and hoists.



TOP—*It takes well-built equipment to stand up under the weight and impact of a load dropped by a dragline. This Hercules unit is one of a fleet operating in a Pennsylvania strip mine.*

BOTTOM—*Hercules equipment is designed for the job. This 6-yard capacity unit has special cab protector and is equipped with a Hercules 8X Hydraulic Hoist.*

DISTRIBUTED EXCLUSIVELY BY

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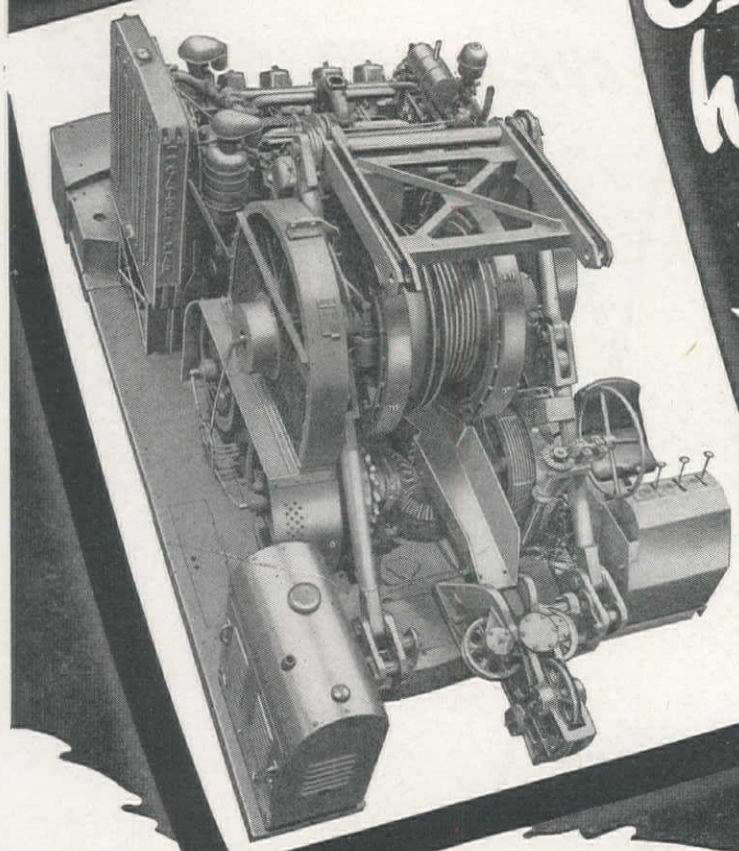
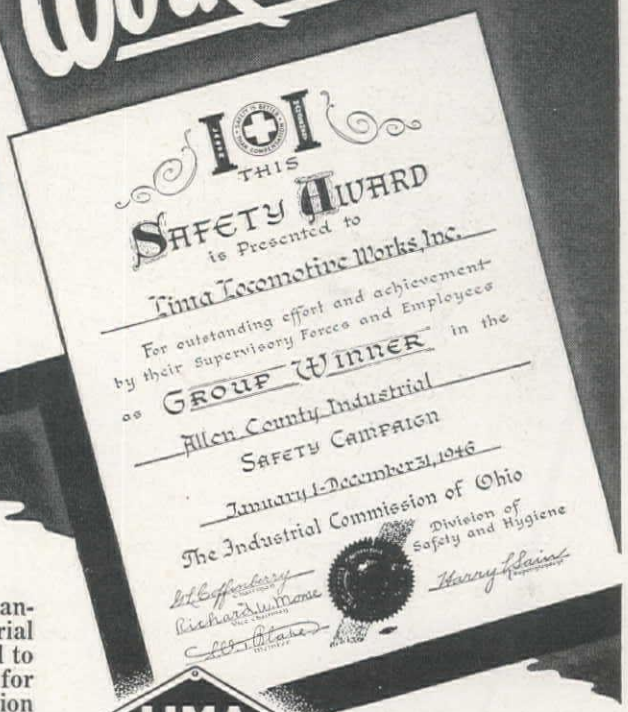
HERCULES DUMP BODIES *and* HYDRAULIC HOISTS

HERCULES STEEL PRODUCTS CORPORATION . . . GALION, OHIO

Safety goes hand in hand with Quality Workmanship





Safe working conditions go hand in hand with quality workmanship. This claim was recently substantiated when the Industrial Commission of Ohio, Division of Safety and Hygiene, awarded to Lima Locomotive Works, Incorporated, a certificate of merit for having the best safety record in the heavy industries division for 1946. In design and manufacture, LIMA has always taken every precaution to safeguard the men who work around LIMA machines. For instance, all exposed gears are protected by safety guards; platforms around the operator's position have safety treads; points of lubrication are centralized to eliminate oiling dangers and the compact arrangement of the machinery makes every part easily accessible. Be safe with a LIMA. Records prove that a safe machine produces greater output.

LIMA LOCOMOTIVE WORKS, INCORPORATED
Shovel and Crane Division **LIMA, OHIO, U.S.A.**
OFFICES IN PRINCIPAL CITIES

LIMA

THE LIMA DIAMOND
FOR OVER 75 YEARS AN
EMBLEM OF QUALITY WORKMANSHIP

LIMA

Capacities . . . SHOVELS ¾ YARD TO 5½ YARDS • CRANES 13 TONS TO 100 TONS • DRAGLINES VARIABLE

Our Seattle Office, 1932 First Avenue South, Seattle 4, Washington; Feenaughty Machinery Company, 112 S. E. Belmont St., Portland 14, Oregon; 600 Front St., Boise, Idaho; Our San Francisco Office, 1315 Howard St., San Francisco 3, California; Smith Booth Usher Company, P. O. Box 3578 Terminal Annex, Los Angeles 54, California; Held-McCoy Machinery Company, 3201 Brighton Blvd., Denver 5, Colorado; Smith Booth Usher Company, 1756 Grand Ave., Phoenix, Arizona; Contractors' Equipment and Supply Company, Springer Building, P. O. Box 456, Albuquerque, New Mexico; Modern Machinery Company, Inc., 4412 Trent Ave., Spokane 2, Washington; Jameson Engineering Sales, Fairbanks, Alaska.

"Buda Earth Drill whipped a most difficult foundation job!"

following are excerpts from a letter received from:

FOUNDATION COMPANY
OF
MISSISSIPPI
Jackson, Mississippi

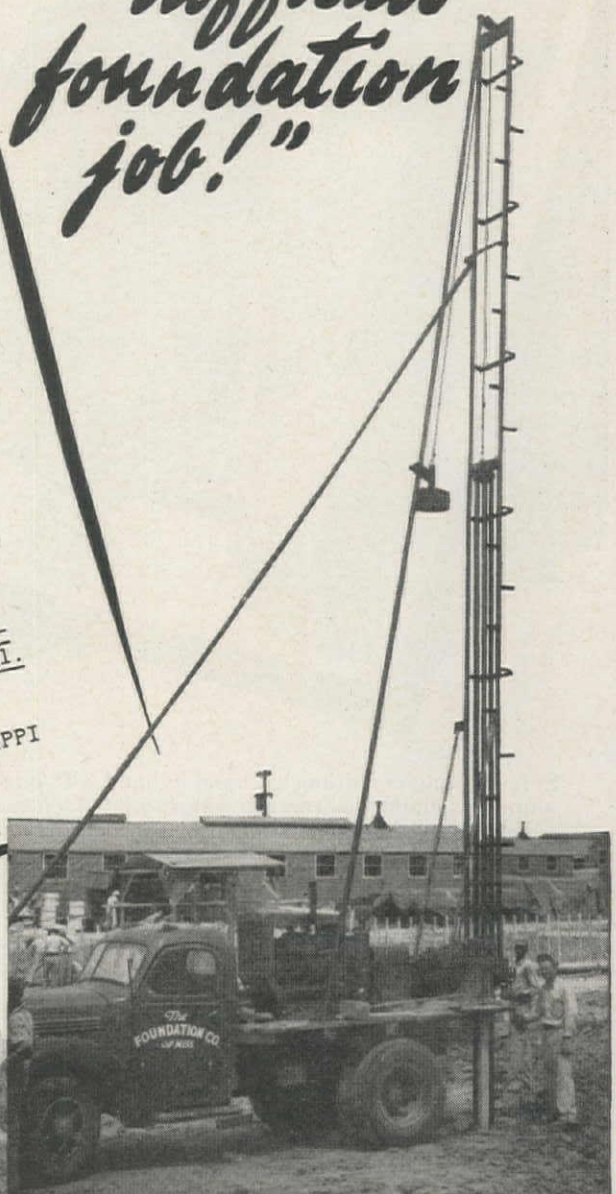
The Buda Company
Harvey, Illinois

Gentlemen:

...enclosed are pictures made of one of our BUDA drills on a most difficult foundation job...We have a condition here that has been a problem for years and every method known had been tried without success. But...we have developed a method with BUDA Drills that has overcome all difficulties. We have convinced ourselves as well as engineers and architects, including the U. S. Engineers, that we have whipped this situation.

This job had 91—16" piles 31' long and 135—12" piles 31' long. The 16" piles were all for outside walls and had spirals with 5-3/4 round rods; the 12" piles had 4-3/4" rods. This job was completed in thirty days with one BUDA Drill.

Yours very truly,
FOUNDATION COMPANY OF MISSISSIPPI
(Signed) J. W. Spence



Investigate the time and money-saving advantages of the full line of BUDA Earth Drill models.

Illustrated are full and close-up views of the BUDA Model HBE Earth Drill which put down 226 holes for 31 ft. piles, in 30 days, as outlined in the letter, above . . . a typical example of BUDA Earth Drill efficiency.

BUDA

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

See your nearest distributor

COAST EQUIPMENT COMPANY, 948 Bryant Street, San Francisco, Calif.; FORNACIARI COMPANY, 821 S. Santa Fe Avenue, Los Angeles 21, Calif.; BROWN-BEVIS EQUIPMENT COMPANY, 825 E. Madis, Phoenix, Arizona; RAY CORSON MACHINERY COMPANY, 1646 Wazme Street, Denver, Colorado; ARNOLD MACHINERY COMPANY, 153 W. 2nd Street, Salt Lake City, Utah; WESTERN CONSTRUCTION EQUIPMENT CO., 817 N. 29th Street, Billings, Montana; J. D. EVANS EQUIPMENT CO., Rapid City, South Dakota.

HIGH Concrete Pouring in TIGHT SPOTS

with the MULTIFOOTE Elevating Boom PAVER!

MultiFoote 34-E reaching over footings to pour footing caps on a new building foundation. Travel in tight spots and putting concrete where it's needed in big volume is a MultiFoote Elevating Boom Paver specialty.

Pouring full loads up to 18½ feet above ground level . . . maneuvering in tight spots . . . operating fast and easily on jobs *impossible* for most concrete pavers is routine for MultiFoote Elevating Boom Pavers. This is a concrete paver that can do a real job on all types of concrete construction work, as well as on straightaway paving . . . A machine that is big enough for the big jobs; and so economical in operation that small jobs are profitable, too.

The MultiFoote Elevating Boom is built for continuous operation on high pouring. Oversize clutches and brakes and special hoist transmission make this unit as dependable in use as the rest of the simple rugged MultiFoote Paver features.

Get full details from your MultiFoote Dealer—or write direct. Remember: *MultiFoote Elevating Boom Pavers are the only pavers built for continuous high pouring service.*

THE FOOTE COMPANY, INC.
1940 State Street
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MULTIFOOTE
CONCRETE PAVERS

SMITH BOOTH USHER CO.
Phoenix, Arizona
WESTERN EQUIPMENT CO.
Boise, Idaho, Spokane, Washington
THE COLORADO BUILDERS' SUPPLY CO.
Denver, Colorado
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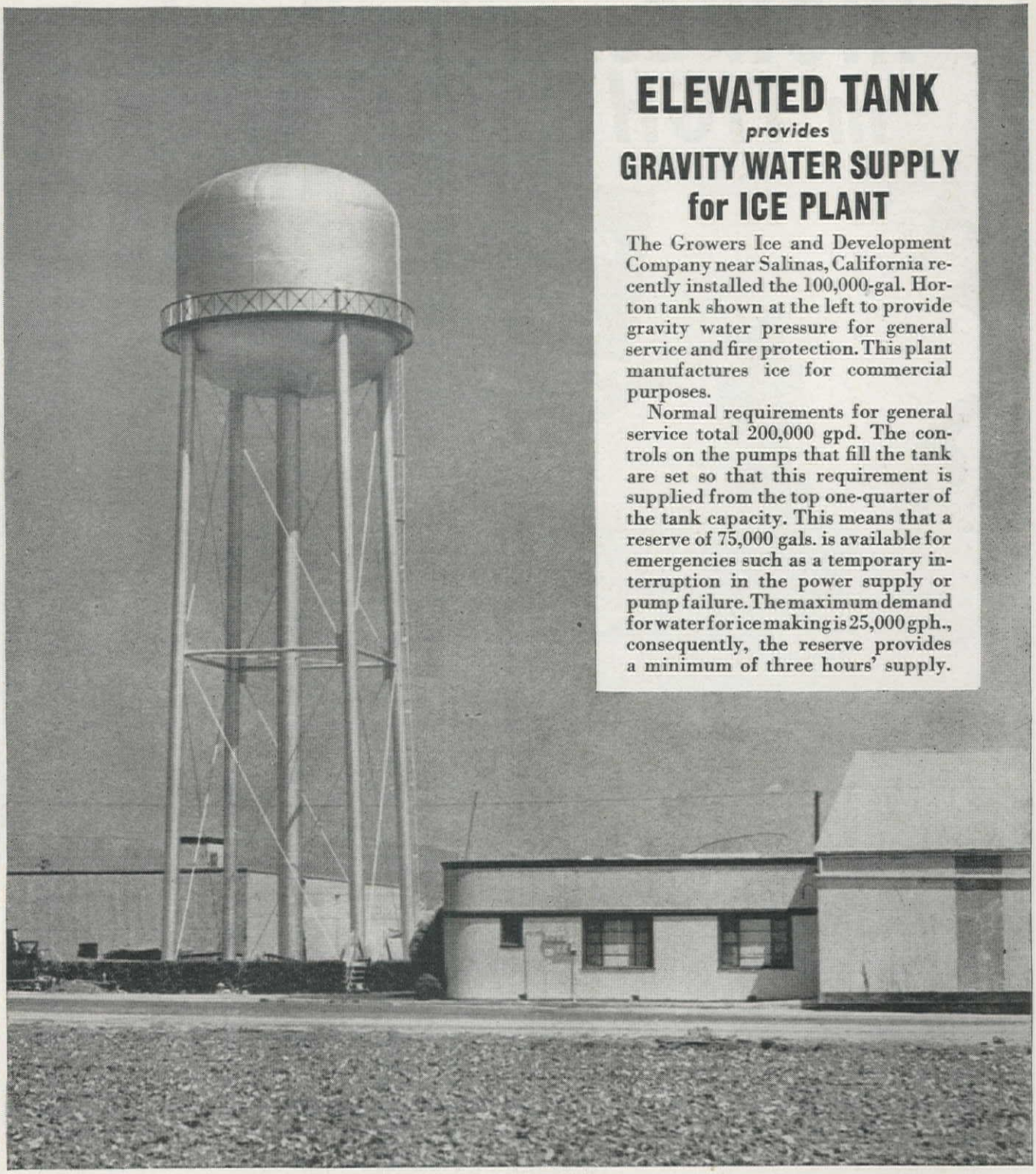
Albuquerque, New Mexico
THE LANG COMPANY, INC.
Salt Lake City, Utah
HOWARD-COOPER CORPORATION
Portland, Oregon, Albany, Eugene, Medford and Roseburg, Oregon, Seattle, Washington



ELEVATED TANK
provides
GRAVITY WATER SUPPLY for ICE PLANT

The Growers Ice and Development Company near Salinas, California recently installed the 100,000-gal. Horton tank shown at the left to provide gravity water pressure for general service and fire protection. This plant manufactures ice for commercial purposes.

Normal requirements for general service total 200,000 gpd. The controls on the pumps that fill the tank are set so that this requirement is supplied from the top one-quarter of the tank capacity. This means that a reserve of 75,000 gals. is available for emergencies such as a temporary interruption in the power supply or pump failure. The maximum demand for water for ice making is 25,000 gph., consequently, the reserve provides a minimum of three hours' supply.

• Horton elevated water tanks are widely used throughout the West to provide gravity water pressure for both industrial and municipal service. They are built in a wide range of capacities to meet governing specifications, and are designed to harmonize with their surroundings. When figuring on jobs that require elevated water storage tanks, write us for quotations.

CHICAGO BRIDGE & IRON COMPANY

San Francisco 11.....1213-22 Battery Street Bldg.	Los Angeles 14.....1444 Wm. Fox Bldg.	Birmingham 1.....1598 North Fiftieth Street
Chicago 4.....McCormick Bldg.	Philadelphia 3.....1700 Walnut St. Bldg.	Atlanta 3.....2183 Healey Bldg.
New York 6.....165 Broadway Bldg.	Tulsa 3.....Hunt Bldg.	Havana.....402 Abreu Bldg.
Cleveland 15.....Guildhall Bldg.	Detroit 26.....LaFayette Bldg.	Houston 1.....Clinton Drive

Plants in BIRMINGHAM, CHICAGO, and GREENVILLE, PENNA. *In Canada*—HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

May, 1947 Vol. 22, No. 5

Why Did They Confirm?

IT IS WITH a feeling of deep concern that we call to the attention of our readers the Senate vote which confirmed David Lilienthal, former socializer-TVA chief, as head of this nation's atomic energy commission. This commission was established to direct the development of and study about atomic energy and the atomic bomb. It should be the committee that will preserve for the United States alone the secret of the manufacture of this horrible instrument of death. Yet the Senate deliberately confirmed men for the controlling commission who were charged in the debate with loving Russia more than the United States, and who admit to being "sympathetic with" this greatest aggressor nation of all time.

That "Republican" Morse of Oregon and "Democrat" Taylor of Idaho would vote for Lilienthal was of course a foregone conclusion, for these men merely masquerade under the two party labels, in order that their socialist beliefs may not be paraded openly, where they may be seen by the voters, under the banner "Socialist." Also that confirmed New Dealers, such as Murray of Montana and McFarland of Arizona, nurtured and tutored in the belief that FDR was omnipotent and omniscient, should vote for confirmation was a cinch, for Lilienthal was one of "The Chief's" boys.

But utterly beyond the comprehension of this editor is the reasoning of such independent thinkers as Democrat O'Mahoney of Wyoming, Democrat Hayden of Arizona, and Republican Millikin of Colorado, who have consistently fought against Valley Authorities and other socialistic enterprises that Lilienthal has always stood for. Or by what conceivable misinterpretation of the 1946 elections, Republican Knowland of California or Democrat Chavez of New Mexico could vote for this man who believes in everything the voters acted against.

The damage is done now. We can but hope that Lilienthal and company will keep to themselves and for this nation alone the secrets with which they have been invested. To ask that they exclude from employment on the atomic project any Russian sympathizers is no doubt too much.

It DID Have Bugs!

WITH MUCH interest we note that the Secretaries of War and Navy have directed the special Board of Engineers which last January submitted a plan for a second crossing of San Francisco Bay, to reconvene and consider further into the matter. They are directed especially to investigate the cost of adding railroad facilities to the "roller-coaster" bridge-and-tunnel crossing they proposed, and also to study a report submitted by the Army and Navy in 1941, to see if rails could be added to that proposal.

So much criticism has been levelled at the Board because of its report that something had to be done to "save face." Having far exceeded their original authority in making the proposal, they are obliged to stick to it, but do find an out for reopening in the railroad question, which is one of the most important now facing San Francisco. The Board was originally authorized to study the Reber plan and any others which might be submitted as a solution to the critical Bay crossing problem. Instead of sitting as a judge, however, the Board itself submitted a plan, which was discussed in an editorial on page 126 of the February issue of *Western Construction News*, and reviewed in detail in the March issue.

No matter what the Board discovers about the cost of adding rails to the plan, it can never become an adequate solution to the problem. It does not connect the points of heavy traffic origin on the two sides of the Bay and would not adequately serve the population of either side. The Navy officer member of the Board who fought so hard to have the proposal called by his name may well be thankful that it does not, in view of the scorn and criticism which has been heaped upon it.

Who's Kidding Who?

YOU SEE SOME of the damnedest things in the papers!

But you'll seldom see anything funnier than the full-page ad appearing in the nation's newspapers on April 29 over the signature of the American Federation of Labor, and entitled, "A Free America cannot exist without Free Labor."

Now everyone (almost) concurs heartily with the sentiment of that statement. It is an obvious truth. But for an organization which shackles its members to a hitching post of mediocrity to make it, is the height of hypocrisy. "Free labor has made your America," reads a sub-head. "We need production NOW," reads another. Correct, in both instances, but how can this organization, which prevents freedom of labor and continually hampers production, say such things? Labor, shackled and deluded by conscienceless labor leaders is **today** forcing America to the brink of ruin. When, indeed, America needs production, labor deliberately **stops** production by refusing to work in mines, in steel mills, at telephone switchboards, in factories, on the ships, and on construction jobs.

Is labor free when masons are ordered by their union to restrict to a set number the bricks they may lay in a single day, that being supposedly the number the least able mason can set? Is labor free when a union member cannot find employment in his craft in any other town than his own, until all other union members in his new town are employed? Is labor free when a fully qualified craftsman is denied employment because he does not carry a union card? Is labor free when, granted the right to strike, it does not have the right **not to strike**? Is labor free when its members are forced to contribute time and money to political campaigns and other activities which may be directly opposed to their own beliefs? Is labor free when the number of apprentices is so limited by union order that a given craft cannot replenish its normal losses, and thousands of young Americans who are willing to work and desirous of a job are denied this simple right?

It is very, very true that "A Free America cannot exist without Free Labor." But . . .

A Great Convention

HIGHEST PRAISE is due the Arizona Section of the American Society of Civil Engineers for the fine style in which it entertained the Spring Meeting of the Society in Phoenix last month. It was the first time the organization had held a national meeting in the state, and the cordial reception and smooth-running machinery of the meeting caused delegates to hope that they could again convene there soon. In hotel accommodations, entertainment, transportation, program, even climate (for which the committee may not have been directly responsible!) the convention was tops.

To Walter Johannessen, Section president, Leigh Gardner, registration chairman, who worked so hard he made himself ill, Fred Guirey, entertainment chairman, John H. Gardiner, Director from Arizona, Clyde Myers, student activity chairman, and all the men and women who worked with them, a great deal of praise is due.

SURFACE SMOOTHNESS is its business

• Engineered from the ground up for precision operation, the Austin-Western Tandem Roller with its—

Variable Weight — **Rigid Box Frame**
Smooth Power — **Hydraulic Steer**
More Visibility — **Less Overhang**
More Clearance
Convenient Single or Dual Controls

meets all specifications for high-type surfaces . . . performs in a manner that satisfies the most exacting engineer.

The Austin-Western Line also includes 3-Wheeled Rollers. Catalogs yours for the asking.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS

ARIZONA—SMITH BOOTH USHER COMPANY.....*Phoenix*
CALIFORNIA—EDWARD R. BACON COMPANY.....*San Francisco 10*
CALIFORNIA—SMITH BOOTH USHER COMPANY.....*Los Angeles 54*
COLORADO—LIBERTY TRUCKS & PARTS COMPANY.....*Denver 1*
IDAHO—COLUMBIA EQUIPMENT COMPANY.....*Boise*
MONTANA—WESTERN CONSTRUCTION EQUIPMENT COMPANY.....*Billings*
MONTANA—WESTERN CONSTRUCTION EQUIPMENT COMPANY..*Missoula*
NEVADA—C. D. ROEDER EQUIPMENT COMPANY.....*Reno*
NEW MEXICO—N. C. RIBBLE COMPANY.....*Albuquerque*
OREGON—COLUMBIA EQUIPMENT COMPANY.....*Portland 14*
UTAH—WESTERN MACHINERY COMPANY.....*Salt Lake City 13*
WASHINGTON—COLUMBIA EQUIPMENT COMPANY.....*Seattle*
WYOMING—WILSON EQUIPMENT & SUPPLY COMPANY.....*Cheyenne*

FORMER RAILROAD bridge owned by Santa Fe Railway (left) over Colorado River at Topock, Ariz., has been redecked by State Highway Departments of the two states, to replace the very light steel arch span at right, which will be demolished. When this photo was taken, work was just starting on new rail bridge behind the bridge at left. It is now completed.

Red Rock Bridge—
Rail Span Redecked for Highway Use

Old Santa Fe railroad bridge between Arizona and California transformed by the two states into highway crossing by construction of adequate decking — Design for 1122-ft. structure carried out in the Arizona office — No structural change found necessary to fit bridge for new use

BRIDGING THE COLORADO River between California and Arizona is always a task requiring the utmost of engineering skill and science. The crossings are not numreous, Yuma 2, Parker, Blythe, Needles (Topock) 3, at the present time.

It has long been the desire of both highway and railroad engineers to cross the river at Needles, so that their facilities might connect directly between that California city and Oatman and Kingman on the Arizona side. The river channel at Needles, however, is several miles wide, much of this width being covered with slow-moving water in reed-choked channels, other portions dry except during periods of high water.

The Atlantic and Pacific Railway, antecedent of the Santa Fe, tried building a timber trestle across this wide expanse when the railroad first reached the river, but found it virtually impossible to maintain. It subsequently moved some 20 mi. downstream to the narrows at Red Rock Canyon, where a steel cantilever span was constructed. Subsequently a light steel arch highway bridge was erected a short distance downstream from the railroad span, and both the railroad and highway have been continuously obliged to make this long 20-mi. detour to cross the river.

During the war, the railroad constructed a new deck truss bridge a short distance north of the old bridge and realigned its approaches on both sides to secure more advantageous line and grade. The new bridge, a double track structure erected on concrete piers of record depth was described in *Western Construction News* for March, 1945 and August, 1945.

When this new bridge was completed, the Santa Fe Railway made a gift of the old cantilever bridge to the two states to be redecked and to replace the old highway structure which was too light for present day traffic, and was further endangered because water rising back of Parker Dam had covered the concrete footings and was wetting the lower steel members.

The bridge was accepted by the two states, and the Arizona Bridge Department, under the direction of R. A. Hoffman, state bridge engineer, undertook the task of designing an adequate decking to transform the bridge from rail to highway use. The State of California participated in all expense to the extent of 50 per cent, but design was carried out in the Arizona office. A contract was let to H. L. Royden of Phoenix, Ariz., for construction of the new deck.

Design of new deck

The old cantilever bridge has an overall length of 1122 ft. The central cantilever span has a length of 660 ft., and at the center of this the railway had added a concrete pier in 1910 when traffic load increased seriously, at a rumored cost of $750,000. A study of the structural design of the bridge indicated that no change was necessary to fit it for its new use, and in fact that certain longitudinal reinforcing rods which had been

added could be removed, since a much less concentration of weight would now be stressing the bridge. The removal of these rods permitted additional width in the finished roadway.

The new road has a width of 20.5 ft. between railings, with 19 ft. of clear roadway between curbs. This utilizes virtually all the available space between the trusses, which are constructed on 25-ft. centers.

The new floor is raised above the old deck level, in order to avoid the necessity of trimming the lateral bracing gussets connecting the trusses and floor system. This raise was accomplished by welding 14-in. wide-flange chairs onto the outer stringers of the old railroad floor system. This old system had four longitudinal stringers, but for the new deck only the two outside such members were used. The chairs, in turn, supported transverse beams, 14 in. deep, on 5½-ft. centers. On these the new concrete floor was constructed. The slab being 7 in. thick, the total raise from the original floor level was 35 in.

To distribute the live load on the cantilever ends of these transverse beams, a 15-in. channel was welded to the outward end of each, where it also served as the outside form for the concrete later poured in the curb.

Special features

A welded steel handrail was erected on each side of the roadway. It was built up of a 4-in. wide-flange post with a 4 x 6-in. angle at the top and a 4-in. tee for the mid-rail. The posts were welded to the curb beam, the whole beam and rail system being fabricated in panels in the shop and shipped to the job complete for installation. The beam chairs were field welded to the tops of the stringers, but the transverse beams were riveted to the tops of the chairs, this being the only riveting on the entire job. The purpose here was to avoid any bending stresses which might tend to break a welded joint.

A ¾-in. steel anchor rod was installed at each transverse beam between the top flange of the beam and the curb beam as reinforcement and to avoid the possibility of cracking off the curb from the floor paving.

The original design of the bridge included one floating section at each end of the cantilever. The original stringers and side members were hinged to permit expansion and contraction and expansion devices were placed in the new decking. These consisted of two 3⅜-in. wide flange tees with the web set vertically. One was made the end member of the floor slab of the rigid section, the flange being continuous with the paving of the floor. The other was made the end member of the floor slab of the floating section, but the flange was depressed below the floor elevation to the thickness of the flange of the other tee, thus permitting it to slip under it to care for the expansion. A total of 1¼ in. of movement is thus allowed for at each end.

The panel lengths on the structure are 27½ ft. throughout, except for the Arizona approach span where there are four 30-ft. sections. The three end panels on the California end were superelevated to match that on the highway approach curve.

Contractor's methods

The contractor erected the steel on one-half of the bridge from each end, and field welding progressed immediately behind the steel placement. To convey the beams and other steel to their proper position, he built a track in the center of the bridge from the old handrails of the structure, and constructed a special tram-car upon which the material was carried. A small boom crane fitted to operate underneath the bridge cross members was used to make the final setting of the beams.

When steel erection was completed, plywood form panels for the floor paving were installed, being supported on the lower flanges of the transverse beams. When the concrete had set, these panels were then slid out the ends of the section and moved ahead for re-use.

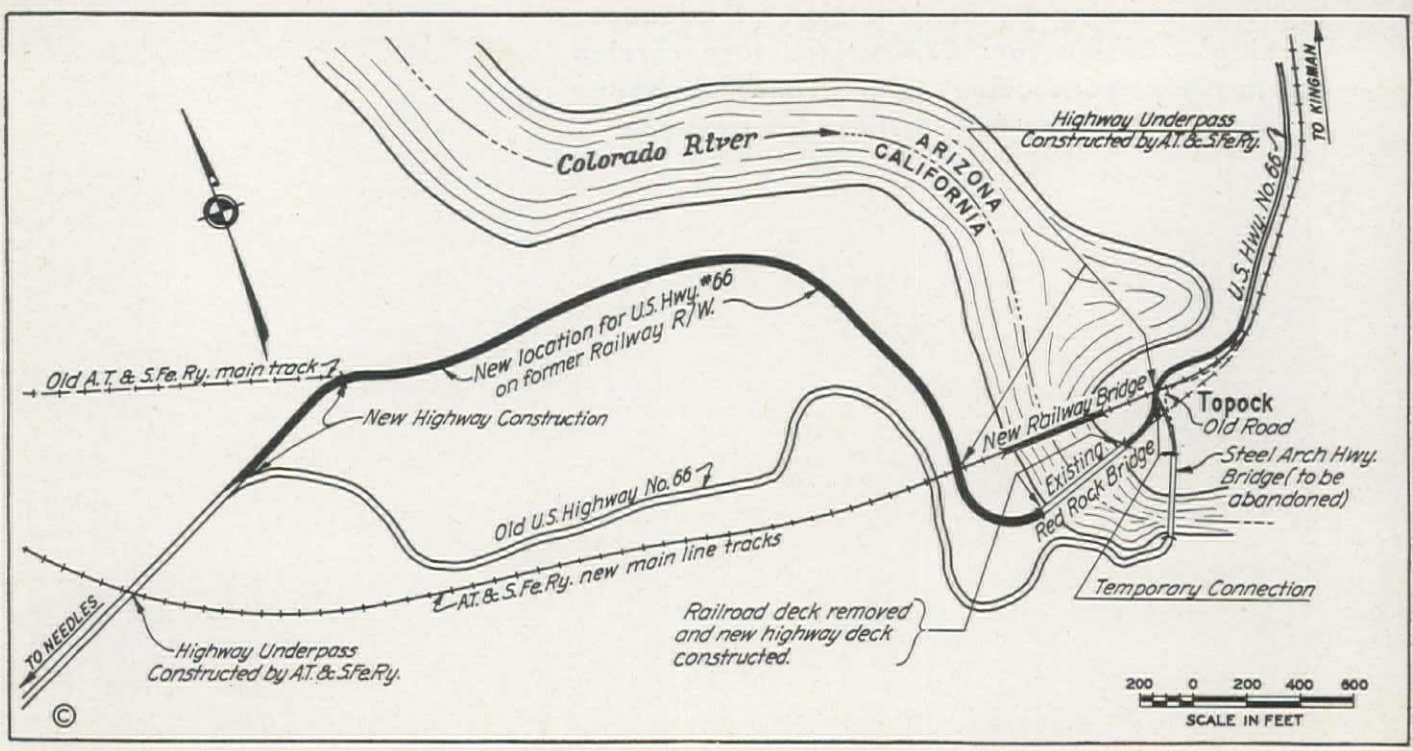
The concrete was poured in three main sections, all from the Arizona end, as more room was available there for operations. A weigh-batching plant was charged by a skip loader mounted on a tractor. After mixing, the concrete was dumped into concrete buggies, and a train of these would then be pulled to the point of placement by a three-wheeled motor buggy over the already completed floor. The contractor found labor very difficult to secure and made full use of every available mechanical operation.

Steel, both for reinforced and structural members was supplied and fabricated by Allison Steel Co. of Phoenix and trucked to the job.

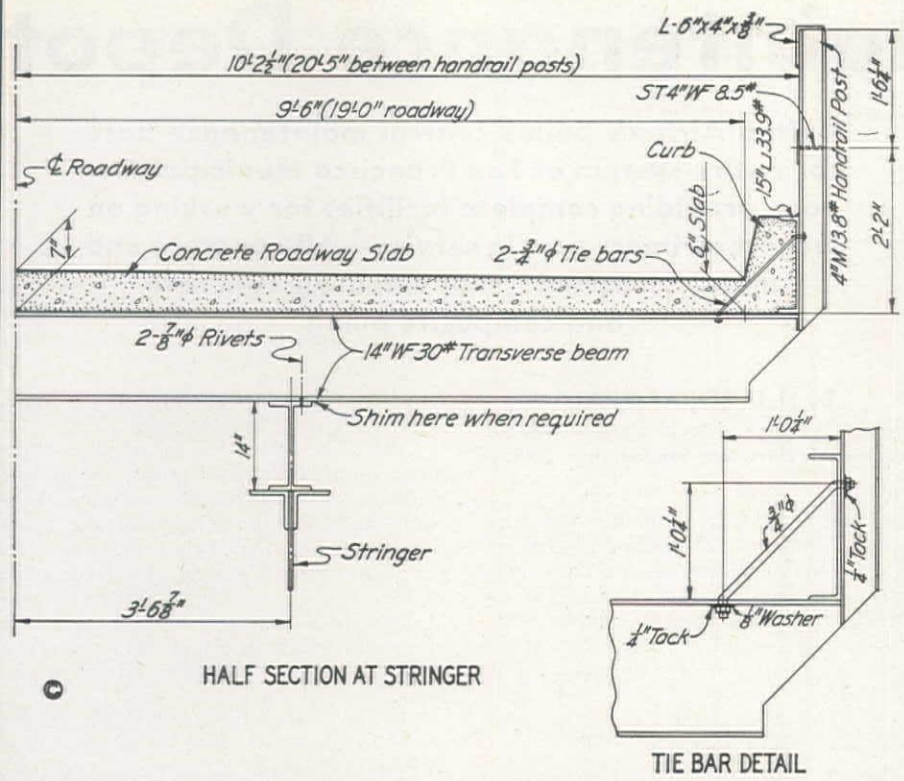
Incidental features

The new floor was designed for AASHO loading specification H15-S12. A concrete of 3,000-lb. strength was specified.

New approaches are necessary at each end of the new crossing. On the California end the old railing right-of-way will be used for about 1½ mi., with a short connection to the existing highway, and on the Arizona end, 2,027 ft. of new roadway will be required. Contract for the California work was recently awarded to Arthur A. Johnson, Laguna Beach, Calif., while the Arizona construction will be done by force ac-



LOCATION MAP of the bridges at Topock, Ariz. When the Santa Fe constructed its new railroad bridge and re-aligned its approaches, it turned over the old railroad bridge and approaches to the states, so both railroad and highway are improved.



HALF CROSS-SECTION of the new decking on the Red Rock bridge. Only two of the four original stringers of the railroad bridge were used. I-beam chairs on top of the stringers raised the deck high enough to avoid cutting lateral bracing gussets.

count. On both sides the roadway will be an oil pavement, of 2-lanes width.

At the time the new railroad bridge was built and new railway approaches constructed, overpasses were built by the Santa Fe on each end at the location of the new highway approaches.

For the Arizona State Highway Department, R. A. Hoffman is bridge engineer, and was in charge of design. At the bridge, Frank Berg is resident engineer, under Ed Mays, district engineer. For the California Division of Highways, Fred W. Panhorst is bridge engineer, and Jack Green supervised the work. For H. L. Royden, the contractor, W. C. "Woody" Claypool was general superintendent.

Total cost of the bridge redecking amounted to $71,500 including engineering. It was completed on May 1, but the new approaches are not yet constructed.

27 Million Dollar Australian Dam Proposed for Water Conservation

THE LARGEST and most spectacular water conservation project ever to be undertaken in Australia, a vast engineering scheme unique in Australia's history, is the proposed construction of a dam at the Eildon Weir on the Goulburn River in Victoria.

More than usual interest has been aroused in the scheme not only because of the benefits that the storage of water will bring to land holders but because it has also been the subject of investigation by one of the world's greatest engineers, Dr. J. L. Savage, famed for his planning of Boulder Dam and the Grand Coulee Dam.

Cost of the Eildon Dam is estimated at approximately $27,840,000. The project is being planned in detail by the Victorian State Rivers and Water-Supply Commission.

It is proposed to increase the capacity of existing storage on the Goulburn River to four times that at present provided. This will enable local irrigation areas to be doubled, and will consequently enhance the value and production of land now used as pasture, farm and orchard country.

The benefits to the surrounding areas are similar to those created by the great Australian irrigation scheme at Mildura, on the River Murray, which was put into effect by the Chaffey Brothers, of the United States of America, half a century ago.

Fundamental basis of the Eildon project is the increase of the area of the present Eildon Reservoir from 306,000 to 2,350,000 ac. ft. The wall of the enlarged dam will be 3,300 ft. long and 250 ft. high. Its construction will provide work for more than 1,000 men for six years. It is estimated that the area of 320,000 ac. of irrigated land served by the present dam will be increased fourfold.

Dr. Savage's recent report on the Eildon project has generally endorsed the plans of the Commission's engineers.

Washington Power Lines To Be Patrolled by Air

AIR PATROL of the 2,000 mi. of transmission lines operated by the Bonneville Power Administration was undertaken last month on an experimental basis. For the next three months the lines will be patrolled by helicopter under a contract awarded to the Central Aircraft Co., operated by Herman Poulin at Yakima, Wash.

The contract calls for 120 hr. of flying time during the 3-month period at a bid price of $50 per hr. Standby time will cost $22.50 per hr., and will provide for occasions when a helicopter will be required to wait for more than an hour while line crews are making repairs. The helicopter patrol will first be used in eastern Washington, then on the Cascade Mountain crossings, and later on the west slopes.

Preliminary demonstrations of the helicopter patrol have indicated that it should be possible to work out an economic system of patrol and repair. Two of the main advantages expected are spotting of incipient trouble before service is interrupted, and rushing repair crews to remote spots on the lines in a matter of minutes rather than the hours and sometimes days now required.

Construction Begins on Canadian Diversion Dam

CONSTRUCTION has commenced on the new $1,800,000 diversion dam which is part of the $50,000,000 Bridge River power development program of the British Columbia Electric Railway Co. The dam is being built 130 mi. north of Vancouver, and general contract has been placed with the Northern Construction Co. and J. W. Stewart, Ltd.

Water will be diverted from Bridge River through a tunnel under Mission Mountain to Seton Lake about 1,200 ft. lower in elevation. Construction of a new power house will also be undertaken at Seton Lake and contract has been placed with the Northern Construction Co. and Hume & Humble, Ltd., for the building of a high tension line from Seton Lake to Vancouver, at a cost of $2,500,000.

Construction of the cofferdam is at present providing employment for 240 men. This dam is of earth and rock fill, with a core of steel sheet, and will be 60 ft. high at its highest point.

As a result of the erection of the dam, part of the present Bridge River-Pioneer highway will be flooded and the relocation of the road and erection of a new bridge is necessary.

An important item in connection with the construction program is the hauling of 12,000 tons of equipment over twisting mountain roads which climb 3,000 ft. in five miles and descend 2,000 ft. in the next four.

A portion of the work of clearing 30 mi. of transmission line right-of-way and installation of footings for steel towers has been placed with the Jamieson Construction Co., of Vancouver.

Airliner Maintenance Depot

United Airlines builds central maintenance base for entire system at San Francisco Municipal Airport, providing complete facilities for working on largest airliners now in service—All-concrete and metal structures supported on concrete and composite piling

By N. D. BORATYNSKI
Engineer in Charge of Construction and Design, United Air Lines, Inc., San Francisco, Calif.

WITH THE TREMENDOUS expansion of airline operations, both at present and in the near future, it has become of immediate importance to expand ground facilities to keep pace with the advances made in the air. United Air Lines has faced this problem and has now under construction at the San Francisco Municipal Airport, a multi-million dollar expansion of its Maintenance Base. The facilities of the base will have a great deal of effect on the economics of airline operation. The success of an airline depends largely on the routes covered, the choice of new aircraft and the facilities of the maintenance organization. The domestic routes of the major airlines are more or less fixed by the Civil Aeronautics Administration and the choice of new airplanes has been made and the orders placed. Therefore, it next remains to provide a maintenance base most suitable to the airplane equipment and to the airline route structure. United Air Lines has elected to concentrate its maintenance at one base, centrally located with respect to its system and having a moderate climate. San Francisco is considered the heart of the system, since its lines run four directions from that point — to Hawaii, Seattle, New York, and Los Angeles.

Like any other design and development of an industrial plant, an airline maintenance base requires a very thorough study and knowledge of the functions to be performed therein. However, the planning and design of a large base such as United Air Lines' San Francisco Maintenance Base, probably presents more of a challenge to the engineering profession than most industrial problems.

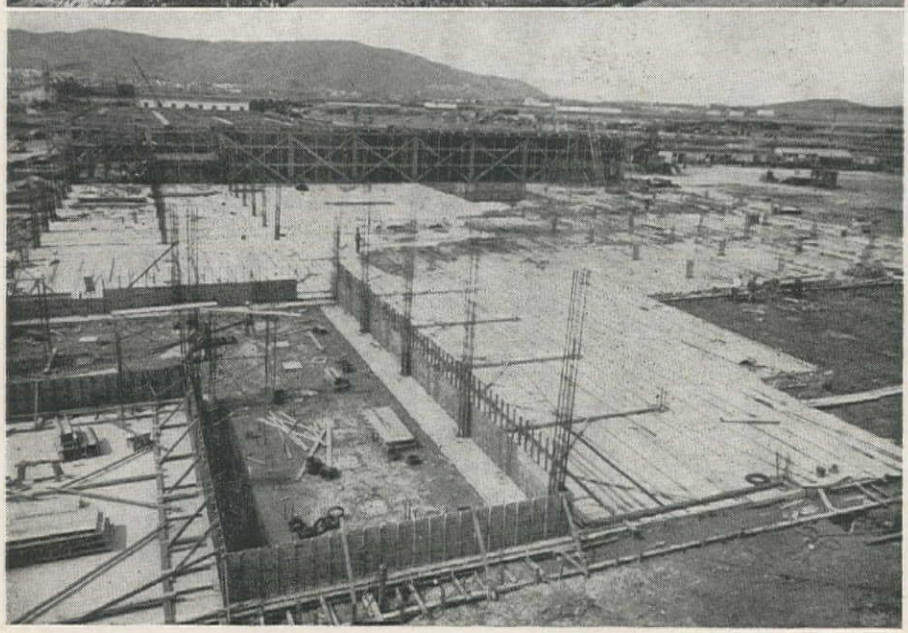
The processes involved in the complete overhaul of modern aircraft are quite complex and as a rule do not lend themselves to production line methods. The site planning of the buildings involved usually is limited by the boundaries of the airport, existing aprons, taxiways, and runways, and the fact that the shape of the aircraft establishes definite dimensions of the hangars in which they are to be housed during overhaul. The latter can be further complicated if more than one type of aircraft is to be considered.

The design of the maintenance base was made to accommodate the overhauling of four types of plane, namely the Douglas DC-4 and DC-6, Martin 303 and Boeing 377, being the first DC-6 servicing plant in the country. The base essentially consists of four major structures . . . main shop and office building, drop hammer and welding shop, hangars, and engine test cell building.

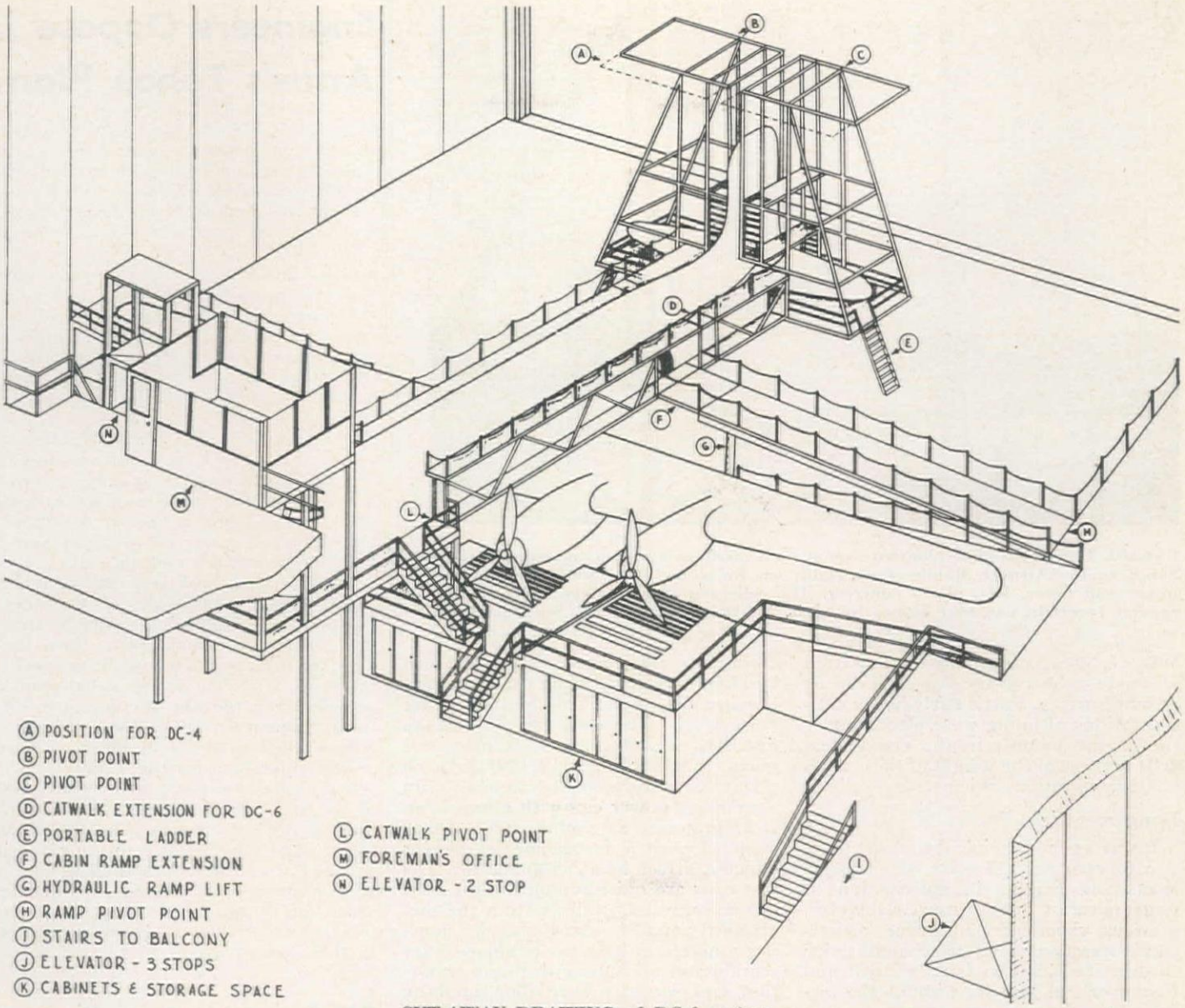
Shop building

The shop building consists of two stories and mezzanine with a balcony running the entire length of the structure at the second story elevation, thereby connecting the hangars with one continuous elevated freeway. The first floor will be occupied by the following: engine overhaul, plane overhaul, plating, machine and sheet metal shops.

Even though the first floor of the building is segregated into these areas, the shops themselves are separated from one another by movable screen partitions, thereby making possible the alteration of shape and location of the shops to accommodate future improvements in the methods of overhaul. The location of all shops is determined by their mutual relationships to one another and



PROGRESS PHOTOS on main shop building for UAL maintenance base. Upper photo shows grading completed and piles being driven, while lower picture shows floor slab poured and forms set for walls.



CUT-AWAY DRAWING of DC-6 maintenance shop, showing both permanent and movable working facilities. All parts of the structure are concrete or metal, no wood or other inflammable materials being used anywhere in the building.

to their individual assembly lines as well as their accessibility to stockrooms and from the inspection and rework stations of each shop.

The most complex activity of the first floor is concentrated in the engine overhaul shop which is supplied with fast and slow moving conveyor chains, automatic engine parts washing machines, floor recessed hydraulic engine lifts, elevators, etc.

Additional facilities

The second floor of the building will accommodate the following: radio, electric and instrument, cabin overhaul, and accessory shops. It will also provide space for a stockroom and for engineering and executive offices. The most interesting shops on the second floor, from a technical point of view, are the radio, electric and instrument shops, because of the extensive electrical and vacuum distribution networks of various potentials, cyclage and vacuum intensities. The instrument shop, in particular, is ventilated through an ionizing filtration system to prevent even the smallest particles of dust from entering this area.

The mezzanine of the building will consist of three separate "islands," and will accommodate locker rooms, toilet and washrooms, and areas to be occupied by functions such as first aid, recreation rooms, lunch rooms, and complete photographic laboratory. These "islands" will be located so as to provide a direct means of access from each shop to the above facilities, thereby reducing unnecessary traffic through the premises.

Structural design

Structurally, the shop building consists of a 9-in. reinforced concrete "flat slab" and spirally reinforced concrete columns with steel "jack-knife" sawtooth truss above the second floor. The entire exterior of the building is constructed of corrugated "Transite" and the fenestration consists of steel sash and radiation resistant glass. It will be well to point out that this portion of the structure is designed without the use of millwork, namely, all office partitions, doors, etc., are constructed of pressed steel and fluted glass.

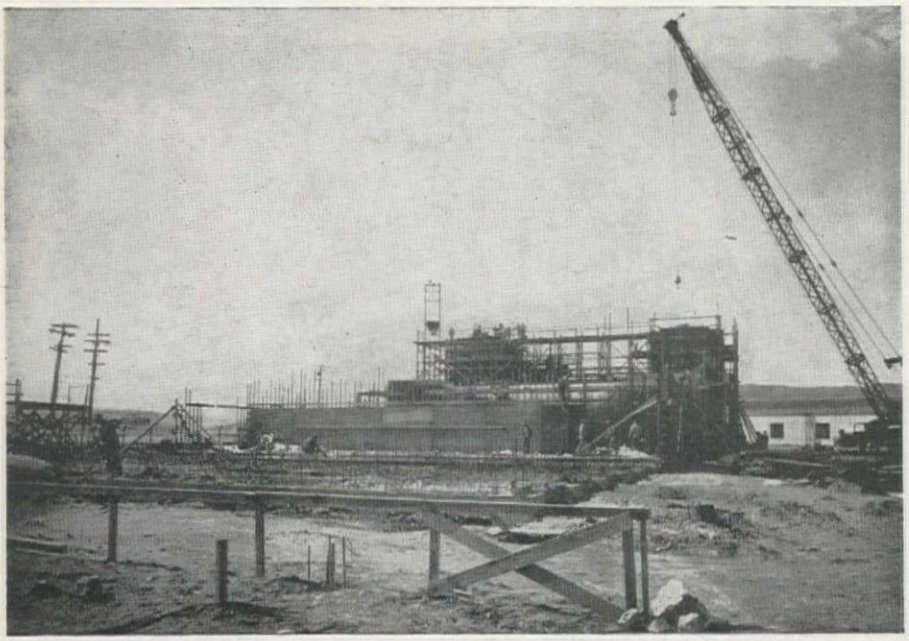
Metal forms are used in pouring the flat slabs and give a sufficiently smooth surface, without any further finishing. All concrete is dry-batched, and mixed on the site in Mixermobile elevating mixers. The towers which are integral with these machines facilitate pouring of columns and upper floors with a minimum of hauling.

The steel trusses are fabricated in the east, and raised into place by rubber-tired mobile crane. The roof will be a steel deck insulated with glass wool.

Foundation problems

Owing to the fact that San Francisco Municipal Airport is built entirely on spongy silt, partly natural accumulation of mud, and partly man-made fill, the conditions for foundation of this heavy maintenance structure are very uncertain, and the entire base is supported on piling, the spacing being determined by the load, vibration, etc., of the several portions of the base.

Under columns, Raymond concrete piling were driven, while under other portions, composite piles were utilized.



ENGINE TEST cells under construction at the United Air Lines maintenance shop at San Francisco Airport. Mobile crane, right, sets forms and steel, while Mixermobile mixer and tower, left, places concrete. The cells are of extremely heavy design. Special forms in use were shown in April, *Western Construction News*, page 98.

While a great variation of penetration was noted, the average was 42 ft. below ground surface. Particularly heavy concentrations of piling were placed under the engine mounts in the engine test cells because of the weight of these units and the vibration anticipated.

Hangars

It was a general tendency in past practice to construct hangars of excessive spans and heights in anticipation of larger aircraft of the future. However, previous experience in airline maintenance operation shows that the utilization of oversized hangars is very slight and that overhaul activity around the aircraft loses its compactness, thereby becoming less efficient. At present, it is difficult to out-guess the sizes of future airplanes and, therefore, when the design of the San Francisco Maintenance Base was conceived it was determined that the most practical solution to the problem was to construct hangars just large enough to accommodate the aircraft which it is intended to operate at present. If, however, in the future the line should acquire an airplane requiring a larger span hangar, the hangar will be constructed to accommodate it when the need arises.

The hangars are of a conventional steel truss design separated from one another by firewalls with necessary fire doors to accommodate second and ground floor freeways and connecting them to the shop building entries. Each hangar is supplied with a dock designed to greatly facilitate the overhaul of aircraft. Each dock accommodates one type of airplane and is connected by means of stairways, elevators, hydraulically operated ramps, etc. to the balcony off the second floor of the shop building.

Test cell building

This building consists of six 16-ft. cylindrical "U" type test cells and one carburetor test house. This test cell building is removed from the main base because of fire hazards and excessive noise levels. The cells are designed to test the following Pratt & Whitney engines: R2000, R2800 and R4360 and each cell is instrumented and designed to run a complete power egg with a cut down B-29 propeller as a club. Each cell is supplied with a forced air jet blower which is driven by a 250-hp. motor. The test cells are quite complex, both from the structural as well as from the mechanical point of view. Forms for pouring concrete in both the circular center section and the square-to-round transition end sections were illustrated on page 98 of *Western Construction News* for April, 1947.

The carburetor test house consists of a single concrete structure which accommodates a Bendix air box driven by four 125-hp. pumps, which unit is used for carburetor mixture adjustment prior to installation on the engine, various test equipment such as flow benches, etc. All electrical equipment within this building is explosion-proof and the entire structure is supplied with a carbon dioxide fire protection system.

Future expansion

In conclusion it should be pointed out that the main shop and office building and the hangars are designed in such a way that future expansion of the base will be made northward as the need arises. Attention should be focused on the fact that even though the hangars and shop and office building forms one unit, they are completely independent of one another, both dimensionally as well as structurally.

The over-all planning and design has been accomplished through the close cooperation of the United Air Lines' staff and the Oakland, Calif., office of The Austin Company, engineers and builders.

Engineers Oppose Army's Tahoe Plan

UNANIMOUS OPPOSITION to plans of army engineers to lower the level of Lake Tahoe and build a new reservoir on Prosser Creek was expressed by directors and engineers of the Truckee-Carson Irrigation District at a meeting held recently.

The plan, which would permanently lower the level of Lake Tahoe by 1.4 ft., thus losing nearly 170,000 ac. ft. of storage facilities, was also criticized by other state officials and engineers who deemed it "unrealistic as far as accomplishing anything constructive for the water users of Nevada."

A new reservoir of 135,000-ac. ft. capacity on Prosser Creek with a connecting canal of 500-sec. ft. capacity was proposed by the army plan to offset the loss of water at Lake Tahoe. It was contended that the new reservoir would provide flood control for Reno.

It was stated, however, that no flood relief would be brought about, since most flood conditions are caused by tributary streams which pour into the Truckee from points below the proposed reservoir. The 500-sec. ft. canal would also do little to take the pressure off further upstream since flood stage involves a flow of about 14,000 sec. ft.

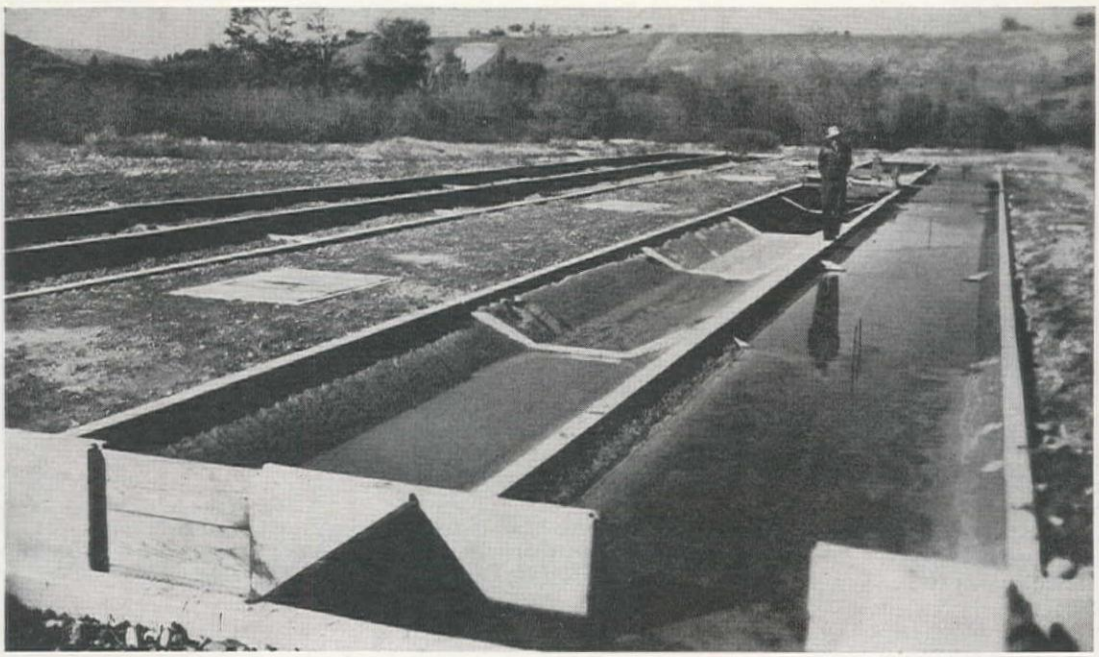
The spokesmen for the Truckee-Carson group also stated that another part of the plan, which involved removal of part of the reefs which partially block the river at the entrance to the canyon at Vista, would be impractical. It might provide some flood relief to the Glendale area, but it would be accomplished at the expense of adding serious problems further downstream.

Bill Passed to Install Water Meters in Nevada

A BILL permitting installation of water meters in areas of certain population in Nevada where excessive waste of water by individuals can be proven to the satisfaction of the public service commission was approved by the Nevada state legislature at a recent meeting. Only one vote against the proposal, which would concern only Reno, Sparks, and Las Vegas, was cast.

Reno has the largest per capita consumption of water of any city, town or municipality in the United States, explained E. Fandsen Loomis, who sponsored the bill. Need for the bill has been shown through the previous passage in the Senate of a bill authorizing surveys in the Lake Tahoe watersheds designed to protect existing water resources and to develop supplemental sources, it was stated.

With continued growth of the population in the Lake Tahoe area, it was explained, without passage of such a bill, Reno might shortly face a serious water problem. The average Reno resident uses approximately 800 gal. of water daily.



West's Canal Linings Studied

Investigations made at Utah College to determine best way to utilize West's meagre water supply—Information of best methods and materials for lining canals studied as a way to prevent seepage losses from water conveyances, which cause one-third of irrigation wastes

By C. W. LAURITZEN
Soil Technologist, Soil Conservation Service
and O. W. ISRAELSEN
Research Professor of Irrigation and Drainage, Utah Agricultural Experiment Station

THERE IS MORE land in the West suitable for irrigation than there is water with which to irrigate it. It is therefore essential that none of the meagre available supply be wasted. The best information available shows the disposition of water diverted from streams and reservoirs for irrigation to be about as follows:

1. One-third utilized by plants in the production of crops.
2. One-third lost through deep percolation and runoff.
3. One-third lost through seepage in conveyance from rivers to farms.

Losses of water from the irrigated farms through deep percolation and runoff can be reduced through increased efficiency in water application. Seepage losses from canals may be largely eliminated through the lining of the canals. Recognizing the seriousness of seepage losses, and a need for information on methods and materials for lining canals, the Soil Conservation Service and the Utah Agricultural Experiment Station recently intensified their investigation of water conveyance problems.

Laboratory

To facilitate a phase of this work which might be classed, in part, as the model testing of canal linings, an outdoor laboratory was constructed in 1945. The laboratory is located on the Logan River near the mouth of Logan Canyon, one mile east of the Utah State Agricultural College.

The principal feature of the laboratory is the four channels simulating irrigation canals. The channels have bed widths of 3 ft., side slopes of 2 horizontal to 1 vertical, top widths of 9 ft. and lengths of 160 ft. Each channel is divided into eight sections, and each section is provided with independent underdrainage facilities to collect and measure seepage losses. The channel stream is continuous, making it necessary to operate each channel as a unit. In cross section the experimental channels consist of a trapezoidal concrete seepage intercepting basin, in the center of which is a 2-in. perforated pipe.

Resting on the concrete, and over the pipe, is an 8-in. mat of washed and graded gravel. This gravel mat serves as a support for the canal linings and as a highly-permeable medium for conveying the seepage water to the perforated pipe and thence to the outlets where it can be collected and measured. The channels are level and the stream used is small, not greater than 0.5 cu. ft. per sec., just sufficient to eliminate dead water. The water cross section in the work to date was 4 sq. ft., hence, the mean velocity of the stream was only 1/8 ft. per sec.

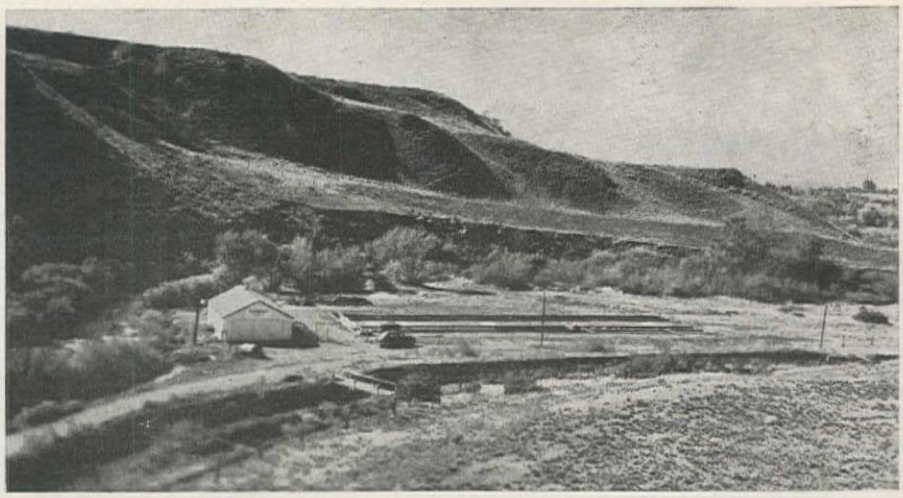
Factors investigated

Present outdoor laboratory facilities are expected to provide information on the permeability of linings constructed from a variety of materials, the rate at which the linings deteriorate, and a basis for extending data on physical properties of materials to field practice. Many of the practical problems of lining, such as the development of equipment and methods for field construction, susceptibility to mechanical injury from livestock, rodents, weed growth, and cleaning operations, can be solved only by supplementing the information obtained in the laboratory by field trials. As the work at this laboratory progresses, it is planned to undertake some of these in cooperation with the Operations Division of the Soil Conservation Service, with irrigation companies, and any others who may be interested in lining canals.

The erosion factor is outside the range of present facilities for experimental work. Sometime in the future, additions to the laboratory may make it possible to include the erosion factor. This factor is not being neglected entirely. The susceptibility of various lining materials to erosion due to stream characteristics, such as water velocity, is being studied on a limited scale through the facility of a flume located in the college hydraulic

laboratory in the Engineering Building.

The water supply for the laboratory is obtained from the Logan Northern Irrigation Co. canal. Arrangement with the canal company provides for the delivery of any size stream up to 50 cu. ft. per sec., and there is a difference of approximately 15 ft. between the elevation of the water in the canal above the laboratory and the water in the river below. The quantity and the head available thus provide the opportunity of extending the investigations to include a study of the erosion factor and other hydraulic problems associated with the conveyance of irrigation water.



EXPERIMENTAL laboratory, located on the Logan river, principal feature of which is the four channels simulating irrigation canals. Channels have bed widths of 3 ft. and lengths of 160 ft. Each channel is divided into eight separate sections.

Preliminary results

Experimental canal linings have been installed in channel A and material placed for a similar set in channel B. The linings were shaped with a screed and compacted by means of a pneumatic tamper. Some difficulty was encountered with failure of certain linings, notably linings 1A, 4A, 5A, and 8A. (See accompanying table.) (The four channels are numbered A, B, C, D from north to south, and the eight parts of each channel are numbered 1, 2, 3, . . . 8, from the inlet end to the outlet end.)

These failures took the form of washouts that occurred immediately after the water was first turned into the channel. The focal point of these washouts appeared to be shrinkage cracks which had developed during the interval between the time of construction and the time the water was placed in the channel. The outlets were capped for 24 hours in order to avoid similar failures, and to permit testing of the linings without the necessity of making major repairs, or replacing the linings with provision for maintaining the moisture through the construction period to eliminate cracking. This gave the linings an opportunity to swell, closing the cracks, or in the case of lining 1A, to settle.

It is significant that the linings consisting of bentonite mixtures did not develop shrinkage cracks during this initial period. Some small shrinkage cracks, however, did develop upon partial drying following a period of use. Lining 3A has failed periodically since its installation, and has been removed and replaced with a new lining of the same composition. Two parts of bentonite in 100 parts of Trenton sandy loam appear to be too little to stabilize the sandy loam. Also, the permeability for this lining, as presented in the table, is rather high. All linings, except 6A, have eroded to some extent at the water line from wave action. This erosion is in the form of undercutting characteristic of all earth canals and responsible for the shape which earth canals take, regardless of the original cross-section.

The specific weight of the linings in channel A is somewhat less than the specific weight of these materials when compacted at optimum moisture, as determined by Proctor's method.

The permeability of the various linings varied widely, as might be expected. It is notable, however, that the permeability of linings initially high tends to remain high or increase, and those linings initially low remain low or decrease. The uncompacted Oasis silt loam and oil treatments are the exception.

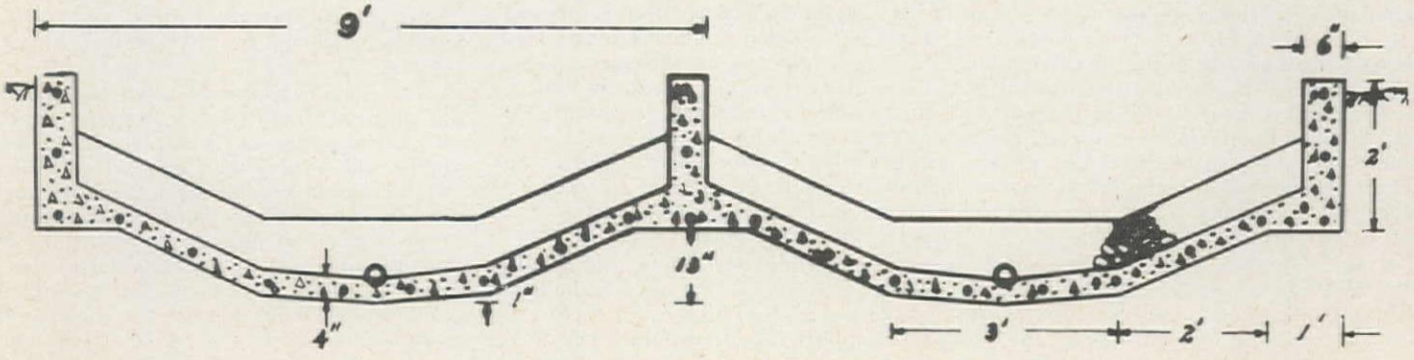
The Oasis soil, like some bentonites, appears to be one of those materials in which the permeability gradually decreases for the uncompacted material until the equilibrium value is of the same order as that for material initially compacted. This Oasis soil was used for lining a 4,000-ft. section of the Delta Melville C-Canal in March, 1941. The average permeability of the compacted soil at 5 stations immediately after lining, as reported by Israelsen and Reeve, was 0.12 ft. per year. Subsequent measurements in 1944 resulted in an identical value for the permeability with that determined immediately following lining, indicating no measurable change in the permeability in 3½ years.

While the particle size distribution of the material in the Oasis (1A), and Mendon (5A) soils is different, it is sufficiently similar to place them in the same textural classification, silt loam. The permeability, however, as seen from the table, is very different. The Trenton soil is very sandy and highly permeable. The addition of bentonite, at the rate of 5 to 10 parts per 100, reduced the permeability sufficiently to place these mixtures in the class of materials well suited to the lining of canals. The mixture containing 10 parts of bentonite, (7A) in fact, had the lowest permeability of any of the linings tested.

It is known that the presence of salts, and differences in the exchange ion on the clay complex, greatly influence the permeability of earth materials. The salt content of the percolate is being measured as an index to the changing permeability of the linings and disintegration which may occur while in use.

Since the time of freezing weather, it has been observed that there was a tendency for the linings to break up at the water line. Inspection on Dec. 19, 1946, revealed a marked increase in the flow of percolate from 2A and it was found that the water was coming from a small hole which had developed in the lining near the water line. The ice on the channel at this time was strong

CROSS SECTION of two of the experimental canals showing the trapezoidal concrete seepage intercepting basin, in the center of which is a 2-in. perforated pipe. An 8-in. mat of washed and graded gravel rests on the concrete, in diagram below.



COMPOSITION AND PERMEABILITY OF EXPERIMENTAL LININGS

Lining No.	Material	Specific weight Cores from lining lb. per cu. ft.	Specific weight Proctor cylinders lb. per cu. ft.	Thickness of lining feet	Permeability Date sample collected 8-30-46 ft. per year	10-15-46 ft. per year	11-26-46 ft. per year	12-14-46 ft. per year
1A	Oasis silt loam—uncompacted*	.....	.....	.19	.70	.08	.10	.07
2A	Trenton sandy loam 100 parts Bentonite 5 parts	101	111	.33	.26	.27	.22	.28
3A	Trenton sandy loam 100 parts Bentonite 2 parts	101	112	.36	69.83	†1.41	†1.52	†2.03
4A	Mendon silt loam—salted..... 1 lb. per 5 sq. ft.	91	97	.31	76.24	566.89	158.44	392.33
5A	Mendon silt loam.....	92	97	.29	14.47	15.40	40.77	5.43
6A	Trenton sandy loam— oil treated	103	108	.34	33.72	10.75	6.20	5.71
7A	Trenton sandy loam 100 parts Bentonite 10 parts	106	112	.30	.06	‡0.00	.09	.74
8A	Oasis silt loam.....	104	107	.19	.24	.12	.08	.21

*All linings except 1A were compacted at optimum moisture by means of a pneumatic tamper.
† Replacement lining. ‡ Insufficient flow to collect sample.

enough to hold a man's weight. In view of these conditions, the water was turned out for the winter. In the spring, after careful inspection and necessary repairs, the tests in channel A and B will be continued.

The small scale of the tests and the special conditions imposed by the experimental facilities, precludes the possibility of obtaining cost data which can be applied to field installations. The best source of data on the relative cost of various linings is believed to be the construction records of the Bureau of Reclamation. Factors which determine the justifiable cost of lining irrigation canals are discussed in some detail by Israelsen and Reeve, "Canal Lining Experiments in the Delta area of Utah;" Utah Agricultural Experiment Station Bulletin 313.

Tentative conclusions

The investigation has not been in progress long enough to justify drawing general conclusions or making recommendations concerning materials or construction methods which should be employed in lining canals. The data, however, suggest that:

1. The effectiveness of clay linings may deteriorate rapidly if they are subject to intermittent drying.
2. Sandy loam bentonite mixtures seem to be preferable to clay for exposed canal linings because they are less subject to cracking upon drying.
3. All earth linings should be protected by a layer of gravel, loose rock or other material to prevent erosion and eventual destruction of the lining. The side slopes are most subject to erosion, particularly above the low water level.
4. A layer of the natural earth material over the lining on the side slopes above the low water level, will do much to prevent the deterioration of earth linings through wetting and drying and frost action.
5. Compaction at optimum moisture does not reduce the permeability of sandy loam bentonite mixtures or the equilibrium permeability of certain soils over that of moderate packing in the air dry state.
6. In view of the above, materials for lining should be restricted to those materials which assume a low equilibrium permeability, irrespective of compaction, as insurance against increased permeability with use, a condition which might be expected to develop where the low permeability of a material is dependent primarily on its initial state of compaction.

Low Bid Wins Colorado Pumping Plant Contract

CONSTRUCTION of the Granby Pumping Plant on the Bureau of Reclamation's Colorado - Big Thompson project in Colorado has been placed under a contract amounting to $4,139,998, according to a Bureau announcement. The contract was awarded to the Granby Constructors, Colorado Springs, Colo., the low bidders.

The pumping plant will be built between Granby and Grand Lake, Colo., southwest of U. S. Highway 34. It will pump the water that will be transported from the western slope of the Rocky Mountains to the eastern slope through the 13-mi. Alva B. Adams tunnel under the Continental Divide. More than 600,000 ac. of land on the eastern slope will be benefited and insured against crop failures in dry seasons. The plant is scheduled to begin operations in Nov., 1949.

Meanwhile, water users on the eastern slope of the Rockies have pledged $115,000 to construct a 38-in. temporary pipeline from the eastern portal of the Adams tunnel to the Big Thompson River to permit diversion of 125 million gallons of water daily so as to get irrigation water without waiting for the completion of the project distribution works.

Major items of construction under the contract include about 973,000 cu. yd. of excavation, more than 468,000 cu. yd. of fill and backfill, placing of about 18,500 cu. yd. of concrete, and installation of 734 tons of cranes, runways, gates and other metalwork.

The Granby Constructors is a joint venture composed of six firms from three states: Condon-Cunningham Co., Wunderlich Contracting Co., Peter Kiewit Sons' Co., and Grafe-Callahan Construction Co., all of Nebraska; Brown and Root, Inc., Tex., and Ed. H. Honnen Construction Co. of Colorado.

The plant must be completed in 23 months.

Nevada Irrigation Ditches Stay Unfenced, Court Rules

AN 81-YEAR OLD Nevada public safety law does not apply to irrigation ditches, it was held by the Nevada Supreme Court, reversing the decision of the Reno justice court which decided that a portion of the Orr ditch in the city of Reno must be fenced.

The suit, started in the Reno justice court by Harlan Heward, Reno attorney, acting as an individual, charged the Orr Ditch & Water Co. with violation of an 1866 statute which requires safeguarding of open excavations, shafts or other dangerous workings. The case was taken to the Supreme Court by the ditch company, which obtained an alternative writ of prohibition to stop the court action. The Supreme Court decision makes the writ permanent.

The supreme court's decision, written by Justice Charles Lee Horsey, with Chief Justice Edgar Eather concurring, found that cases brought under the 1866 law all applied to open mine shafts, wells or other excavations, but not to irrigation ditches. It stated that an enormous expenditure would be necessary if all irrigation ditches in the state were fenced in.

New Publication Sponsors Dimensional Coordination

DEVOTED to the advancement of dimensional coordination, a new publication was launched recently entitled Grid Lines, and sponsored by the Modular Service Association. This publication, dedicated to the advancement of American Standards Association Project A62, for the coordination of building product sizes, and making public the benefits to be gained from it by the consuming public in the form of lower building costs, is endeavoring to provide wider dissemination of the research results.

Modular coordination in building is an accomplished fact, and its use has been constantly expanding. In eight years the committees of the American Standards Association Project A62 have done considerable work toward resolving the dimensional difficulties prevalent among architects. The basis for dimensional coordination, the continuous three-dimensional grid, spaced on the 4-in. module, has been developed and proved in practice. The new publication was established to promote its use on a wider scale.

Runoff Forecasts—
1947 Water Supply in Western States

SNOW SURVEYING is now carried out by many agencies using modern over-snow machines instead of the laborious hiking on snow shoes or skis. The machines make possible more extensive surveys in remote watersheds than was possible in early years.

Cooperative snow surveys in the Western States indicate a progressive worsening of water supply from the north to the southern portion — Montana runoff will approximate 140 per cent of normal, while Southern California and Arizona may anticipate 40 per cent or less

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ANALYSES OF SNOW samples collected in April throughout the West indicate 1947 water supplies generally similar to the run-off actually experienced in 1946, although perhaps not so favorable. The water shortage in the Southwest will be unrelieved and threatens to be even more extensive than last year. As in 1946, however, the prospects show improvement progressively from south to north, and while Nevada, southern Oregon and southern Idaho will experience shortages—some of them severe—the Northwest generally will have ample water for both irrigation and hydro-electric power. A comfortable situation is also faced by the areas east of Continental Divide, but widespread shortages will characterize Rio Grande basin. Only in parts of the Northwest do possibilities of floods appear, and such threats as are faced by that section are not alarming.

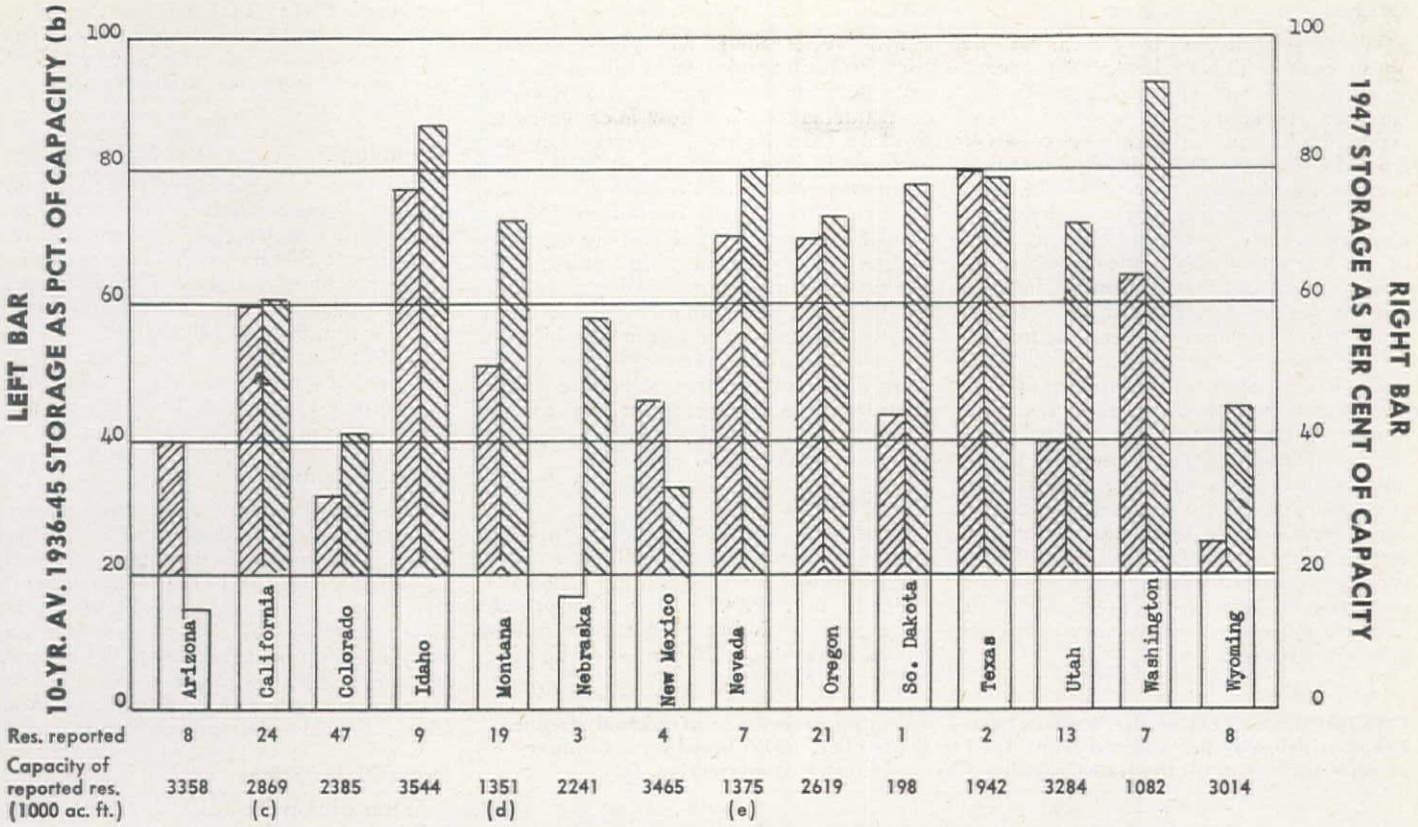
In the following paragraphs the water supply prospects are summarized state by state, in arrangement comparable to that followed by *Western Construction News* in its May 1946 and May 1945 issues. These forecasts are based on the snow surveys conducted by the Division of Irrigation and Water Conservation, U. S. Soil Conservation Service, and its many cooperators, including the various states, Forest Service, Geological Survey, Bureau of Reclamation, power companies, irrigation districts, and many others. The two charts further summarize results of the April surveys.

Arizona

An acute shortage of water is imminent throughout the major irrigated areas. The winter snow-water crop was very short, record lows being recorded for most snow-survey courses. This shortage, coupled with general below-normal precipitation, will produce abnormally low run-off during the irrigation season. Reservoir storage is near an all-time low for April 1, being only 15 per cent of total capacity. (The 1936-45 average was 40 per cent of capacity.) Storage in Lake Mead (behind Boulder Dam) has declined to 59 per cent of capacity from the 1936-45 average of 72 per cent.

California

A general shortage is in prospect, the full natural April 1-July 31 stream flow of snow-fed mountain streams being forecast by the California Cooperative Snow surveys, in proportions of the 1936-45 means, from 28 per cent for Kern River at Bakersfield to 68 per cent for Sacramento River at Shasta Dam. Other principal Sierra streams show the following prospective run-offs: Kaweah River at Three Rivers, 41 per cent; Kings at Piedra, 50; San Joaquin at Friant, 54; Merced at Exchequer, 51; Tuolumne at La Grange, 55; Stanislaus at Melones Dam, 60; Mokelumne at Mokelumne Hill, 61; American at Fairoaks, 51; Yuba at Smartsville, 54; Feather at Oroville, 53. The over-all picture may thus be said to promise about a 50 per cent year. However, 24 reservoirs having a total capacity of 2,869,000 ac. ft. of water, are holding 1,742,000 ac. ft., or 61 per cent of capacity. The average storage in the 1936-45 period was slightly less than this amount, or 60 per cent of total capacity. Three major reservoirs not included in the 24 have been put in operation in 1943. They are: Narrows, capacity 45,000 ac. ft.; Friant, 436,500, and Shasta, 3,714,000. On April 1 the total storage in the 27 reservoirs including these three was 71 per cent of total capacity.



	Arizona	California	Colorado	Idaho	Montana	Nebraska	New Mexico	Nevada	Oregon	So. Dakota	Texas	Utah	Washington	Wyoming
Res. reported	8	24	47	9	19	3	4	7	21	1	2	13	7	8
Capacity of reported res. (1000 ac. ft.)	3358	2869 (c)	2385	3544	1351 (d)	2241	3465	1375 (e)	2619	198	1942	3284	1082	3014

RESERVOIR STORAGE AS OF APRIL 1, 1947

Not all reservoirs in all States are reported, but enough are reported to give a reliable index of each State's storage supply. Explanation: (b) Most State averages for reported reservoirs are for full ten-year period, but in a few cases reservoirs having shorter records are included. (c) Does not include Narrows (Yuba River), Friant or Shasta reservoirs. April 1 storage in these three reservoirs combined is 3,287,000 ac. ft., which is 78% of their capacity. (d) Does not include Fort Peck reservoir (capacity 19,000,000 ac. ft.); Apr. 1 storage 14,980,000 ac. ft. (e) Does not include Lake Mead (capacity 31,140,000 ac. ft.); Apr. 1 storage approximates 18,372,000 ac. ft.

Colorado

Prospects vary widely, streams east of the Continental Divide promising run-off generally in excess of the 1936-45 average, while Rio Grande Basin streams will be in generally low supply (from 65 to 90 per cent of average). Southern Colorado Basin streams will flow substantially below normal but those in the northern part of the basin will exceed the average. Forty-seven reservoirs have filled to 41 per cent of total capacity, as compared with an average April 1 filling of 32 per cent.

Idaho

The snow pack is progressively lighter from north to south, so that run-off substantially in excess of the 10-year average is in prospect for northern streams but some southern areas will have subnormal supplies. Kootenai and Clark Fork will experience heavy run-off, with some likelihood of floods. Mid-Idaho stream discharges will be about normal, with no severe floods in prospect and a water supply generally adequate for irrigation. In extreme southern and western areas the outlook is for irrigation shortages ranging from slight to severe, depending on weather conditions during the planting and growing seasons. Water stored in nine major reservoirs, including Jackson Lake, is 87 per cent of capacity as compared with the 10-year average of 77 per cent.

Montana

Run-off prospects are 15 to 20 per cent better than a year ago, with reservoir storage also higher. Precipitation is above average, recent heavy storms having reversed the previously-developing dry trend. Stream flow is about normal for mountain streams, while severe floods have occurred in the eastern part of the state. Soil moisture conditions are good. Seventeen reservoirs west of Continental Divide are 39 per cent full, or slightly better than on April 1, 1946; 23 in Missouri drainage are at 74 per cent of capacity (64 per cent last year), and Fort Peck reservoir is 79 per cent full (68 per cent a year ago).

SNOW samples, similar to those shown below, are weighed immediately, to ascertain the water content of each.

Nevada

The summer run-off available for irrigation will be short, with the general average ranging from 40 to 50 per cent of the 1936-45 average. Soil moisture and ground-water conditions are fair, but the snow-water storage on the mountains is poor. Reservoir storage is very good, and total storage may reach 90 to 95 per cent of reservoir capacity, thus helping to alleviate the shortage of natural stream flow.

New Mexico

Rio Grande drainage promises run-off substantially below the 1936-45 average, only Taos River showing a discharge in excess (125 per cent) of normal. Other forecasts for the basin, in per cent of normal, are: Chama, 65; Embudo, 52. The main river, at Otowi Bridge, will flow 76 per cent of normal. Discharge of Pecos River will be less than half (48 per cent) of the 10-year average, and that of Canadian River, while better than Pecos, will be only 75 per cent of the average. Four major reservoirs are 33 per cent full, as compared with a normal of 46 per cent.

Oregon

Water supplies in many areas will be about comparable to 1944; 72 per cent of irrigated lands will have good-to-fair supplies; these are served chiefly from reservoirs holding substantial carry-over from 1946. Most lands dependent upon unregulated stream flow will have supplies ranging from fair to deficient. Mountain snow cover is below average on 91 per cent of all measured snow courses, and if precipitation during the run-off season is normal or less, stream flow below normal is certain for all streams except Hood River and Wallowa River. However, watershed soils are wetter than average, thus favoring flow from the deficient snow pack. Crop land soil moisture is generally good, with fallow lands showing better than average. About three-fourths (73 per cent) of the more important reservoirs are half-full or better; the general picture as regards storage is slightly better than the 10-year average—73 per cent of total capacity as compared with 70 per cent average.

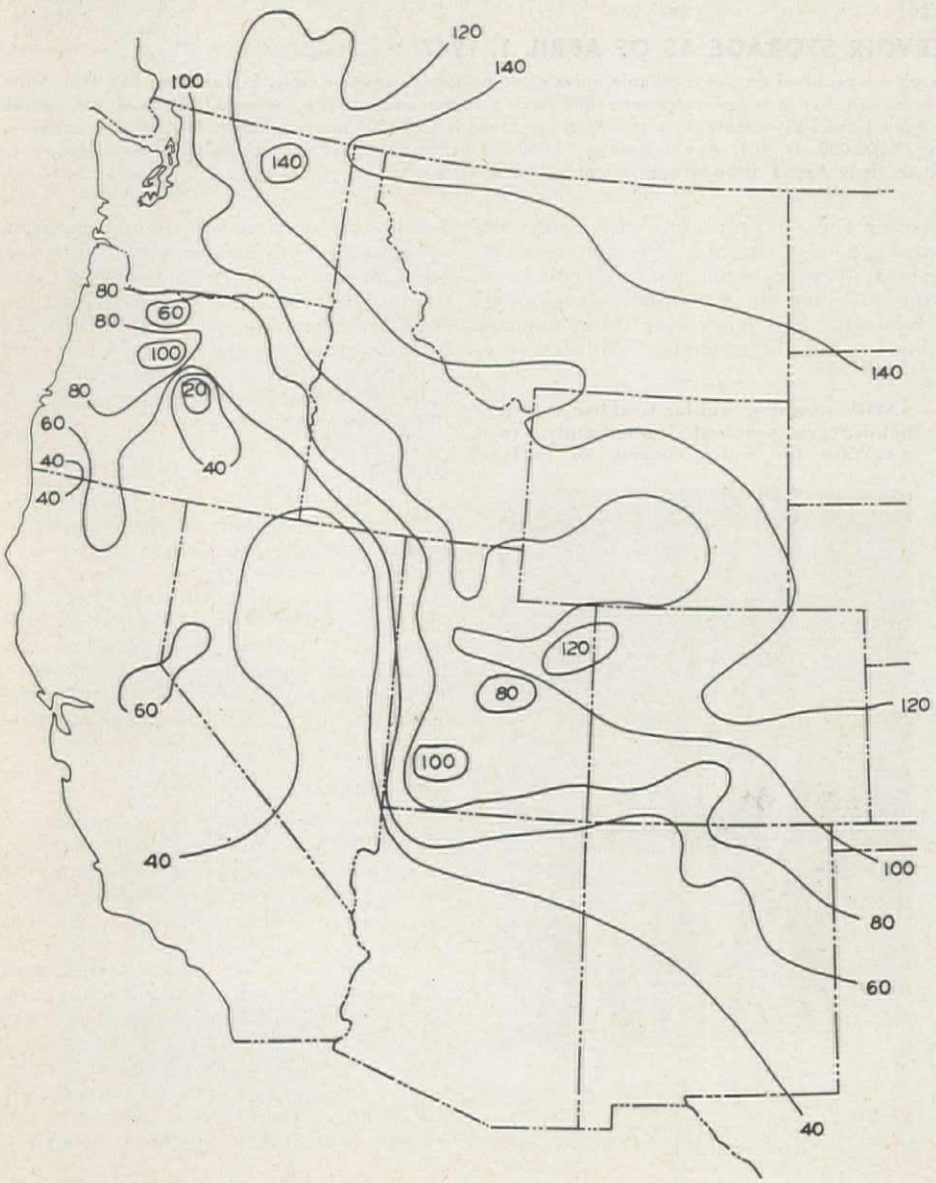
Utah

Most watersheds will yield satisfactory irrigation supplies. While total run-off, including flood waters, may be lower than normal, stream flow is expected to hold up through the late irrigation season. April-September run-off will range from 70 per cent of the 1936-45 average for Price River (near Heiner) to 132 per cent for Strawberry River (near Duchesne). Storage is at a high point, with the principal reservoirs showing storage totaling 72.4 per cent of capacity. Utah Lake and Bear Lake are at the highest levels in many years. Storage users should, therefore, have adequate water with the possible exception of those on Price River, as the holdover in Scofield reservoir is very low.

Washington

Prospects are for supplies ranging generally from somewhat above to only slightly below normal. Storage generally exceeds the 1936-45 average, five principal reservoirs being 94 per cent full as compared with the 10-year average of 65 per cent. Plenty of water in the main stem of Columbia River appears assured for generation of electric power; high river stages and some flood damage may, in fact, occur.

CONTOUR SKETCH of the Western States indicating percentage of normal stream runoff which may be expected from April to September, 1947, based on a summary of snow surveys in all the states, tabulated by Soil Conservation Service.



Wyoming

Prospects as regards both run-off and storage average better than normal. Run-off of five principal streams will be as follows: Shoshone, below reservoir, 133 per cent of the 1936-1945 average; Big Horn, at Riverton, 115; Popo Agie, at Riverton, 97; North Platte, at Saratoga, 97; Laramie, at Jelm, 123. Eight principal reservoirs are 45 per cent full, as compared with the 10-year average of 25 per cent.

British Columbia

Above-normal run-off is expected for all streams in the Kootenai-Columbia Basin, including Okanogan. North Thompson River at Barriere and Powell River on the coast should also flow above normal. Indications are that an early breakup is ahead, the flow of some streams being above normal. At all snow courses the ground is moist and not frozen beneath the snow cover.

Great Plains States

Storage in one South Dakota reservoir is 78 per cent of capacity, as compared with an average of 44 per cent. Three Nebraska reservoirs are 58 per cent full; average 17 per cent. One Oklahoma reservoir is 32 per cent full. Two Texas reservoirs are 79 per cent full; average 80 per cent.

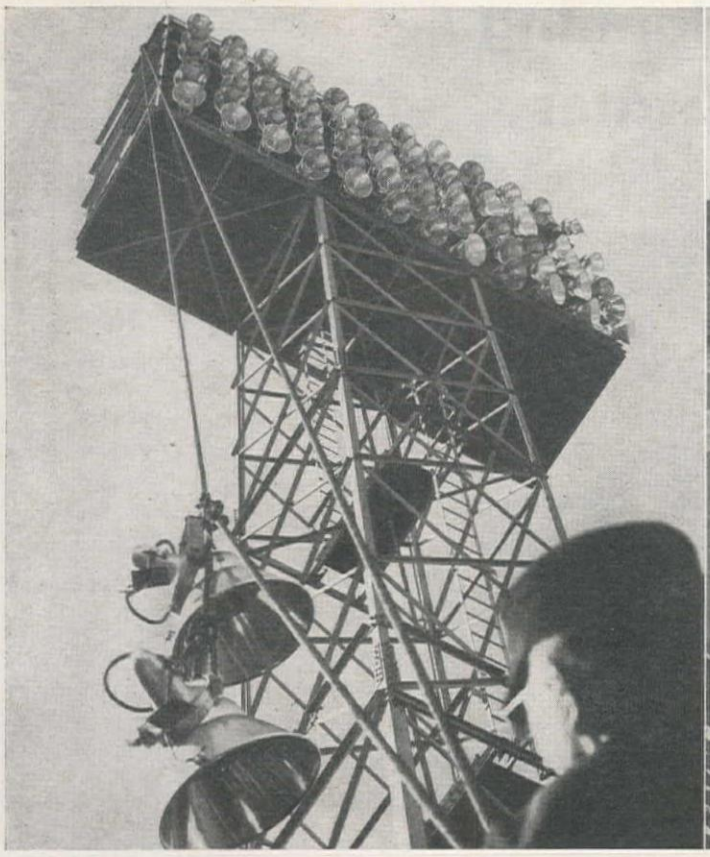
Detailed forecasts available

Reports detailing the results upon which the foregoing summaries are based may be obtained by addressing the Division of Irrigation and Water Conservation, Soil Conservation Service, College Hill, Box D, Logan, Utah. Requests should identify the state or drainage basin about which information is desired.

Washington Asks Federal Aid For Engineering Surveys

FAILURE OF THE STATE legislature to appropriate $750,000 for additional engineering surveys for the proposed 2.03-mi. Cascade Mountain vehicular tunnel in Washington has led Gov. Mon Wallgren to say that he will seek federal assistance for construction of the toll tunnel. "I am going to try to take the Cascade tunnel project up with the federal government on the basis of a national defense project," Wallgren is reported as saying at Olympia, after the legislature had adjourned without taking action on the bill which would have appropriated funds for final location and design of the tunnel.

POWER REVENUE from the Second Nisqually project of the Tacoma Department of Utilities has already paid a quarter of the construction cost of $22,686,238.



New System Lights Seals Stadium

ENOUGH LIGHT to illuminate a highway 100 mi. long has been provided the Seal's Stadium, San Francisco, home of San Francisco baseball club of the Pacific Coast League, with the installation of a complete set of new narrow beam sports floodlights, according to announcement made by A. G. Jones, San Francisco manager of the apparatus department of the General Electric Co. Installation of the General Electric L-69 floodlight, first used in Yankee Stadium last year, and later improved, was completed shortly before the Seals played their first night game for 1947 with the New York Giants on March 28.

Sighting for the new and revamped lighting system was done in broad daylight. Targets were placed over the complete playing field. These markers were located in the center of 20-ft. squares, each area being designated by a letter and a numeral, similar to a map and chart which shows into which area each light is to be aimed. All lights were individually aimed, by means of rifle-like sights, to a pre-determined area on the field, giving a smooth, evenly distributed lighting effect. A night check-up later indicates any minor changes required to smooth up the job.

308 lights altogether

A special reflector is contained on the new floodlight which narrows the spread of the beam to less than 20 deg. and thus provides greater lighting efficiency. Of the total lighting system of 308 floodlights in Seals Stadium, 208 were replaced with the new narrow beam lights, with the balance consisting of the regular medium and wide beam units such as used on Yankee Stadium.

Lowest row of lights is 125 ft. above the playing field. Two of the 6 lattice steel towers on which the lights are mounted are behind home plate, and contain 32 narrow beam floodlights each. One tower is in the first base area, with 72 narrow beam floodlights; one is in the third base area, with 72 narrow beam floodlights; and one each is located in right and left center field. These outfield towers each hold 30 medium and 20 narrow beam floodlights. All towers on the spectators' side of the field are behind the seats, so there is nothing to obstruct the view of the field.

Original lighting was put in the Seals Stadium in 1931, which made the baseball park one of the pioneer lighting installations as well as one of the best, at the time.

Each L-69 unit among the 308 lights comprising the new system will use a 1500 watt globe burned at 10 percent overvoltage to increase illumination of each globe by more than 30 percent. The entire system will consume 539,400 watts.

The narrow beam type of lighting is particularly useful in stadiums in which there is a long distance between floodlight and playing area, according to Don T. Carter, San Francisco, General Electric sports lighting expert. The new lights are believed to increase visibility and spectator enjoyment by approximately 100 percent.

Baseball-proof glass

The same type of glass as that of the glass "baseball-proof" backstop purchased by the Seals recently comprises the windows of the new floodlights. It was the virtually unbreakable glass windows in the floodlights that gave the Seals management the idea for the backstop. In tests conducted thus far, a continuous rain of baseballs and hammering with bats has been unable to break this type of glass backstop, which will replace the usual chicken wire fence behind home plate.

Engineered for sports lighting application, the L-69 floodlight uses a general service lamp, which is less expensive and more rugged than the special floodlight service lamps. The floodlight is so constructed that it can be serviced from the back, without ever having to disturb its aiming adjustment. As the glass window is permanently installed as an integral part of the floodlight, and the servicing opening is constructed with an asbestos gasket and in such a manner that rain cannot enter, it is practically impossible for dirt, dust, bugs, moisture or any foreign matter to get into the floodlight and reduce its efficiency.

FWA, REA Approve Planning Advances to Western States

FURTHER ADVANCES to western states to finance the preparation of drawings and specifications for local public works were announced recently by the Federal Works Agency. Funds for planning are to be repaid, without interest, when construction begins. Following is a list of latest advances.

Arizona

Casa Grande was granted two advances by the FWA: one for sanitary sewer system additions in Evergreen Addition, estimated cost of which was $30,010, and Federal advance of which was $1,400; the other advance was for $650 for sanitary sewer system additions, including comfort station, estimated at $13,865.

Navajo County was advanced $3,500 for additions to the jail at Holbrook, estimated at $91,815, while Tucson received a Federal advance of $19,500 for an estimated $450,000 additions and alterations to the city hall.

Montana

Browning received an advance of $4,450 for street improvements, consisting of curbs, gutters and sidewalks, estimated at $174,388.

Great Falls received two planning advances for street improvements. The first was for $10,000 for preparation of drawings and specifications to repave business area streets at an estimated cost of $268,000. A second advance of $4,450 was for plan preparation for paving Second St. at an estimated cost of $119,720.

New Mexico

Bayard was advanced $7,800 to finance plans and preparations for street grading and paving, including curbs and gutters at an estimated cost of $286,730. Jal was granted $1,650 for plans and specifications for a projected $55,000 swimming pool and bath house.

North Dakota

Bismarck, Burleigh County, received a Federal advance of $3,050 for preparation of plans and specifications for veterans' addition street improvement, including surfacing and drainage facilities, estimated cost of which is $82,012.

Oklahoma

Ardmore received a total of four advances, all for storm sewer mains. These included: southeast area, a Federal loan of $1,800 for a proposed $79,000 project; northwest area, $4,950 for a project estimated at $172,000; northeast area, advances of $3,450 for an estimated $150,000 project; southwest area, $950 advanced for a $41,000 improvement. School District No. 158, Tillman County was granted $4,000 for preparation of plans for a grade school at Frederick at an estimated cost of $120,000.

Oregon

The Lincoln County School District was advanced $12,700 for preparation of drawings and specifications for a new grade school at Waldport, to cost an estimated $344,000. The project is to include a combined auditorium-gymnasium.

Orient School District, 6 Joint and 300 Joint, Multnomah and Clackamas Counties were granted a Federal advance of $2,700 for preparations of plans and specifications for addition of classrooms to a grade school at Orient, estimated at $60,000.

Texas

El Paso was advanced $137,400 to finance preparation of drawings and specifications for the elimination of eight grade crossings in the downtown area and the construction of an overpass on Cotton Avenue. The estimated cost is $4,714,500. Elimination of the downtown grade crossings would be accomplished by depressing the Southern Pacific railroad tracks. The city also received a grant of $8,500 for storm sewers to protect the grade separation project, estimated at $280,500.

The Needville Rural High School District was also granted an advance of $9,900 for a senior high school at Needville, estimated to cost $287,000.

Washington

The Greenwood Avenue Sewer District in King County, adjacent to Seattle was advanced $6,500 to finance preparation of drawings and specifications for a sanitary sewerage system and treatment plant at an estimated cost of $1,223,000. The proposed project calls for the construction of about 36½ miles of sanitary sewers, a primary treatment plant and an outfall line to deep water in Puget Sound.

Ridgefield was granted $2,500 for plans for a sanitary sewerage system and treatment plant, estimated to cost $86,900.

Wyoming

The Board of County Commissioners of Johnson County were granted a Federal loan of $3,200 for plans for a county general hospital at Buffalo, estimated cost of which is $126,050.

REA Loans

MANY ADDITIONAL loans to rural electric cooperatives in the western states have been announced by the Rural Electrification Administration in releases received during the past few weeks. The funds from these loans will be used to finance rural electric facilities, construction of which will proceed as rapidly as materials become available. Following appears a list of most recent advances.

Arizona

The Ma-Yu Electric Cooperative, Inc., Buckeye, received a loan of $15,000 for lending to members to finance farmstead wiring and plumbing.

California

Surprise Valley Electric Corporation, Alturas, received $465,000 to build 230 miles of line to serve 362 rural consumers, of which 38 mi. of line serving 54 consumers will be constructed in Lake County, Oregon. The remainder of the construction will be in Modoc and Lassen counties, Calif.

Colorado

Intermountain Rural Electric Association, Littleton, was loaned REA funds totaling $120,000 for 79 mi. of line to serve 83 rural consumers. The Mountain View Electric Association, Inc., Limon, received $600,000 for system improvements and for 425 mi. of line to serve 429 rural consumers.

Montana

The Ravalli County Electric Cooperative, Inc., Corvallis, was advanced $73,000 for system improvements and for 36 mi. of line to serve 64 rural consumers.

Nebraska

Southern Nebraska Rural Public District of Grand Island, received REA funds amounting to $385,000 for 236 mi. of line to serve 601 rural consumers. Included in this loan are funds to finance the acquisition of 37 mi. of line serving 253 consumers in Adams County and to construct lines to serve 130 rural consumers who, without this acquisition, could not have been served.

New Mexico

Central New Mexico Electric Cooperative, Inc., at Corona, a new borrower, received funds of $707,500 for purchase and installation of a 900 kilowatt generating plant and for 401 mi. of lines to serve 543 rural consumers. The Roosevelt County Electric Cooperative, Inc., Portales, was granted $40,000 for lending to members to finance farmstead wiring, plumbing, and purchase and installation of electrical appliances and of irrigation pumps.

Oregon

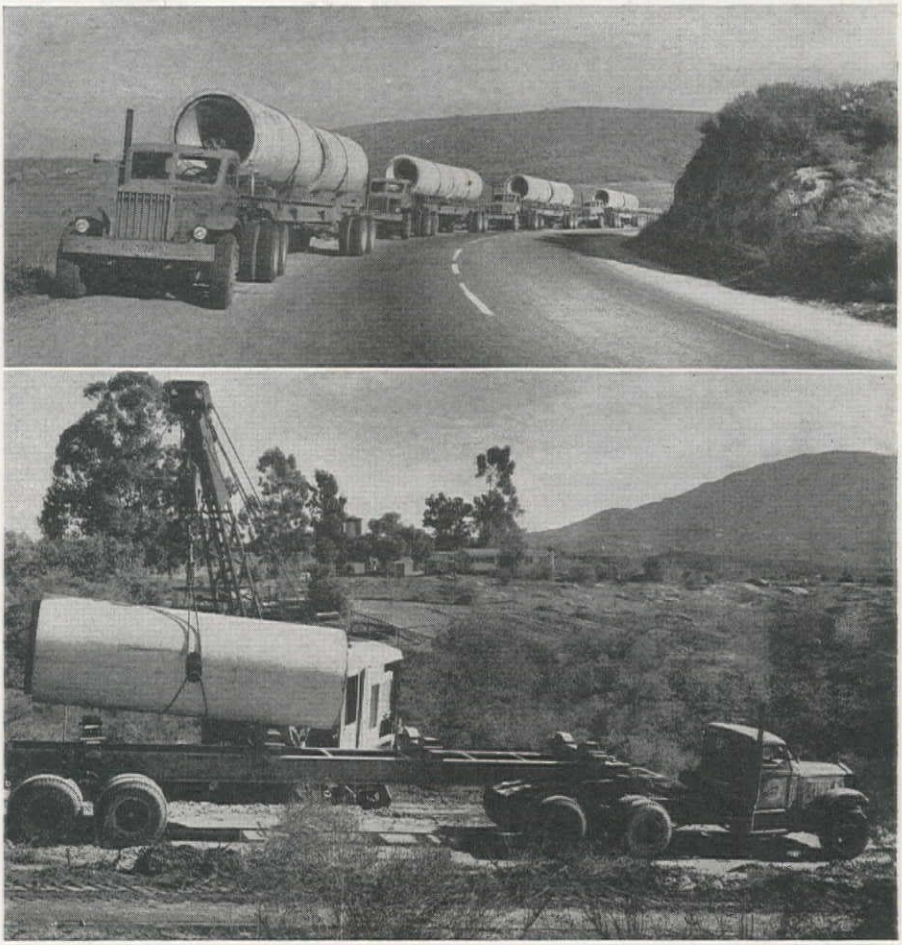
The Blachly-Lane County Cooperative Association, Blachly, received $215,000 for system improvements, for completion of previously approved construction and for 50 mi. of line to serve 118 rural consumers. The Central Electric Cooperative, Inc. at Redmond, was given $75,000 for 27 mi. of line to serve 208 rural consumers.

Texas

Johnson County Electric Cooperative Association, Cleburne, received $150,000 for previously authorized construction for system improvements and for 71 mi. of lines to serve 219 rural consumers. Fannin County Electric Cooperative at Bonham was given $425,000 for system improvements and for 294 mi. of lines to serve 930 rural consumers.

Heavy Pipe Moved on Special Trailer

Concrete pipe for San Diego aqueduct job moved on specially-built Fruehauf trailers—Two lengths of pipe carried on extra-long combination vehicles without violation of California Vehicle Code



CARAVAN of the specially-constructed trailers carrying pre-cast concrete pipe to the San Diego Aqueduct. The two lengths of pipe on each truck weigh up to 46,000 lb. Below, a section of pipe being lifted onto the 18-wheel, 35-ft. semitrailer.

ONE SECTION, nearly 40 mi. long, of the aqueduct being constructed by the Navy to bring Colorado River water to drought-threatened San Diego, Calif., (see *Western Construction News* for Feb., 1946 and April, 1946) was contracted to the United Concrete Pipe Corp. of Los Angeles. The contractor processes, transports and lays precast reinforced concrete pipe in 16-ft. lengths on that section of the aqueduct. The pipe is cast in its yard at Baldwin Park. Diameter of the pipe over the principal section is of 54 and 72 in. The method of hauling the pipe was a highly important factor in several ways, cost in particular, as the contract was awarded on a bid basis. If transportation costs were excessive, they might defeat the company's chance for the contract.

The tractor-trailer method of hauling had to be employed as no other facilities were available and single tracks were impractical.

Each 16-ft. length of pipe was of uniform weight, according to diameter. The range was from 11 to 11½ tons. The haul from plant to site was long. One length per load would make the cost prohibitive. Two lengths, weighing 22-23 tons, would exceed allowable legal highway weight limits if placed on a semitrailer of ordinary type.

The customary tractor-semitrailer combination is permitted a gross weight of 68,000 lb. in California. A two-length load of pipe, weighing up to 46,000 lb. could not be hauled, because the additional tare weight of tractor and trailer exceeded the allowable gross.

Special trailer design

Confronted by this dilemma, United Concrete Pipe Corp. conferred with engineers of the Fruehauf Trailer Co., manufacturers of Los Angeles. The problem was to design and build a vehicle that could safely carry two lengths of pipe in conjunction with the company's tractors and still comply with the California Vehicle Code. It was necessary to comply with the code and this involved axle spacing, axle weights and vehicle length limits in addition to gross weight. The entire solution devolved upon the trailer setup as the power unit could not be altered.

The result of considerable engineering study was that the tractors with 215-in. wheel base were combined with a "jeep" providing 66-in. wheelbase between its axle and the tractor's driving axle and a 35-ft. semitrailer with the underconstruction set at the extreme rear, so that in respect to tare weight a 23-ton payload could be realized.

The equipment is extremely long, having an overall wheelbase of 607 in., permitting a gross allowable loading of 72,800 lb. Axle weight limitations, however, limit the gross to 72,500 lb.

The equipment itself was stripped to do the job by eliminating all weight producing components not essential to the operation. Special frames to support the concentrated loads were designed to provide adequate strength over the long span involved without adding excessive weight.

No sooner did the new type combination vehicles appear on the highways than the State highway patrol swooped down. The officers claimed it was impossible to construct trailers that could carry such loads and meet every requirement of the vehicle code. Drivers were escorted to scales and the units weighed wheel by wheel, axle by axle, and all combinations of axles, and they were measured for axle spacing and overall length. According to drivers' reports, the patrolmen seemed reluctant to admit that everything was in accord with the law, but after repeated attempts to find a loophole they eventually suspended such activities.

Construction of the aqueduct is now about 80 per cent completed. It is anticipated that water will flow through it this coming summer.

Sacramento Approves Deep-Water Channel Construction

AT AN ELECTION on April 15, voters of Sacramento and Yolo counties of California voted by a 4-to-1 majority to create a special district to be known as the Sacramento-Yolo Park District, the principal duty of which will be to expedite construction of a deep-water channel from San Francisco Bay to Sacramento, permitting ocean-going vessels to make that city a port of call.

The Corps of Engineers has perfected a plan to accomplish this result, through construction of 44 mi. of channel and a turning basin in Lake Washington, an existing body of water near Sacramento. The plan was outlined in the July, 1945 issue of *Western Construction News*.

At the same election, the voters approved expenditure of $3,100,000 as their share of the cost of the project.

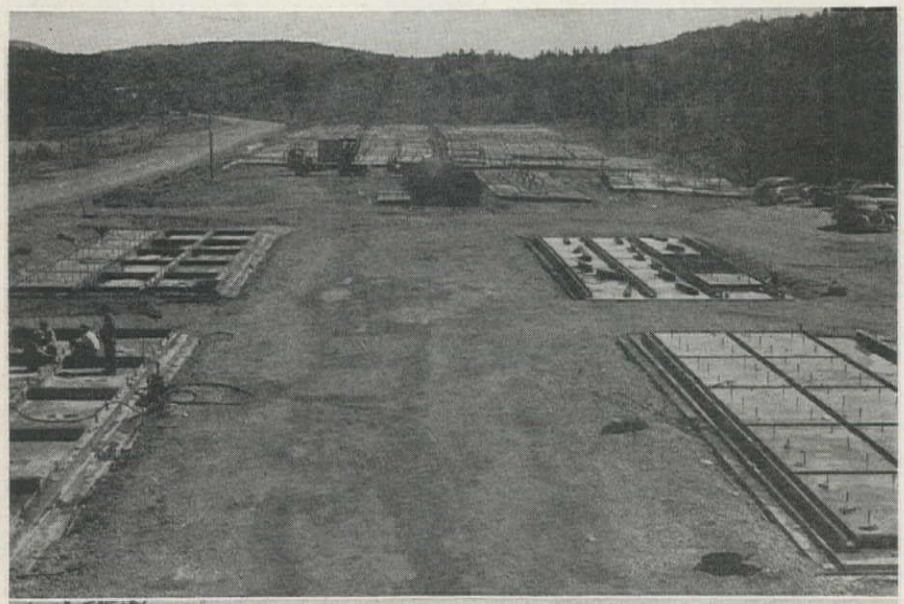
Disintegrating Upstream Preserved With Blanket

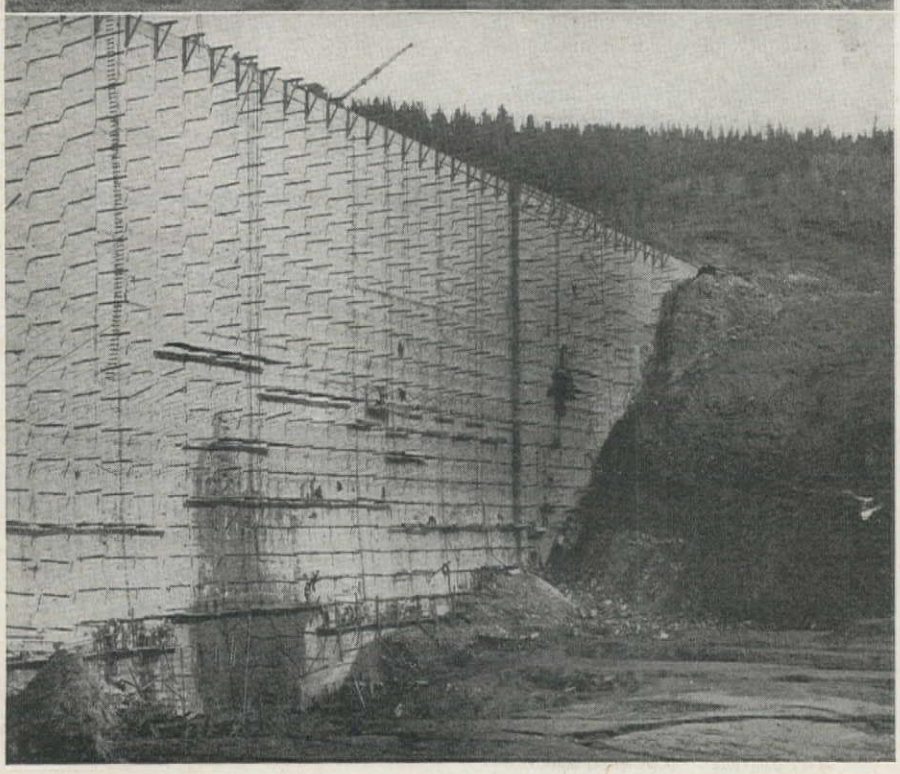
Colorado reservoir drained to permit refacing with concrete slabs and Prepakt concrete—Form slabs cast in nearby yard and held in place by grouted anchors after loose and disintegrated concrete scaled off

THIRTY-SEVEN year old Barker Dam, owned by Public Service Co. of Colorado, and situated in the Rocky Mountains about 17 mi. west of Boulder, Colo., at an elevation of 8,200 ft. above sea level, has been considered somewhat deficient in mass for a gravity-type structure, and also investigations in recent years have determined that the upstream face of the concrete structure has become badly deteriorated through frost action.

To stabilize and restore the power dam to safe and satisfactory service, the company is refacing the upstream surface by the Prepakt process. This process involves the packing of a given volume with coarse aggregate, into which the cement and water are forced by methods similar to grouting. The process has been used previously with much success in repairing cracks in tunnel linings, bridge piers and other structures and also for filling cavities in mass concrete structures. This, however, is the first time that the process has been used for completely refacing a dam or other major structure.

To accomplish this result, a wall of precast slabs made of air-entrained concrete was erected several feet out from the old face and was secured to it by lap-welded protruding dowels that were cast into the slabs and fastened to anchor bars grouted into the existing structure. Thus the wall of slabs acts as the outside form of the new face and will become an integral part of it.





Order of construction

The reservoir was completely drained early last fall by driving a drainage tunnel through the base of the dam. As the water receded, workmen on scaffolds chipped away all defective concrete in the newly exposed face of the dam. Following this operation jack-hammers drilled holes into which the anchor bolts were grouted. At the same time all loose material on the abutments was bulldozed away so that a good bond would be secured between the new facing and the bedrock.

Next a concrete base was constructed on the bedrock of both the reservoir floor and the canyon walls, and the slabs were set on it by a crane operating from

CONCRETE SLABS, which will act as forms for the Prepakt aggregate, and later become an integral part of the new upstream face are cast in a yard near the dam. Reinforcing steel is tied in steel channel forms, top; various stages in precasting, center, showing crane with concrete bucket in background. Below, workers on scaffolding scale off all loose or rotten concrete and install anchors by which the form slabs will be held in place.

Face of Dam of Concrete

the reservoir floor. A second crane was used to place the prepacked aggregate behind the slabs. As the slab setting reached the maximum height which could be reached by the crane the work was transferred to a single crane located on top of the dam. After this transfer was made, the crane set the slabs on one shift and placed aggregates during the second shift. Slotted grout pipes imbedded in the aggregate were carried upward as the filling progressed.

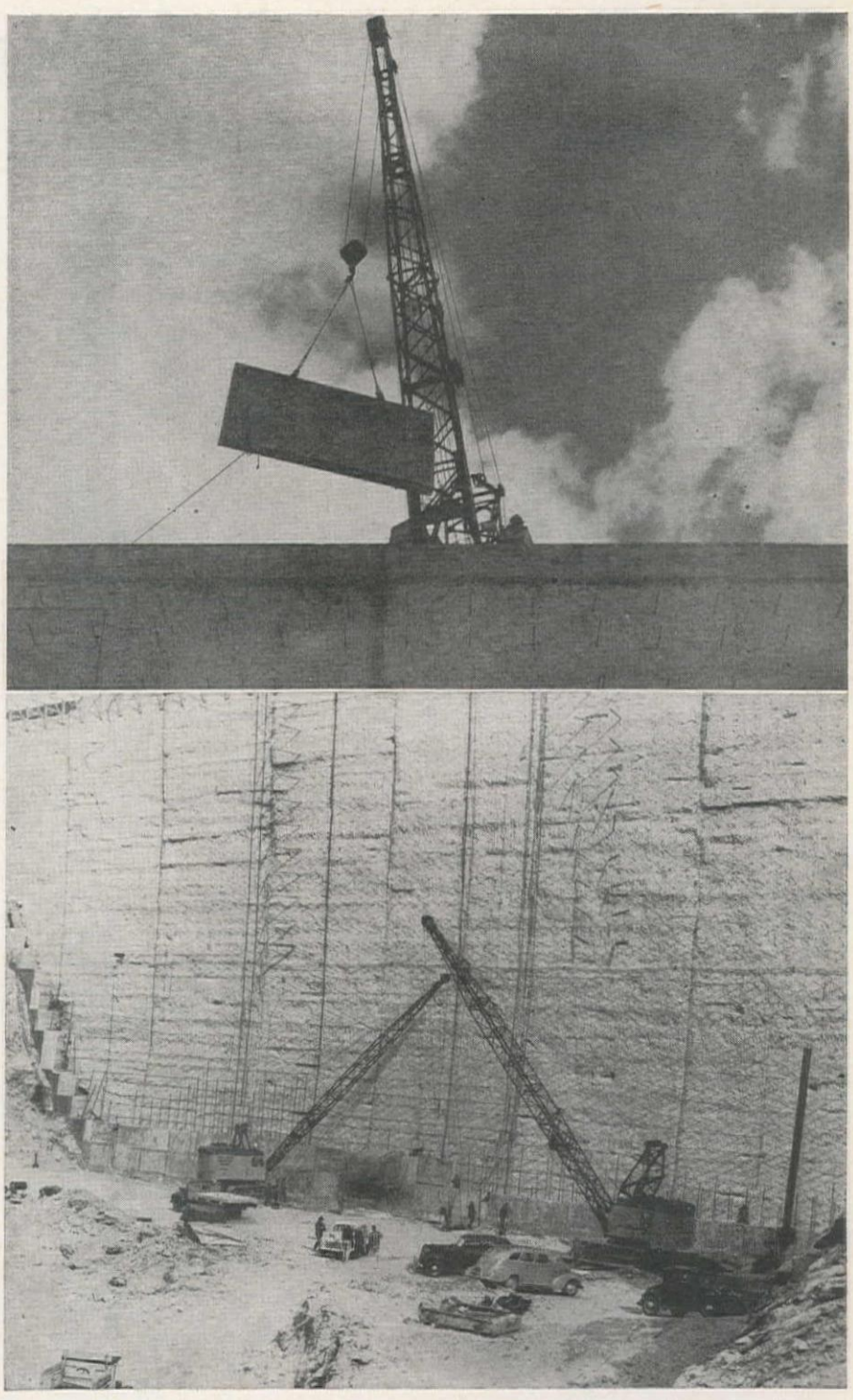
Grouting will take place after the reservoir has again been filled with water, so that the dam will be in a position of maximum strain when the new face is cast and also in order that the concrete will set under uniform and constant temperature.

The slabs were cast on concrete bases with wide flange beams for side forms. Reinforcing mats were prefabricated and suspended in the forms. Hydraulic pressure plates installed in the floor upon which the slabs were cast broke the bond between the floor and the precast units when they were ready to be moved. Upon removal they were stored in a curing area under continuous water sprays. At the completion of the curing period they were hauled to the dam by trucks and placed by crane.

Engineers for the company decided on the Prepakt method of restoring the dam's face after considerable consideration of various possible methods. One advantage of the Prepakt method of restoration, it was determined, was that it enabled work to be scheduled continuously through the severe winter months without the necessity of wasting one season's runoff.

The work is being engineered by Dr. Raymond E. Davis, consulting engineer of Berkeley, Calif., with William T. Neelands as resident engineer. For the Public Service Co. of Colorado, E. Clinton Jansen is chief hydraulic engineer and L. B. Card is mechanical engineer. Both men are closely associated with the job. The general contractor is the Prepakt Concrete Co. of Cleveland, Ohio, for which John Hofer is general superintendent.

John R. Austin Construction Co. of Denver is the sub-contractor on setting the slabs and placing aggregate.



PLACING SLABS which will act as forms was accomplished by cranes. First a solid wall was built along ground line (bottom picture) as base for slabs. Lower slabs were set by crane, with second crane filling behind them with aggregate. When the wall of slabs got too high, slabs were set and aggregate placed by crane on top of dam (top).

Bureau Laboratory Buys New Testing Machine

A UNIVERSAL testing machine for its laboratories in Denver has been ordered by the Bureau of Reclamation, according to a recent announcement.

The new machine will be used for structural tests of unusual or complicated shapes. Engineers have expressed the belief that as much as 25 per cent of the cost of some materials could be saved through more accurate testing.

The testing machine will be of the vertical hydraulic type, having a capacity of 5,000,000 lb. in compression and 5,000,000 lb. in tension. The contract for the machine, resulting in a net delivered cost to the government of $406,341, was awarded to the Baldwin Locomotive Works, Eddystone, Penna. The machine must be delivered in 12 months.

"The Bureau of Reclamation has been using a 4,000,000-lb. capacity testing machine, which was installed in 1931, and which is the property of the Bureau of Standards," Commissioner of Reclamation Michael W. Straus said. "But for many years it had been realized that the machine was inadequate for making a great number of the tests the laboratories were called upon to perform in connection with the solution of design problems."

The present machine, the Commissioner said, is a straight compression type, with no facilities for making tension tests. He also said that many improvements have been developed in load measuring mechanisms since the machine was installed.

City Transit Solution Offered

San Francisco Technical Committee of the Administrative Transportation Planning Council reports offering solution for immediate relief of city traffic congestion—Majority of sixteen projects proposed are for thoroughfare and street construction and transit improvement

SAN FRANCISCO, whose streets and transit system have long been a cause of civic embarrassment, a fact which has been aggravated to enormous proportions by the recent thirty per cent increase in population plus maintenance deterioration during the war years, is now considering a comprehensive program for immediate improvements.

A total of sixteen projects have been recommended for traffic, transit and thoroughfare improvements for the city by the Technical Committee of the Mayor's Administrative Transportation Planning Council. Falling into four major categories, they consist of: (1) Projects requiring financing by general obligation bonds; (2) Projects to be financed with current funds of the city departments directly concerned; (3) Projects requiring legislative action only; and (4) Projects requiring public support and execution.

The recommendations made by the technical committee, which consists of J. H. Turner, Manager of Utilities; H. C. Vensano, Director of Public Works; T. J. Kent, Jr., Director of Planning; and M. Riordan, Deputy Chief of Police, are based upon the Master Plan of Transportation, adopted by the City Planning Commission in December, 1945, and do not in any way prejudice the advancement of its larger long-range features.

Projects summarized

Briefly summarized, the projects proposed consist of (A) Major thoroughfare and street construction projects; (B) Transit improvement projects; (C) Traffic alleviation projects; and (D) Miscellaneous projects.

Project No. 1, the major thoroughfare and street program (see accompanying illustration) would involve a total estimated cost of $15,235,000 and would include: (1) Embarcadero underpass at Market Street; (2) Market-Portola Freeway; (3) 13th Street lateral to Bayshore Freeway; (4) Broadway tunnel; (5) Seventh Street extension across Market Street; (6) Post-Geary connection between Divisadero and Broderick Sts.; (7) Bryant Street connection to The Embarcadero; (8) Gough Street extension across Market Street; (9) Improvement of gore corner at Oak and Market Streets.

The second project in that category calls for track removal and street reconstruction at a total estimated cost of $10,500,000, while Project No. 3 asks for installation of modern synchronized three-light traffic signals on most thoroughfares at a total cost of $2,736,000. Administration, engineering, contingencies, etc. for Projects No. 1, 2, and 3, would involve setting aside another $1,529,000, which would bring the total estimated cost for the entire major thoroughfare and street bond issue to $30,000,000.

Transit improvement projects

Modernization and rehabilitation of the entire municipal transit system through replacement or reconstruction of equipment, tracks, shops and garages, and electrical system, in accordance with the modified Newton Plan, constitutes Project No. 4 on the committee recommendation. Involving a total estimated cost of $20,000,000, the project would be financed through issuance of general obligation bonds.

Payment of debt to the Market Street Railway Co., by issuance of general obligation bonds is proposed Project No. 5. The estimated remaining debt due as of June 30, 1947, is $2,200,000. Enactment of necessary legislation and issuance of general obligation bonds for the acquisition of the operative properties of the California Street Cable Railroad Co. is Project No. 6. Total transit bond issues proposed amount to $22,200,000.

Several alternate recommendations were made for Project No. 7, disposition of cable car lines. These included: (1) Replacing all cable car lines with suitable modern equipment; (2) Replacing all cable car lines with suitable modern equipment, with the exception of the California Street line, which shall be operated from Market Street to Presidio Avenue; (3) Replacing all cable cars with modern equipment with the exception of a combined Powell-Hyde line from Market Street to Fisherman's Wharf operating on Powell, Jackson and Washington and Hyde Streets. (If this proposal is accepted, a bond issue in an amount sufficient to pay for the rehabilitation of tracks, cars and other equipment for this route must be voted.)

Traffic alleviation projects

A one-way street program, consisting of enactment of legislation establishing additional one-way streets and amending certain existing one-way street legislation is proposed for Project No. 8 of the program. Establishment of additional short-time parking facilities within the Metropolitan Traffic District and long-time facilities on the fringes of this district, the latter located on or provided with mass transit lines, is recommended for Project No. 9. Establishment of a land purchase revolving fund to be used to effect this program was also recommended, at a total cost of $5,000,000.

Enactment of legislation fixing a Metropolitan Traffic District and extending no-stopping and no-parking controls to most transit streets and vehicular thoroughfares in this district, and fixing certain parking limits, together with enactment of legislation clarifying and amending existing intersection turning regulations, are proposed Projects No. 10 and 11.

Elimination of all angle parking, installation of parking meters to aid in enforcement of time-limit parking, and enactment of legislation requiring provision for off-street merchandise delivery facilities in certain buildings to be built or undergoing major reconstruction, comprise the remaining three projects in the traffic alleviation group.

Miscellaneous projects

Establishment of a staggered working hours program was recommended as Project No. 15, intended to relieve peak hour congestion through the voluntary action of employers. Final project in the recommendations was a program for the construction of modern street lights in the amount of $350,000 annually from funds provided in the annual budget in accordance with the recommendation of the Citizens' Post War Planning Committee.

Other recommendations

The Technical Committee also recommended that the Administrative Transportation Planning Council and its Technical Committee be established on a permanent basis and that the Technical Committee be instructed (1) to complete all sections of the comprehensive transportation plan, and (2) to coordinate all construction programs affecting transportation. It was also recommended that funds be provided in the 1947-48 budget of the City Planning Commission for the employment of consultants in the execution of the program.

The council's report stressed the fact that the only ultimate long-range solution to the separation of different types of traffic is a new street pattern molded to the requirements of motorized transport. San Francisco's street pattern, laid out in 1870, is so congested there is no distinction between the various functions of streets: in the standardized gridiron pattern, the 40-mile-an-hour automobile and the 25-mile-an-hour street car and the four-mile-an-hour pedestrian conflict with one another to such an extent that at heaviest points of congestion, such as

Fifth and Market Streets, none can go faster than two miles an hour.

Temporary relief offered

One-way streets, modern synchronized traffic signals, on-street parking regulations; and staggered working hours by which the peak hours of congestion would be flattened, all can temporarily at any rate relieve congestion. A clear distinction must be made between routes which will serve as major thoroughfares and routes which will be local access roads, something which was neglected when the gridiron streets were laid out. Major thoroughfares can be classified in two categories: main highway routes and major city streets.

The Major Thoroughfare Plan of the committee shows the state highway routes within the city as now provided for through traffic. Proposed state legislation, which provides for improvement of such routes would expedite completion of the Bayshore Freeway, entering the city from San Mateo. Other legislation under consideration would provide for incorporation of an additional 7.8 mi. of highway into the state system. The Embarcadero Freeway, the Bay Bridge approach to Golden Gate Bridge approach; Alemany Boulevard, San Jose Ave. to Junipero Serra Blvd.; and the Panhandle Blvd.; Nineteenth Ave. and Park-Presidio Blvd. to Division St. ramps of the Bayshore Freeway, are the three thoroughfares recommended by the committee to be incorporated into the state system.

City-financed boulevard

Since most of the major highways in the Major Thoroughfare Plan fit most logically into the proposed system of state highways, there is only one main boulevard included in the committee proposals which would be financed at this time by the city of San Francisco. Elimination of bottlenecks and improvements to major streets comprise the rest of this part of the program, at a total cost for bond issue financing of $15,235,000.

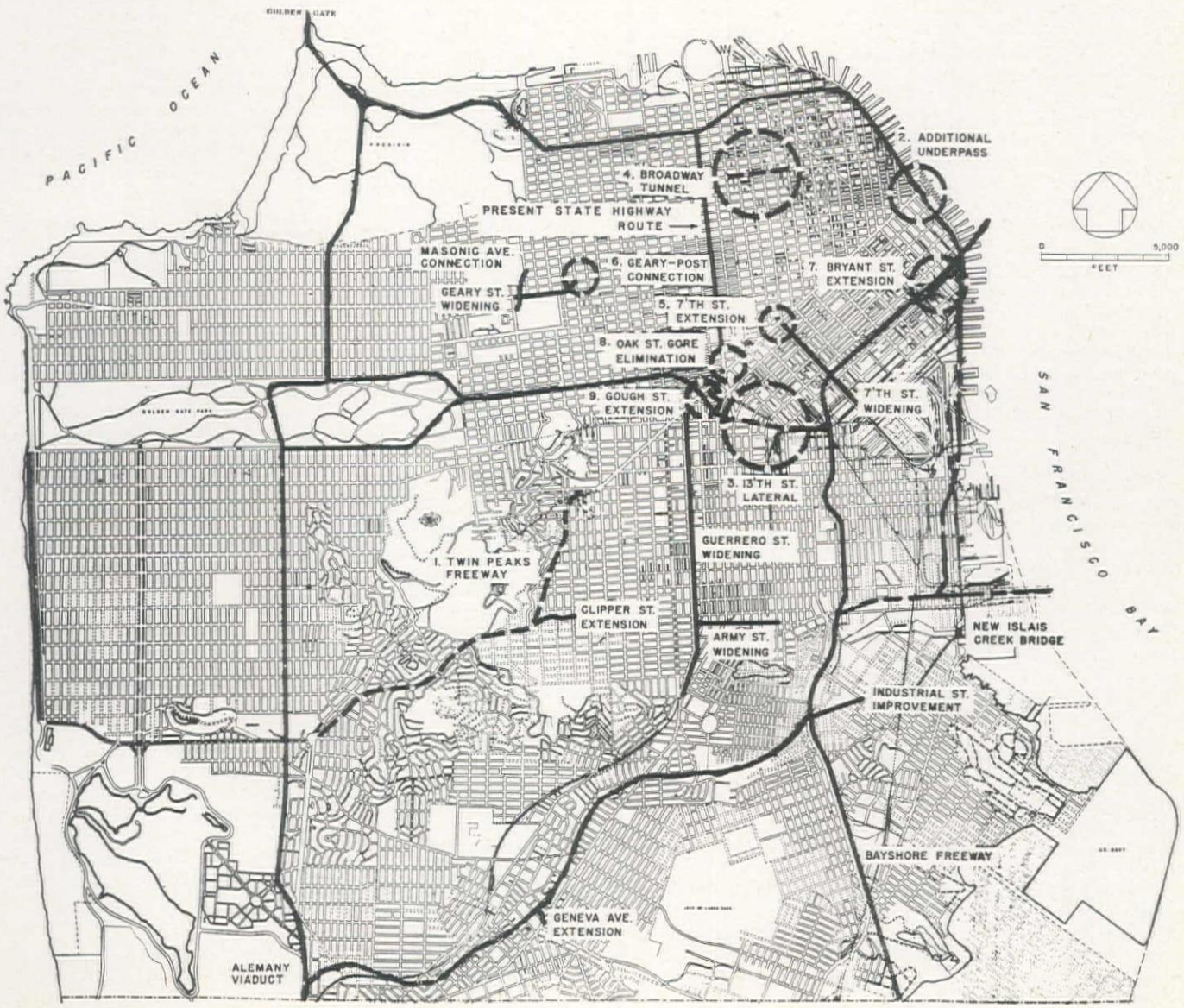
The Market-Portola Blvd., which links the central district with residential districts west and south of Twin Peaks is a heavily traveled route already loaded beyond safe capacity, it was stated in the report. The existing roadway of upper Market is narrow, the alignment is poor, and the grades excessive, with the width of the street varying from 70 to 100 ft. between property lines.

The proposed project will provide six lanes for traffic with a dividing center strip. From Castro St. to the vicinity of O'Shaughnessy Blvd. the thoroughfare would be constructed as a freeway providing a grade-separated, limited-access, high speed route around Twin Peaks. West of O'Shaughnessy Blvd., the highway would have two 41-ft. roadways and a planted center strip 8 ft. in width, providing a 6-lane, signalized thoroughfare.

Car track removal

During the past ten years, under the Market Street Railway operation, very little has been done toward major track repair work, with the result that streets occupied by such car tracks are in a bad state of disrepair. Pavements have suffered also as a consequence, since it was impossible to repair one without the other. Since the City of San Francisco

CITY major thoroughfare and street program would include: (1) Market-Portola Freeway; (2) Embarcadero Underpass; (3) 13th St. Lateral to Bayshore Freeway; (4) Broadway tunnel; (5) 7th St. extension; (6) Post-Geary connection; (7) Bryant St. connection; (8) Oak St. gore elimination; (9) Gough St. extension.



has acquired the properties, the question has arisen whether to repair or remove the tracks.

One of the most important parts of the Technical Committee's recommendations has to do with track removal and reconstruction. Under the overall plan of the Public Utilities Commission, it is now proposed to remove nearly 160 mi. of single track, replacing street car operation with either motor busses or trackless trolleys. The Technical Committee project provides for the removal of all street car tracks which have been or will be abandoned as a part of the mass transit system of the city and for reconstruction of the streets involved from curb to curb.

Since a program such as this would tend to be most important, the committee recommended that the cost of this should be included in the Major Thoroughfare and Street Bond Issue for administration by the Department of Public Works. Reconstruction of currently used car tracks would, however, be included in a proposed Municipal Railway Rehabilitation Bond Issue.

Traffic signal program

Traffic signals, while not necessary on freeways, are an inherent part of the design for surface streets. A comprehensive system of modern three-light traffic signals has been recommended installed on some of the major highways and major streets throughout the city. The entire system will cost less than the construction of one mile of freeway but is expected to produce justifiable benefits in proportion to its cost on a city-wide basis and will tend to temporarily alleviate congestion.

Signals will be located primarily in the central business district and on the streets leading into and out of that district. In addition, however, signals are to be provided on the principal circumferential and crosstown thoroughfares, providing for the free movement of traffic between outlying districts. All signals will be timed in accordance with a flexible progressive system to permit continuous movement of traffic at a designated speed.

To provide continuous three-light traffic signals on the streets would constitute a total estimated cost, including signals, conduits, cables, controls and complete installation, of $2,736,000.

Transit plan

The transit system of San Francisco, as well as the thoroughfare pattern is a remnant of days which no longer exist. The recommendations of the Technical Committee would guarantee it a long-desired face-lifting.

The Ferry Building, for 80 years the terminus of all major San Francisco traffic routes, where 55 million persons per year passed under its tower, today greets an average of 2 million persons annually. The bridging of the bay has resulted in a dispersal of transit lines.

Little new equipment has been purchased in the past decade by the Municipal Railway. The properties of the Market Street Railway, particularly, had deteriorated greatly in the past 10 years. The sum required to rehabilitate the system is a large one, and should, the committee suggested, be provided for by a bond issue. Public support for such a bond issue can be expected only if there is a clear and evident demonstration of the principles upon which the plan for transit improvement is based and of the benefits which can be derived from its effectuation.

Features of the postwar transit plan, prepared by L. V. Newton, consulting engineer for the Public Utilities Commission in April, 1945, made several salient recommendations which were approved by the Technical Committee. Among other things, it recommended that outlying districts of the city be linked closer to central areas by the provision of "express" service in separate vehicles which pass through the inner districts where "local" service is provided. The plan also suggested rerouting so that it would be possible to go from any district in the city to another with a maximum of one transfer.

The number of lines operating radially to and from the Ferry Building and the lower end of Market St. were recommended reduced, to be replaced by through routes between areas of commercial and industrial concentration on opposite sides of Market St. More circumferential routes will be provided, reducing unnecessary trips into the business district, and a number of bus loop routes are also to be established.

Where flexibility is required and where express service is planned, new motor coaches and routes are proposed. An estimated $20,000,000 is the amount of the proposed bond issue for rehabilitation of the transit system, with new equipment comprising $10,517,000, and way and structures totaling the other $9,483,000.

The removal of abandoned tracks in paved streets and the restoration of the pavement will be covered by a separate bond issue for general street improvements.

Construction program

A year or longer would probably be required for delivery of materials and equipment for a railway rehabilitation program, it was estimated. Work should also be started on some of the buildings at the earliest possible moment, it was urged, so that new equipment can be properly cared for when delivered. Not less than half of the bonds would have to be sold immediately after their authorization, since the buildings represent the largest item of expense. Altogether, it would take an estimated 5 or 6 years to complete the rehabilitation project.

If the bond issue were to be sold immediately upon approval, the annual cost would amount to $1,400,000. If only one-half the bond issue were to be sold immediately, however, annual cost for the first 2 years would be $1,200,000.

Funds amounting to at least $1,200,000 are available now from monies appropriated for such items as new equipment, betterments and reconstruction and replacement. These funds, however, are needed today to maintain properties in an operable condition.

Disposition of cable cars

Realizing that public reaction is distinctly unfavorable to the removal of cable cars, the Technical Committee nevertheless recommended conversion of all cable car lines into more modern means of transport—eventually, trolley coaches.

The cable cars, the committee stated, are inadvisable in a modern city because of three factors. They are: (1) Interference with the flow of traffic and with the operations of other forms of mass transportation; (2) Safety; and (3) Financial loss involved.

The major portion of the city's cable car mileage runs at right angles to the principal arteries heading toward the downtown business district. At some of the intersections, cable cars can only stop to discharge passengers in the middle of the street, thus tieing up traffic in both directions. The accident rate in 1946 was also high, with the 716 accidents involving Municipal Railway cable cars resulting in payment of $87,215.54 in accident claims.

Because of deterioration of equipment, the committee claimed, ordinary hazards of cable car operation have almost trebled. Cable car rails are worn thin, slots are warped, and cables currently being manufactured are very inferior.

Rehabilitation costs would be much more exorbitant than those incurred by substituting motor coaches for cables. The cable car system now municipally owned would operate at an annual loss of $267,468 as compared to a net profit of $123,262 if motor coaches were substituted.

Alternative solution

Because there is so much public feeling in favor of retainment of the cable cars, the committee recommended two alternative proposals to the council. First of the two is to abandon the presently owned municipal cable car lines and continue operation of the California Street section of the California Street Cable Railroad, eliminating the Jones shuttle and the Hyde-O'Farrell St. operation. Its condition is such that it could be operated longest with the least subsidy and the least amount of reconstruction. Continued operation of this route would fit best into the overall traffic and transportation plan than any other cable line.

The other recommendation would be to abandon the California Cable Railroad operation and continue the Powell St. line in operation between Powell and Market and Fisherman's Wharf. This would involve elimination of the Washington-Jackson section and the routing of the Powell line from Market to Jackson, west on Jackson to Hyde and north on Hyde to Fisherman's Wharf. It would be a combination of the existing Powell route with a portion of the California Cable Railway.

Other projects

Traffic flow through narrow San Francisco streets would be greatly aided, the committee stated, by instituting a

SCOPE OF BOND ISSUE

Following is an estimate of the proposed bond issue, totaling $20,000,000, for the rehabilitation of the municipal transit system:

Equipment		
Street cars, multiple unit, 55 at $31,000	$ 1,705,000	
Trolley coaches, 361 at $20,000	7,220,000	
Motor coaches, 40-passenger, 32 at $16,750	536,000	
Motor coaches, 36-passenger, 66 at $16,000	1,056,000	
		$10,517,000
Way and Structures		
Track reconstruction, 26 miles	$ 3,365,000	
Trolley coach overhead, 164 miles	2,560,000	
Substations and feeders	1,500,000	
Carhouses, garages, and shops	2,618,000	
Sub-total	$10,043,000	
Less existing appropriations	900,000	
Net way and structures		9,143,000
Total road and equipment		$19,660,000
Removal of abandoned property		340,000
Total Bond Issue		**$20,000,000**

It is obvious from the above that an important transition from street car to trolley coach and bus operation is contemplated by the program. The aggregate result is graphically represented by the following table:

	Miles of Routes (Round Trip)		Vehicles Scheduled (Maximum)	
	Present	Proposed	Present	Proposed
Electric cars	371	144	509	256
Trolley coaches	17	220	18	399
Motor Coaches	265	*318	200*	267
Total	653	682	727	922

*This does not include motor coaches used to replace street cars at night and other off-peak hours.

ystem of one-way streets. On narrow oadways three lanes of one-way traffic an be derived where only one lane in ach direction is now obtained. Left irns against opposing traffic will be also voided thereby. The only additional ajor one-way streets recommended in ie report are Bryant and Harrison as a air to serve the Bridge and Bayshore reeway in the neighborhood of their inction, and Oak and Fell Streets as a air to provide the first stage of de-elopment of the Panhandle Freeway.

Three small but important streets are so recommended to be made one-way, amely, Hawthorne Street, Ecker Street, nd Hotaling Place. Enactment of legis-tion would be necessary to do so.

Additional short-time off-street park-g facilities within the new Metropoli-n Traffic District and long-time off-reet parking facilities on the fringes f the district were recommended as an-her aid toward alleviating the traffic tuation. The establishment by the city f a land purchase revolving fund to aid is program through the issuance of eneral obligation bonds in the amount f $5,000,000 was also recommended.

Legislation toward on-street parking, o stopping and time-limit parking plans as also recommended, as well as a stag-ered working hours program and an tensive street lighting program.

In making their recommendations, the echnical Committee stated that while ie projects as a group were of vital importance, no one familiar with the transportation problems in the city could fail to realize that the plans herewith presented did not constitute a complete solution. It was therefore recommended that the Mayor establish the ATP Council on a permanent basis with a technical coordinating committee to complete the transportation plan and coordinate all construction programs.

The committee stated that the only long-range solution to the transit problem would be provision for subways for mass transit vehicles in the downtown area. Regardless of the ultimate solution, however, it was stated that all of the proposed immediate bond issue projects are vitally needed now.

Montana to Consolidate State Lab Facilities

CONSOLIDATED LABORATORY facilities may be constructed in Montana for the highway department, water conservation board, board of health, and livestock sanitary board, if a law adopted by the 1947 state legislature is approved by the voters in a referendum election next year. The law substantially follows recommendations of a state laboratory commission composed of the state highway engineer, chief engineer of the water conservation board, executive officers of the health and livestock sanitary boards, the commissioner of agriculture, the state purchasing agent, and the attorney general.

The commission plans call for a reinforced concrete structure with a floor plan in a modified "W" shape to provide the maximum amount of north light. Highway and water conservation board laboratories would be placed on the first floor while the other two boards would occupy the second and third floors. Special laboratory facilities such as steam, compressed air, hydrogen, oxygen, distilled water, and vacuum would be generated in the central wing of the building and distributed throughout the building.

Studies by the commission indicated that a minimum of about 52,000 sq. ft. would be required by the four state agencies that will share the new building. Original estimates placed the cost of the building at $880,000, but the allocation by the legislature was $600,000. Although funds will come from the state capitol land grant fund, the expenditure must be approved by the voters of the state before construction can proceed.

Utility Extensions to Be Constructed at Eugene

PLANS ARE RAPIDLY being completed for extensive public utility expansions at Eugene, Ore., with bids already having been received for a hydraulic turbine and generator for the hydroelectric plant at Leaburg. Plans for a new $556,000 hydroelectric plant at Walterville are being completed by engineers of the Eugene water board under the direction of H. P. Currin, chief engineer. The plant will have a 5,000-kw. capacity.

A new filter plant will be constructed at Hayden bridge and plans for this $750,000 project are being completed by Stevens & Koon, consulting engineers of Portland. A pipe line from the plant to the city is expected to cost an additional $622,000. It is expected that bids for construction of the filter plant and the pipe line will be requested in a month or two. Nearly half of the materials required for the pipe line are already on hand at the plant of the Steel Tank & Pipe Co., Portland, which will fabricate the pipe.

Other projects planned for construction in the near future include a 66-kv. transmission line 8 mi. in length for the Leaburg system which will be constructed as work progresses on the other portions of the project. Miscellaneous water main expansion and maintenance has been budgeted at $236,500, and the same item in the electrical distribution system at $352,200.

Three additional projects have been placed on the future construction list for one to three years ahead. They are a 25,000-kw. steam generating plant in the city to cost $1,700,000, and two reservoirs for the water system, one at Chula Vista, and the other at Fairmont. All of the improvements contemplated in present plans are budgeted at more than $5,000,000.

A.S.C.E. Spring Meeting at Phoenix

First Society convention ever to be held in Arizona proves complete success from technical, entertainment, and business standpoints—Nearly 600 delegates, students, and ladies registered — All day student session, featuring oratorical contest, a new departure for Society meetings—Controversies over airport engineering and Colorado River water feature technical program

By JOHN M. SERVER, JR.
Editor, Western Construction News
San Francisco, Calif.

ANYONE WITH a pet peeve seeks to express it from every available platform. The State of Arizona is no exception. Nor is the State of California.

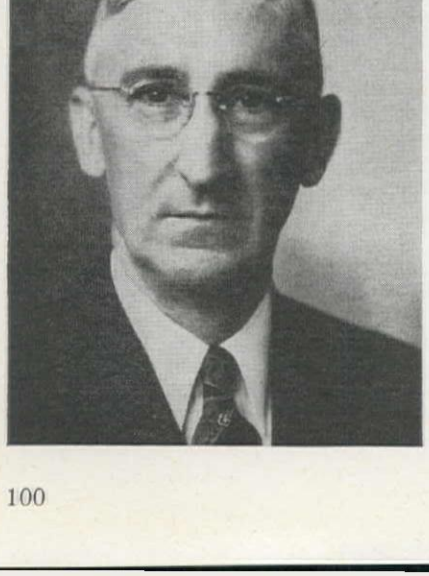
Arizona engineers provided for the American Society of Civil Engineers' spring meeting at Phoenix last month one of the finest conventions it has ever been our privilege to attend, based on the measure of hospitality, entertainment, friendliness and setting. But neither the engineers, the lawyers, nor the newspapers were able to resist pouring into the ears of the assembly, a steady barrage of patter about their version of their dispute with California over waters of the Colorado River.

Nor was California any less belligerent in intention. They merely had less opportunity, the convention being held on their adversary's home grounds, to weary the delegates with their legal discussions. The controversy had no place in the discussions. The distribution of the Colorado's waters is a legal question, on which the A.S.C.E. could render no verdict, or even express an opinion.

The Board of Direction rightly and delicately went as far as it could when it passed an embarrassed and wholly innocuous resolution urging the two states to get together and arbitrate their differences. This is so far from original that it might well have been left undone, but in view of the uncomfortable situation contending speakers had placed them in, might be considered a masterpiece of polite restraint.

This tiring argument over water law and a brightly refreshing controversy over the relationship of the engineer and the airport were the features of the technical program, although many other interesting papers were also presented, and an interesting and valuable innovation was undertaken in the extensive program carried out for student members.

EDGAR M. HASTINGS, National President of A.S.C.E. presided at the Convention and sessions of Board of Direction.



Pre-convention activities

Altogether about 600 engineers, students and ladies were registered, including delegates from virtually all of the Western States, and Society officials from New York and other eastern points. The official convention was preceded by several days of meetings by the Board of Direction and various committees.

For the two days immediately preceding the official opening of the convention a well-attended meeting of local section presidents, secretaries and official representatives was held under the chairmanship of Director Fred Scobey. Representatives of four California sections, three Washington sections, and those in Arizona, New Mexico, Texas, Oregon, Montana, Utah and Colorado were in attendance.

Topics discussed included increasing membership, organization of sections, collective bargaining, technical programs, increase in Society dues, junior activities, and many other subjects. The local section delegates were the guests of the Arizona Section at a dinner one evening.

Convention sessions

The main sessions of the convention opened on Wednesday, the 23rd, with the customary addresses of welcome, and a luncheon program that was almost fantastically exceptional. An Arizona photographer displayed the most beautiful colored slides of the state's many beauty spots, and Dr. Rhes Cornelius told most explicitly and convincingly of his experiences in the manufacture, testing and use of the atom bomb.

Dr. Cornelius, a man of very small stature, detailed the scientific developments through which atomic knowledge had grown, and gave much credit to the engineers for their contribution in constructing the several great manufacturing plants. He told of witnessing the test blast in New Mexico, and finally, because of his light weight, being selected as the scientist representative aboard the B-29 which was to drop the bomb on Hiroshima. His was the task of making last minute adjustments and settings to the bomb and speeding it on its way. He had the misfortune however, to fall through the bomb bays after the bomb and barely managed to get his parachute opened before losing consciousness. High winds blew him out of the range of the explosion. He regained consciousness as he was being roused by the stewardess of a passenger plane between Washington and New York! The whole fantastic experience was a dream.

But Dr. Cornelius recounted the dream so realistically that absolutely every listener was completely fooled. The doctor, who is an L.L.D., explained he was proving the point that you can't believe everything you hear. It is to be hoped that some of the water statesmen at the convention will remember his message and their own sad awakening when they learned the tale was built of whole cloth.

Wednesday afternoon opened the water question officially, when in the irrigation division, Charles A. Carson, Arizona attorney, delivered an oratorically vigorous but scientifically inconsistent paper on "Utilization of Colorado River Water in Arizona." In different portions of the paper, for instance, he calculated the average water requirement in the state as 1.5 ac. ft. per ac., and 3 ac. ft. per ac. Further, he claimed for Arizona 3,800,000 ac. ft. annually of Colorado River water, a figure arrived at by taking the total water of the river, including all possible excess water, deducting nothing for the water granted to Mexico by the unfair treaty of 1944, and allowing California none of the excess, even though the Compact clearly grants her one-half of all such water. The humor-

WM. N. CAREY, National Secretary of the Society took care of business problems in a very efficient manner.

ous thing about these dubious mathematics is the fact that Arizona is entitled at best, under her contracts with the U. S. Government, to 2,800,000 ac. ft.

The remarks were answered by E. E. Elder, hydrographer of the Metropolitan Water District of Southern California, who in his turn, neglected to give Arizona any credit for re-using the waters of the Gila, a Colorado tributary, and made other debatable statements. The whole exhibition was so inexcusable that a member in the audience was moved to express his dissatisfaction and urge the chairman to proceed to other business. This was done, but repercussions and repetitions were continually heard throughout the remainder of the convention, in sessions and in the halls.

Other papers heard by the Irrigation Division were one on "Pumping Plant Design" by Julian Hinds, and on administrative control of ground water, read for Harold Conkling. At the same time, papers on various phases of surveying were heard by the Surveying and Mapping Division, and the Highway Division was hearing three very interesting presentations. They were "Durability of Highway Substructures and Surface," by Donald J. Steele of the Public Roads Administration; some of Arizona's highway problems, discussed by E. V. Miller, Planning Engineer of the Arizona Highway Department; and "Freeways and Parkways" by Lloyd Aldrich, City Engineer of Los Angeles. Aldrich cited the traffic congestion in his city and briefly outlined some of the 613 mi. of freeway plans for reducing it, and also cited specific savings in time and money to users of already constructed portions of the Los Angeles system.

Second day's sessions

On Thursday the 24th, the Construction Division was addressed by L. R. Douglass, assistant director of Region III of the Bureau of Reclamation; Capt. Alden K. Fogg, Navy Public Works chief at San Diego, Calif., and R. F. Blanks, research chief of the Bureau of Reclamation. Douglass spoke on "Construction of Davis Dam"; Fogg on the "San Diego Aqueduct"; and Blanks on a "Reappraisal of Concrete Aggregates." Regrettably no time was permitted for discussion or questions on these papers, although it was understood several enlightening extemporaneous comments were available.

Three very worthwhile papers were delivered in the Hydraulics Section, where sedimentation was the theme. D. C. Bondurant outlined sedimentation studies at Conchas Reservoir in New Mexico; W. E. Corfitzen explored the enormous effects of reservoir sedimentation, and J. W. Stanley discussed conditions along the Colorado River after construction of Hoover Dam.

In the Power Division, John T. Kimball spoke on "Arizona Power Requirements," followed by discussion by W .W. Lane and Malcolm Bridgewater; and Harvey McPhail outlined "Past and Future Colorado River Power Development." Here again discussion of Arizona's legal and political position on the river found its way into the meeting.

TWO DAY CONFERENCE of local Section representatives included, seated, l. to r.: JOHN A. FOCHT, C. M. BLUCHER, Texas; NORBERT LEUPOLD, Oregon; F. W. ROBISON, Sacramento; J. E. LOTHERS, Oklahoma; T. H. CAMPBELL, Seattle; J. A. BAUMGARTNER, Arizona; R. W. JAMES, Colorado; WALTER JESSUP, ASCE Western Representative; R. L. DERBY, Los Angeles; FRED SCOBEY, Society Director. Standing l. to r.: E. L. CHANDLER, ASCE Representative, Washington, D. C.; JOHN M. SERVER, JR., Editor, *Western Construction News*; C. E. ANDREW, Tacoma; C. R. MOORE, Spokane; RALF WOOLLEY, Intermountain; HERBERT YEO, New Mexico; P. M. JOHNSON, Montana; H. R. McDONALD, Arizona; DON REYNOLDS, Asst. Secretary, ASCE; GEORGE BRANDOW, C. R. COMPTON, Los Angeles; JOHN RINNE, San Francisco; TOM BINFORD, Los Angeles; S. T. HARDING, San Francisco, and P. W. HELSLEY, San Diego.

The Sanitary Engineering Division heard well-prepared papers on "Anerobic Digestion of Sewage Sludge" by A. M. Rawn; "Colorado River Water for Domestic and Irrigation Purposes," by G. E. Arnold, and "Engineering in Public Health" by G. W. Marx.

In the Air Transport Division, however, developed the second controversy which shook the convention, or at least threatened to do so. In a paper entitled "The Engineer and the Airport," R. W. F. Schmidt, Superintendent of Airports for Civil Aeronautics Administration, charged that engineers were often overtechnical in their development of airports, and often lacked the specialized aeronautical training needed to properly design these facilities.

The charges in his paper were bitterly disapproved by many of the engineers present, and by A. J. Ryan of Denver, Colo., whose thoughtfully prepared paper in rebuttal was read by R. W. James. However, in the discussion which followed, it was admitted and understood that Schmidt's paper had overdrawn the situation in order to bring out by "needling," the type of specifically trained engineering required for this work, to design economic fields best suited to the location and purposes they will serve.

LLOYD ALDRICH, City Engineer of Los Angeles, spoke on freeways at the Highway Division session in the Convention.

This section also heard good papers by Edward Koehm on "Airport Drainage" and E. L. Felton on "Airport Weather Determinations."

Student activities

A "first-time" activity at the convention was the strong program arranged for student members of the Society from various Western colleges. About 150 of these members were registered. Their program included addresses by President Hastings, Walter Jessup, the Society's representative in the West, Directors G. Brooks Earnest, Oscar H. Koch and Thomas M. Lowe; a student chapter luncheon; a forum on chapter problems; and the finals of a speaking contest which had been conducted in the various Sections.

Seven participants presented papers at the session. First place was awarded to Warren D. Curtis of the University of Utah, representing the Intermountain Section, who spoke on "Soil Compaction." Second award was won by William L. Sparks of University of Arizona, representing the Arizona Chapter, speaking on "The U.S.-Mexican Water Treaty of 1945." Third in the judging was Kenneth E. Greene of University of California, representing the San Francisco Section, with a paper on "The Okinawa Calamity." Fourth award went to Irving L. Sulmeyer of California Institute of Technology, representing the Los Angeles Section, with the topic "Pride and Unity in the Engineering Profession." First prize was a cash award of $40, second an award of $25,

STUDENT chapter orators at the convention included, seated l. to r.: ELVIS L. BEARDEN, University of Texas; WILLIAM L. SPARKS, University of Arizona; and KENNETH E. GREENE, University of California. Standing, l. to r. are: WILBUR W. SQUIRE, University of Colorado; EUGENE M. ZWOYER, University of New Mexico; WARREN D. CURTIS, University of Utah; and IRVING I. SULMEYER, Caltech.

and third and fourth received their choice of numerous books. Papers were limited to 15 min. in presentation.

The other speakers were Elvis L. Beardon, University of Texas, speaking on "Oil Lease Layout and Development in Relation to Salt Water Disposal"; Wilbur W. Squire, University of Colorado, "Altimetry as an Aid in Map Making"; and Eugene M. Zwoyer, University of New Mexico, "Prospects for the Engineering Graduate."

Other activities

The Arizona Section committee, headed by Walter Johannessen, president, did a truly remarkable job of entertaining the delegates and their ladies. Leigh Gardner, chairman of the registration committee, worked day and night to make arrangements for the delegates' accommodations. The Entertainment Committee, under the leadership of Fred Guirey, kept the guests busy at interesting activities every spare moment not spent in technical sections.

The social activities they arranged included an evening in a Wild West setting at the Valley of the Sun Studio; a buffet dinner and dance at the Hotel Westward Ho; and a full day trip to some of the largest copper mines in Arizona, in the vicinity of Globe and Miami.

National officers of the Society present included President E. M. Hastings, Secretary William N. Carey, assistant secretaries Don Reynolds and Allen Wagner, Publications Manager Sydney Wilmot, and most of the directors. Director John H. Gardiner of Tucson, Ariz., was in charge of arranging the technical program.

Report Shows Building Construction For 1946 Greatly Speeded in West

AN ANNUAL REVIEW of construction in the eleven western states, reported by the Federal Reserve Bank, showed that with relaxation of restrictions in the second half of 1945, building construction began and has continued at an accelerated pace through the greater part of 1946. Private building in this district was resumed for the first time since before the war on a large scale, and data for building permits issued in urban areas of the western states, as shown in the accompanying table, aggregated about 1100 million dollars in 1946, more than double the figure for 1945.

Non-residential construction reached its peak in March, 1946, it was reported, with applications streaming in at that time in anticipation of stricter limitations on new non-residential construction which became effective at the end of that month. Throughout the year, permits for new residential building represented about 55 per cent of the total value of permits issued in urban areas of the eleven western states. Permits for non-residential building were about 30 per cent of the total, while permits for additions, alterations, and repairs made up the other 15 per cent.

While population is still growing in this area, the report states, acute housing shortages persist in many localities, a situation which promises to sustain the current residential building boom for some time, unless housing costs advance appreciably above present levels. A large number of housing projects which were started in the past year have remained unfinished for some reason, but there is also a huge potential backlog of non-residential construction including a large number of public works projects.

WESTERN BUILDING CONSTRUCTION, 1943-1946

Estimated value of building permits in urban areas of the western states (thousands of dollars)[1]

	1943	1945	1946
All building construction[2]	336,950	512,790	1,098,290
Federal	157,710	92,470	35,660
Non-federal	179,240	420,320	1,062,630
New residential construction	184,420	221,340	598,545
Federal	88,480	20,860	20,765
Non-federal	95,940	200,480	577,780
New non-residential construction	102,940	190,720	337,350
Federal	65,910	62,420	6,400
Non-federal	37,030	128,300	330,950

[1] Area includes Colorado, Montana, New Mexico, and Wyoming in addition to the Twelfth Federal Reserve District states.

Source: U. S. Bureau of Labor Statistics.

Improved Ratio Between Material Supply, Demand

THE RELATIONSHIP between overall supply and demand for the major building materials is now much more encouraging than a year ago, according to the March Construction Industry report, released by the Department of Commerce.

The Index of Production for Selected Construction Materials at the beginning of this year was more than 40 per cent higher than a year ago, the report states. This gain reflected the great progress made during 1946 toward balancing supply and demand.

At the beginning of this year all of the materials included in the Index except range boilers and unit heaters were at substantially higher levels of production than in the corresponding period of 1946. For some materials — nails, tubs, sinks, warm air furnaces, concrete reinforcing bars—production at the beginning of 1947 was double or triple that of a year ago.

Several building materials—brick, cement, concrete block and asphalt roofing —are approaching a market balance, the report states. However, supply difficulties are being encountered in certain areas because of low inventories.

Distributors' problems are expected to continue in some areas during part of 1947, particularly for insect screen cloth, building boards, plaster, water heaters and water closets.

Furthermore, the supply of many building materials may be curtailed during the first half of 1947 by an acute shortage of freight cars, which has reached a point that is causing grave concern. Many building materials firms in various parts of the country need assistance in obtaining freight cars to ship their present inventories.

CONSTRUCTION DESIGN CHART

LXXXIII... Concrete Column Pedestals for Footings

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

WHEN DESIGNING column footings, the depth required for shear and flexure is frequently found to be insufficient to provide adequate bonding of the column dowels. In order to obtain sufficient additional depth for bond, it is customary to add a pedestal on top of the footing. The pedestal might be thought of as a continuation of the column, containing the same longitudinal reinforcing as the column but with the circumferential steel omitted. Due to the omission of the ties, or spiral reinforcing, it is then necessary to increase the column size through this transition stage.

The permissible unit stress in the column pedestal is commonly specified by the relation

$$r_a = 0.25\, f'_c \sqrt[3]{\frac{A}{A'}}$$

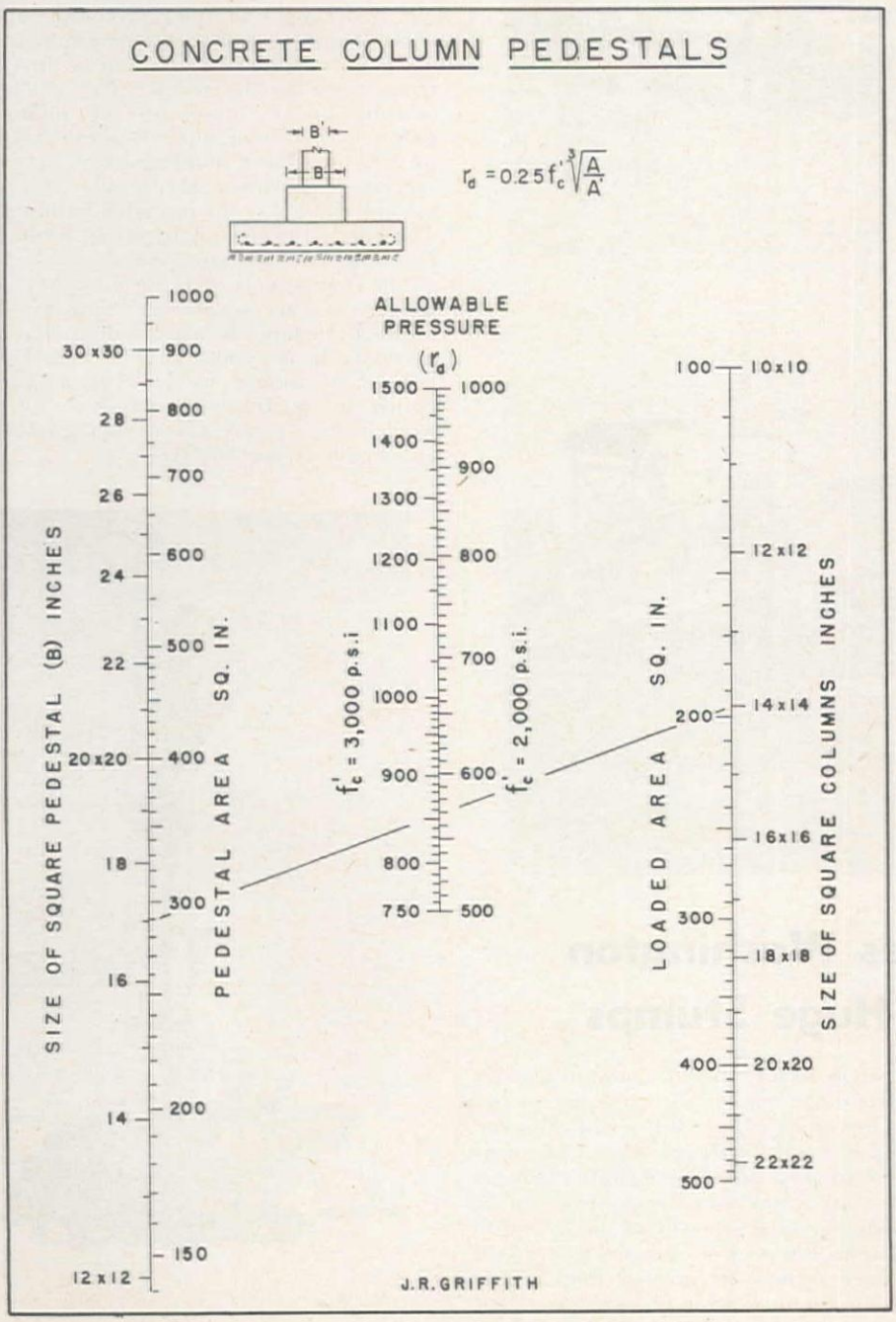
r_a = allowable unit stress over loaded area

f'_c = ultimate strength of concrete

A = total area of pedestal top

A' = loaded area at top of pedestal

The accompanying chart has been designed to solve this equation with the least amount of effort. Since we are unable to determine the allowable unit stress (r_a) until the size of the pedestal is known, solution must be made by trial. The same procedure is necessary in the solution by equation. Provision has been made on the chart for use of either $f'_c = 2{,}000$ p.s.i., or $f'_c = 3{,}000$ p.s.i. On the scales indicated for pedestals and columns, both the square size as well as the area is given.



In order to illustrate the use of the chart, I will assume the following conditions:

$f'_c = 2{,}000$ p.s.i.

Column, 14 in. square, area 196 sq. in.

Dowels, 1-in. square bars requiring a lap of 30 in. for bond

Total column load = 155 kips

Footing effective depth, $d = 12$ in. ±

Since the lap required to develop bond is 30 in., and the effective depth of the footing is only 12 in., the height of the pedestal must be 30 — 12 = 18 in. in order to make up the difference.

A solution on the accompanying chart requires a single straight line intersecting all scales. If a line (not shown) were to be drawn from a 14-in. square column on the right scale, to a 16-in. square pedestal on the left scale, the intersection on the central scale would indicate an allowable pressure of $r_a = 545$ p.s.i. Note that this reading has been taken from the scale for the assumed value of $f'_c = 2{,}000$ p.s.i. The actual stress in the assumed pedestal is

$$r_a = \frac{P}{A} = \frac{155 \times 1{,}000}{16 \times 16} = 606 \text{ p.s.i.}$$

which is higher than the 545 p.s.i. indicated on the chart as being allowable. It will therefore be necessary to assume a larger pedestal. I have drawn a solution line on the chart for a 17-in. square pedestal by which it is indicated that a stress of $r_a = 569$ p.s.i. is permissible. The actual stress would be

$$r_a = \frac{155 \times 1{,}000}{17 \times 17} = 537 \text{ p.s.i.}$$

which is less than the allowable and would be satisfactory.

Substituting in the equation as a check on the above value obtained from the chart, we have

$$r_a = 0.25\, f'_c \sqrt[3]{\frac{A}{A'}}$$

$$= 0.25 \times 2{,}000 \sqrt[3]{\frac{17 \times 17}{14 \times 14}} = 568 \text{ p.s.i.}$$

as compared to the 569 previously obtained.

When designing pedestals and column footings, I find that the use of a systematized form with blank spaces to be filled in for values obtained, even including a general sketch, is of material aid. The computation form which I have developed for my own use, covers the design of both the pedestal and footing on one sheet. Interruptions, which occur in the office, result in lost time going back to pick up my train of thought. Such lost time is at least minimized by the use of a computation form.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD

Clearing Blade Enables Washington Contractor to Uproot Huge Stumps

PAUL BUNYAN has nothing on one Washington contractor when it comes to clearing huge stumps for construction and land clearing. Equipped with an Isaacson Hydraulic Tracdozer which has a Klearing Blade in place of the usual dirt blade, the International Diesel crawler pictured above simplifies clearing jobs and reduces time and labor to a small fraction of what they used to be.

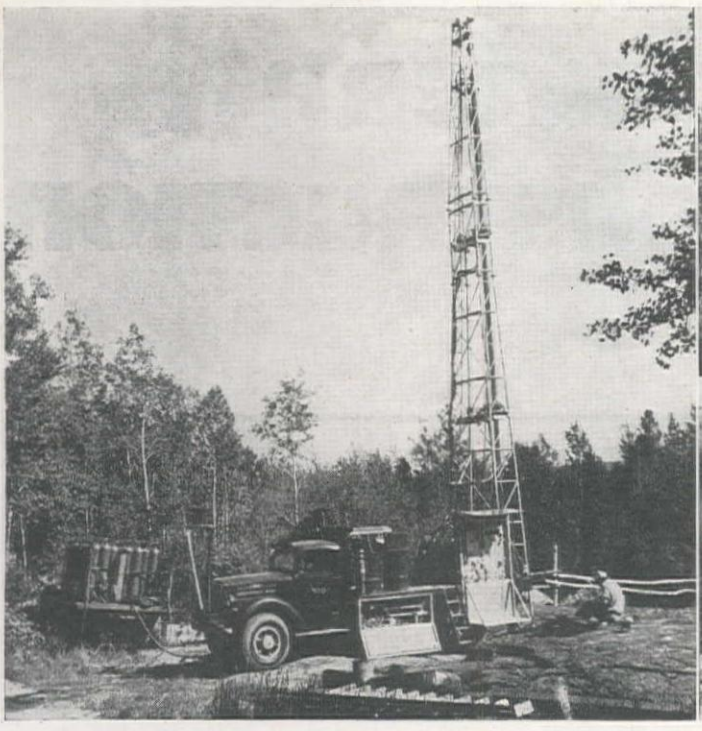
An Isaacson winch is mounted at the rear of the tractor shown above, which is driven by L. J. Carter of Monroe, Wash. Teeth of the clearing blade were used to get a purchase on roots beneath the soil which were then torn out by using the lifting power of the hydraulic system. The winch was used to drag the bigger stumps to burning piles and to pull them loose from the soil.

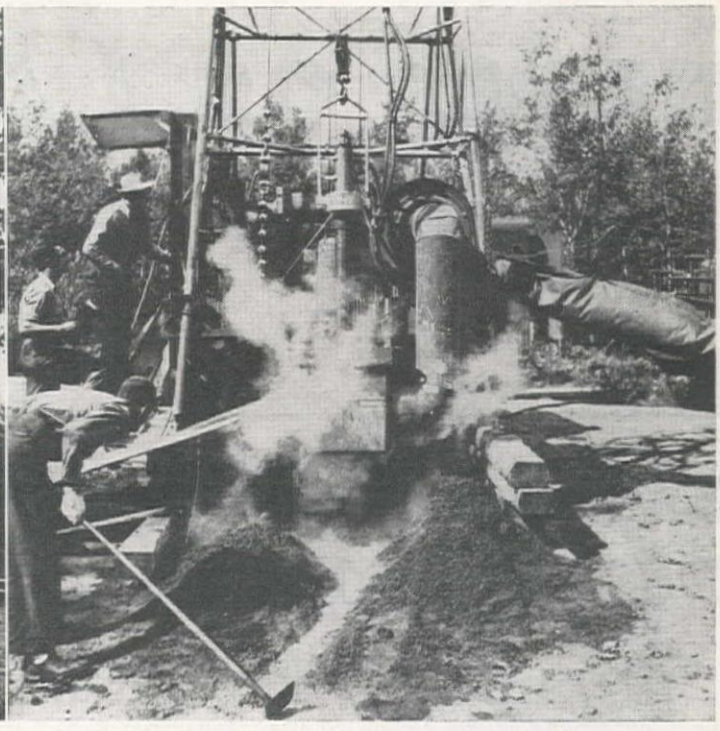
Concrete Machine Proves Time-Saver

THE ANSWER to a contractor's prayer is the revolutionary new arc welded concrete machine, which claims to save over 35 per cent in time in pouring a 40 x 80 standard concrete building. Designed by Ira J. Kuert of California, the first unit to be completed was built by The Johnson & Thomas Machine Works, Los Angeles.

The machine, which mixes and pours concrete at the same time, while traveling under its own power, completely eliminates the use of transfer equipment, as the mixed concrete is poured direct from mixer to the forms. The unique pouring tower, shown in the photograph, is 45 ft. high, but can be extended to 65 ft. for taller buildings. Erected in sections, the tower need only be extended as high as the intended building. The entire tower will tilt safely 10 deg. to compensate for any grade.

The four wheels carrying most of the weight of the tower were fabricated from 20-in. pipe by arc welding. Each wheel is 12 in. wide, and all four are housed in an arc welded frame. The entire lower frame assembly is arc welded also, as are the corner gussets and smaller wheel mounts.





Drilling Speeds Increased By Fusion-Piercing Process

INCREASES in drilling speeds ten times greater than older methods have been proven by fusion piercing, a new method of making vertical blast holes in hard, low-grade iron ore, thus making possible large scale mining operations at lower costs.

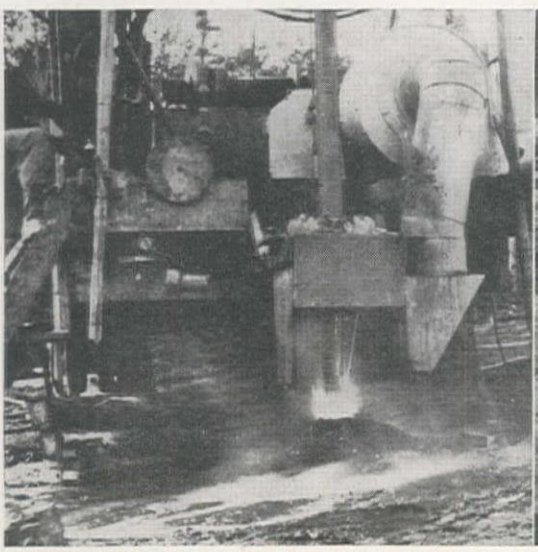
The new process, recently tested on the Mesabi Iron Range, uses a flame, produced by burning oxygen and a flux-bearing fuel in a special blowpipe, which is directed against the surface of the rock or ore. Some kinds of rock flake off or spall under the high flame temperature which is about 4,000 deg. F., while flux in the fuel causes other kinds of rock to melt. The pressure of the burning gases forces the molten material past a water spray where it is quenched and broken up. The water turns to steam, which, together with the gases, forces the quenched material out of the hole. Developed by the Linde Air Products Company, fusion piercing is a patented process.

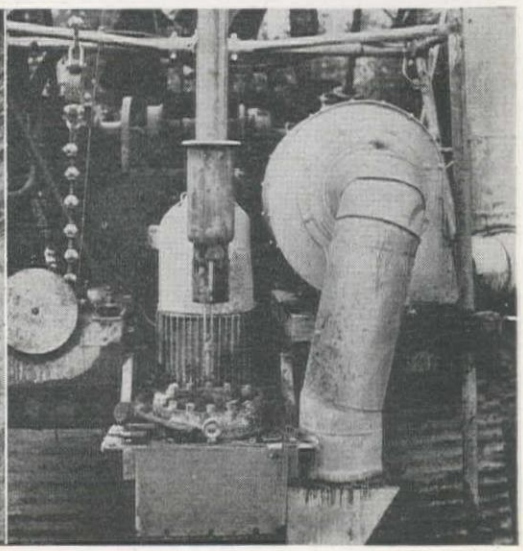
During the field tests a truck was equipped with a portable oil-field drill rig with the new 30-ft. special blowpipe replacing the "kelly" and pumps, motors, and special recording instruments.

Minnesota "taconite," an extremely hard, tough, abrasive, low-grade iron ore was the material used in the tests. Six-in. diameter holes up to 30 ft. deep were fusion pierced at an average rate of 10 ft. per hour, and for short periods 17 ft. per hour. Average speed of ordinary drilling is about 1 ft. per hour.

In addition to reducing costs of large-scale operations, the high-temperature piercing flame produces stresses in the surrounding ore which produces better fragmentation during primary blasting, thus still further reducing costs. Mining men who viewed the tests claim that fusion piercing will have many advantages in the mining of low-grade ore.

EXPERIMENTAL fusion-piercing rig set up on the Mesabi Range ready for a test run is shown in the picture above, left. Oxygen is supplied by the cylinders on the truck at left. Test run under way is shown above, right. The expelled granulated slag can be seen around the hole. The blowpipe is approaching a full depth pierce. The fusion-piercing blowpipe is shown coming out of the hole at the end of a test run, below, left. A 30-ft. blast hole six in. in diameter, typical of those produced by fusion-piercing is shown in the middle picture. Cut below, right, shows a view of the exhaust gas collector and the end of the piercing blowpipe.





NEWS OF WESTERN CONSTRUCTION

MAY, 1947

Engineers Complete Study of Davis Dam Foundation Work

THE BOARD of consulting engineers which has been considering foundation conditions at Davis Dam on the Colorado River has completed its deliberations, the Bureau of Reclamation announces.

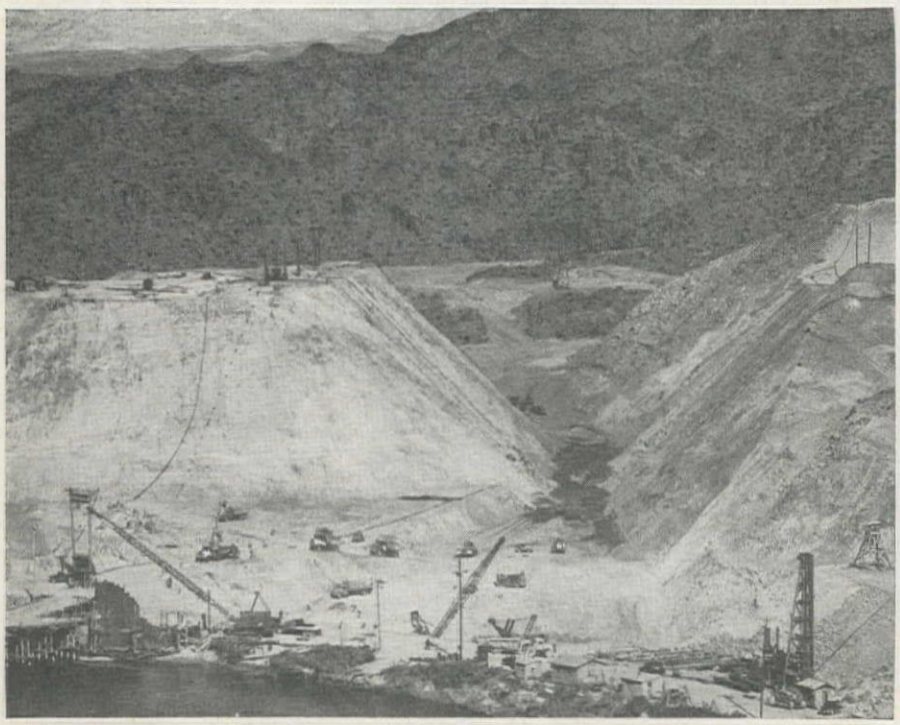
While the text of the board's report has not been made public, the results of its examinations are generally satisfactory.

Some changes will be required in the design of certain of the concrete structures and to make these changes may involve a few weeks' delay in getting some of this work started. The board's findings, however, have assured that conditions, while not everywhere ideal, are not beyond remedy and nothing like those depicted in wild rumors which have been in circulation during recent weeks.

The chairman of the board of engineers which has just completed its work was Joseph L. Burkholder, General Manager and Chief Engineer of the San Diego Water Authority. Burkholder was Chief Construction Engineer of the Metropolitan Water District of Southern California during the construction of the $200,000,000 Colorado River Aqueduct, including the difficult 13-mi. tunnel under Mount San Jacinto, and has been in charge of many other important construction projects.

Other members of the board were Ole Singstad, consulting engineer of New York City, internationally known authority on subway and subaqueous vehicular tunnels and other deep foundation problems; Dr. Charles P. Berkey, professor of geology at Columbia University, for many years consultant on dam foundations, tunnels and similar problems for the New York City Board of Water Supply on the Catskill and Delaware River Aqueducts, and for other public bodies; John A. Beemer, consulting engineer of Inglewood, Calif., who has a number of important and difficult dams and other heavy construction work to his credit; and J. W. Vanderwilt, consulting geologist for the Bureau of Reclamation, who has wide and varied experience in the study of dam foundations throughout the western states.

DAVIS DAM, showing excavation for diversion channel which takes off from the Colorado River just below Bullshead Rock. This channel has now been completed.



As to the 140-ft. high earth- and rock-fill dam itself, no question of change from original plan has been raised. The problems which were laid before the consulting board have to do with foundation conditions for the powerhouse, intake structure, and concrete spillway at the lower end of the forebay channel. After months of excavation work by the contractor, the foundations for these structures have now been exposed to view, some two hundred feet below the original elevation of the ground surface where the forebay channel cuts through the highest point of the Arizona abutment. As is usually the case where excavation operations of this magnitude are involved, the foundation conditions thus exposed, and as indicated by supplementary deep diamond drill borings, are different in some respects from those anticipated on the basis of the preliminary observations. In some respects they are better, in others poorer. No insuperable difficulties, however, are indicated.

The Bureau's chief engineer's office in Denver is already working on such revisions of the plans as are considered necessary, and some of the revised drawings will be in the contractor's hands within a few days. No important modifications will be required in the contractor's concrete mixing and placing plant which is already assembled, nor in his general plan of operations. A considerable reduction in construction forces had already taken place, due to the virtual completion of the heavy rock excavation work in March. The Bureau construction schedule, formulated more than a year ago, shows the present period as the low point in a three year construction program. With the completion of the excavation work there is a normal transition to the full program of concrete placement operations.

Problems of the type encountered at

Davis Dam are not unusual in the type and magnitude of the work being performed. They have in fact to a lesser or greater degree been encountered at Parker Dam as well as at Hoover Dam and other major construction projects. The construction work will go on at the present site even with some modifications in design as required to adapt certain of the structures to the foundation conditions encountered.

Surplus Equipment Creating Problem

SURPLUS CONSTRUCTION equipment sold and given away by the State Department, Foreign Liquidation Commissioner in foreign lands and insular possessions, or now arriving by the shipload in the nation's seaports, is creating serious impact on the construction equipment industry, states William A. Danner, president of the Associated Equipment Distributors, an association of approximately eight hundred distributors and two hundred and forty manufacturers of construction and road building machinery nation-wide.

Large inventories of scrapers, bulldozer attachments and related equipment are in long supply in manufacturer and distributor plants, but sales of huge quantities of these items are still being held by the War Assets Administration domestically and in United States territories and possessions.

These latter sales by WAA, on which import restrictions are not imposed by law or regulation, combined with similar properties given to foreign governments under long term credit agreements, which are being sold for dollars to American speculators, are glutting the market in this phase of the industry.

If not stopped at once, curtailment in new production is inevitable and personnel lay-offs in some plants will follow.

A recent order by the State Department, which removed import restrictions on many surplus items sold in foreign lands, plus the rapidity with which speculators have grasped this golden opportunity for quick profit, is primarily the reason for this demoralizing impact in certain products.

It was the intention of Congress when the Surplus Property Act was promulgated, and the Act so states, that surplus sold abroad should not be returned to the United States.

On the other hand, American business has concurred in the general viewpoint that surplus in critically short supply in this country **should** be returned for resale in the United States to fill urgent civilian needs. For example, cranes, shovels, tractors and motorized graders are in short supply at the present moment and current production schedules will not fill the demand for these products until late 1947 and early 1948.

However, based solely on the opinion of OWMR and CPA and without any consultation with industry to determine inventory and production schedules, the State Department opened the door to surplus imports right across the board.

This action constitutes a violation of the Act and must be stopped at once to prevent further irreparable dislocation of the domestic economy, according to Danner.

The AED will continue to fight, President Danner states, for the establishment of a sound business approach to the surplus disposal problem, for legislative changes which will enhance rather than jeopardize the nation's economy, insofar as surplus is concerned, to the end that American industry may return speedily and unhampered to peaceful and productive business pursuits.

Wyoming Project Urged For Early Construction

RECOMMENDATION for early authorization and construction of the $2,475,000 Star Valley reclamation project in Wyoming which comes under the Columbia river basin development program was made to governors of the basin states in a recent report.

Total cost of the project, which will irrigate 6,000 ac. of new land and provide supplemental water for 9,700 ac. now under irrigation, would include $154,000 which would be non-reimbursable to the government, according to Sen. J. C. O'Mahoney (D-Wyo). The water users would repay $1,244,000 out of the balance.

A plan to pool all revenues from all power projects in the seven-state basin has been proposed by the Bureau of Reclamation, whereby costs of particular projects, which cannot be paid out of reimbursement from the payment of water users, will be covered by the general returns from the whole basin.

The Star Valley project would be on the Salt River, a tributary of the Snake. The entire plan would include construction of a storage reservoir of 15,000-ac. ft. capacity on Stump Creek; the Crow Creek reservoir of 1,500 ac. ft., and the Elk Valley reservoir on Spring Creek with 3,000 ac. ft. capacity. Construction of 14 mi. of new canals would be necessary to bring the 6,000 ac. of new land under water.

The report reveals that construction of two dams between the backwater of Palisades reservoir and the town of Jackson, Wyo., would utilize the fall of the Snake river in that area to develop power. A dam 285 ft. high is proposed above Palisades about four miles upstream from the Idaho-Wyoming line. Known as Canon dam, it would create a reservoir of 262,000 ac. ft. capacity dead storage. A proposed power plant there would have an installed capacity of 70,000 kw., and annual production of 310 million kilowatt hours.

The other proposed dam would be known as Hoback dam and would be 275 ft. high. Built two miles downstream from the Hoback River, it would provide for a power plant of 40,000 kw. installed capacity and annual production of 180 million kw. hr.

Supplemental Report to Be Compiled By San Francisco Bay Crossing Board

THE JOINT Army-Navy Board originally formed by the Secretaries of War and Navy to consider the numerous proposals for a second crossing of San Francisco Bay held the first of a new series of meetings on April 15, 1947 to compile the supplemental report required by the Army and Navy Departments estimating the cost of including facilities for main line railroad trains on each of several proposed crossings of the San Francisco Bay.

The Board has been requested to submit specific information concerning:

1. The additional cost of the south crossing as recommended in the report of the Board issued on Jan. 25, 1947, (see *Western Construction News*, March 1947) viz., tunnel and trestle crossing to accommodate two lanes of railroad traffic.

2. Would the increased cost be impracticable from a financial point of view, and what would be the cost of a high level bridge to brir g railroad traffic into San Francisco?

3. What would it cost at this time to construct the crossings recommended by the Joint Army-Navy Board Report of November 18, 1941?

The second point refers to a high level span but is linked directly with the first one and would thus eliminate proposed bridge construction north of Army Street in San Francisco.

The rail cost study will cover the four probable southern crossings involved. These are: the low level combination causeway tube recommended by the present Board; a high level bridge from Army St. to the vicinity of Fifth St. in Alameda; a high level span between Bay Farm Island and Hunters Point; and the low level bridge between Bay Farm Island and the south side of Hunters Point. The last two crossings were reported on by the 1941 Board.

It is assumed that the rail lanes are being considered in addition to the six lanes of traffic recommended by the Board of 1946. At this time, estimates will be determined for the construction of a terminal in San Francisco, relocation of yards and passenger and freight facilities. Ventilation would be a problem where the tube construction is recommended, however this might be solved by electrifying the lines as was done by the Pennsylvania Railroad, under the Hudson River through the Holland Tunnel, between New Jersey and New York. A major point for consideration is the per cent of grade in the tube or on a high level span. A 3 to 3½ per cent grade is satisfactory for motor vehicles but the grade ordinarily considered desirable for trains is approximately 1 per cent.

The members of the board are at this

time Brigadier General Garrison H. Davidson, senior member; Colonel George Mayo, formerly district engineer for San Francisco, now retired; Colonel Edwin H. Marks, division engineer for the South Pacific, who will be retired very shortly; Commodore Lewis N. Moeller, superintending civil engineer, Western Sea Frontier; Captain James C. Baker, Moeller's associate; and Captain F. C. Fluegel, recently transferred to Newport, R. I. Col. Mayo and Col. Marks may remain on the Board. At least three months will be required for the board to complete its estimate.

Supersonic Equipment Is Constructed at Cal

THE WORLD'S FIRST supersonic laboratory equipment, duplicating actual conditions prevailing from 50,000 ft. to 100 mi. above the earth, is now under construction at the University of California at Berkeley, with funds provided by the Office of Naval Research. Announcement of the equipment construction was made jointly on Feb. 17, 1947 by Rear Admiral Donald B. Beary, USN, commandant of the Twelfth Naval District, and the University.

The equipment includes two supersonic wind tunnels: a pilot model good up to 70,000 ft. in which speeds three times the velocity of sound can be simulated; and a larger tunnel, 3 inches square, which will duplicate conditions up to 50 mi. and simulate speeds over five times the velocity of sound. The small tunnel is scheduled for completion in about a month, the large one, some time this year.

To cover the range from 50 to 100 mi., a molecular beam apparatus, the design of which has yet to be determined, will be constructed. In this technique a model will be placed in a high vacuum simulating the low pressures of extremely high altitudes; a molecular beam, produced by heating air or other gases to high temperatures, will be hurled into the vacuum against the model.

The wind tunnel, based on war-developed vacuum and jet propulsion principles, will make possible the first practical exploration of a wide belt of atmosphere which has been a scientific no-man's land.

The size of the test chamber of the pilot model will measure 1 inch by ⅜ of an inch, while the full scale model will be about 3 inches square. This size is considered adequate for the development of needed information. Although larger tunnels of this type may be built later, the power requirements are so huge as to be almost prohibitive.

The new apparatus and other high vacuum equipment which may simulate the low pressure of extremely high altitude, will permit a study of characteristics of the upper atmosphere but not supersonic speeds at those heights. With information on supersonic speeds below 50 mi. and on the atmosphere above 50 mi., it will be possible to make reasonably accurate calculations of supersonic phenomena at the higher altitudes.

Bond Issue for Aqueduct Additions To Be Considered by San Francisco

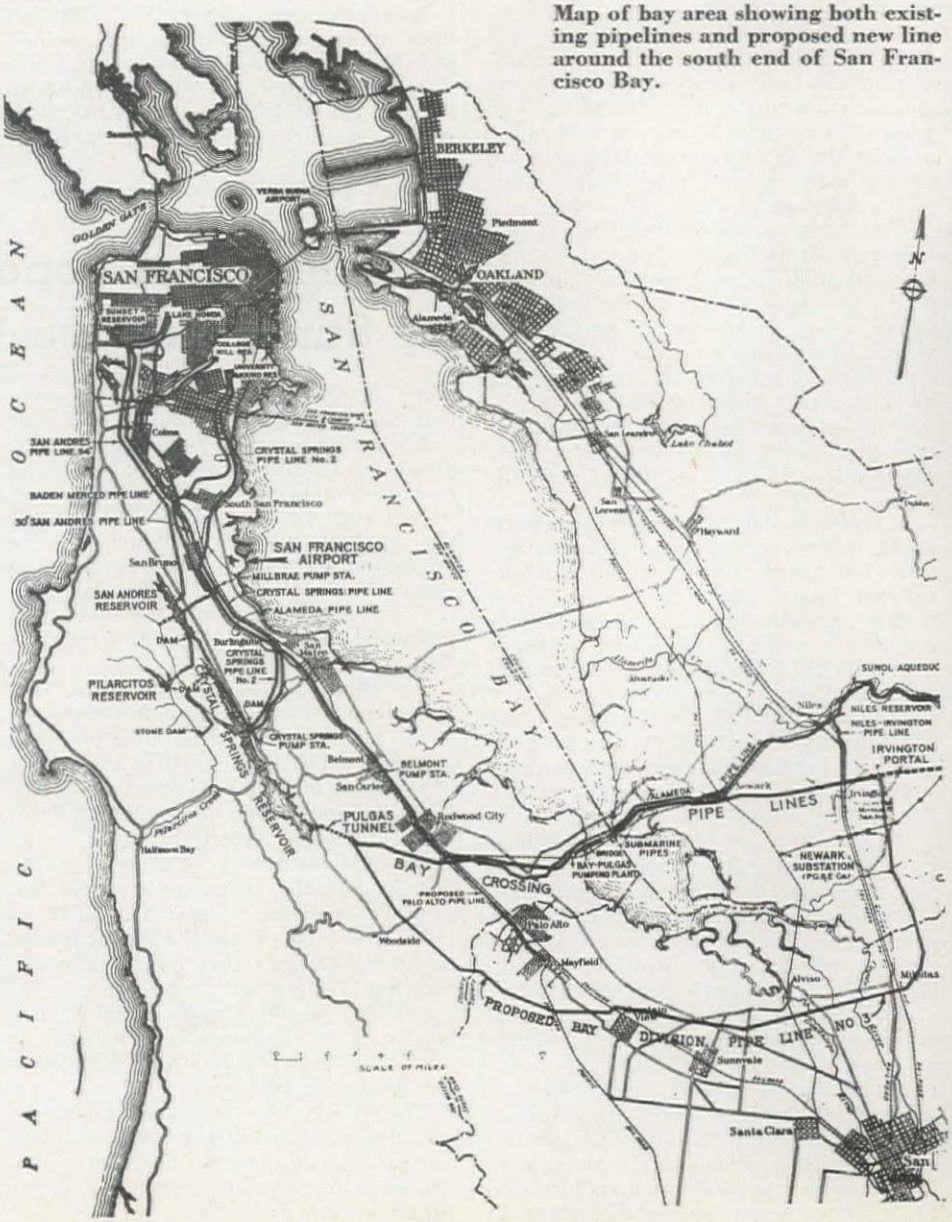
PROPOSED ADDITIONS to Hetch Hetchy aqueduct delivery lines which would nearly double present maximum water delivery are up for consideration under the contemplated $25,000,000 bond issue for the San Francisco Water Department.

A second San Joaquin Valley pipeline carrying water from O'Shaughnessy dam will parallel the present pipeline along a portion of present 47-mi. stretch from Oakdale to Tesla Portal on the east side of the Coast Range Mountains and will entail an expenditure of $12,750,000. The present valley line carries only 60 million gallons per day, whereas other suggested transmission facilities above and below the Valley line are capable of transmitting 200 million gallons a day. The initial portion of the new line will insure delivery of a total of 75 m.g.d., and the completed pipeline will jump present delivery over 100 per cent.

The remaining $12,250,000 in bonds are to be spent to build another connection between the east bay and the peninsula, consisting of a 22-mi. pipe from a point near Niles, around the south end of the bay to the Crystal Springs Reservoir. All pipe will be of 72-in. diameter or its equivalent and will boost delivery of water by 76 m.g.d. The present connection, with a capacity of 112 m.g.d., crosses the bay at Dumbarton Strait.

Need for additional pipelines to the city of San Francisco is shown by the fact that present daily consumption is over 100 m.g.d. with a peak as high as 131 m.g.d., while present maximum delivery from all sources is 116 m.g.d. Consumption rate, increasing steadily, by 1950 is estimated to reach 118 m.g.d. The new proposed constructions would insure delivery of 200 m.g.d.

Map of bay area showing both existing pipelines and proposed new line around the south end of San Francisco Bay.



WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—The best guessers here late in April are convinced that most of the cuts in the Reclamation Bureau budget will remain, despite the efforts of Sen. McCarran, and the very hard work put forth by Congressmen John Phillips, Calif.; Walt Horan and Hal Holmes, Wash.; William Hill, Colo.; and Frank Barrett, Wyo. It is believed by those best informed that the only concessions the leadership has made is to agree to add $3,000,000 to be spent in planning; and from $5,000,000 to $7,500,000 to be spread among the Columbia River, Central Valley, and Colorado-Big Thompson projects—possibly something for the Missouri Valley, also. The word is that the Columbia River project will get the bulk of the construction funds that may be added. It is understood that funds for the ground water investigations by the Geological Survey will be restored in the Interior appropriations. The Geological Survey Budget was cut by the Committee from $18,104,900 to $9,113,230, which would have utterly wiped out ground water studies, studies, according to Sec. Krug, that have been in progress for 50 years.

The politics of power

It also is understood to have been agreed that the new Rockwell bills, H.R. 2873 and 2874, substitutes for H.R. 1886, will be reported out of Committee substantially as written. The new formula will wipe out the Reclamation Bureau policies which are based on the Solicitor's opinion, and not upon the law as Congress thinks it meant it to be. H.R. 2873 will prevent interest charges on the investment for power in Reclamation projects from being applied against the principal; also, it will reduce the interest rate from 3% to 2%, but is designed to secure full repayment of power construction costs on a project within 67 years. It will be made crystal clear that funds go into the Treasury, and that Congress will henceforth make the policies, not the Bureau of Reclamation. The new program will apply to Federal power rates in future projects, and will not affect present rates, which should reassure the people in the Bonneville-Grand Coulee area.

The politics involved were complicated. Apparently Sec. Krug, Mike Straus, and others, were betting on the probability that the urgent power needs of the Pacific Northwest would raise so much uproar, without regard to party lines, that the bipartisan political pressures would force modification of the appropriation cuts despite the avowed hostility of many members of Congress to Straus, Paul Raver, Krug, and the ultra-liberals in the Interior Department. Therefore, Straus and his colleagues stood pat in refusing to make any concessions on the Rockwell bill; in other words, they insisted that their interpretation of the law, as defined by a tame Solicitor, was the real meaning of the law, no matter what Congress itself said about its own intent in making the law. In a sense, this was an effort to have your cake and eat it, too. They expected to get the funds Congress said they could not have unless they complied with the law, and they intended to comply with the law **as they construed compliance.**

The Straus crowd apparently calculated that they had no real reason to worry about the Rockwell bill, or any similar legislation. They could always depend upon the White House to veto any Act that would threaten their policies. At the same time they felt certain the Republicans would not have the courage to decline the appeals of the Pacific Northwest, and the rest of the West, for restoration of the cuts in the budget.

It remains to be seen to what extent they called the wrong cards. It is clear that the high Republican command in both the Senate and the House are so utterly out of sympathy with Straus and what his administration stands for, that they will stick to the program of cutting appropriations to the bone until there is some shifting of top-bracket administrative personnel, such as Straus, Raver, and their followers.

Obviously the appropriation reduction policy is consistent with the over-all policy of bringing the fiscal operations of the Federal Government nationally within bounds; the Congressional policy, therefore, in the largest sense, wins votes; and the word here is that it has the fundamental support of the larger part of the West, even those who are temporarily jeopardized by irrigation, reclamation, and power project appropriation cuts.

This feeling in the West apparently crystallized in the attitude of the responsible representatives of the National Reclamation Association, who made clear that the most pressing and paramount need at this time was to support Congress in its policies as revealed in the Congressional opposition to the Reclamation Bureau's irrigation and power policy. It should also be noted that wherever the heads of important power projects have refused to cooperate, (Raver, for instance), the project funds have been amputated. It likewise may be noticed that the Power Division of the Interior Department—beloved by the radicals—was wiped out completely by the terms of the Interior appropriation bill.

On the other hand, Douglas Wright, head of the Southwestern Power Administration, not only was courteous to the Congressional Committee, but helped it to find places where it could make reductions. Notably, he cooperated in excising $4,000,000, which he had requested to enable the Southwestern Power Administration to buy an Arkansas-Louisiana transmission line. Incidentally, Wright and his Southwestern Power Administration comes out of the debacle with a very substantial appropriation, amounting to $1,371,000, practically all Wright wanted except for the transmission line.

Construction appropriations

The Reclamation Bureau was budgeted for $145,952,200 new funds; the Committee cut away $83,234,600, leaving $62,717,600 new funds. It pointed out, however, that the money left over from the Presidential freeze order will enable the Bureau to operate with a total of $141,085,367 next year — from July, 1947 to June 30, 1948. The Bonneville Power Administration—the Raver empire—was cut $13,370,200, reducing its budget requirements, (as approved by the President), from $20,278,000 to $6,907,800. Late in April men here like Christy Thomas of the Seattle Chamber, who have been fighting for adjustments, were hopeful that the total finally available will be $13,000,000. As originally reported, the cut for Bonneville exceeded 74%; the Grand Coulee-Snohomish transmission line was reduced from $6,000,000 to $1,000,000; Columbia substation additions were wiped out, as was the McNary-LaGrande transmission line; new construction allowances were cut to $1,021,000, affecting southwestern Oregon, eastern Washington and Idaho. Operation and maintenance was cut $2,000,000.

The final word will not be said until the Interior Appropriation Bill is formulated in the joint House-Senate conference. This will come after the House bill has been debated on the floor of the House, and after the bill reported on the floor of the Senate has been discussed in that Chamber. The Senate bill is the hope of the Interior Department. There is little doubt, however, that the conferees, who will draft the final version, will be in sympathy with the general objective of cutting the Bureau of Reclamation down to size as a subordinate part of Government. The chief fight is against the Bureau. On the Hill, the members of Congress regard it presently as chiefly a great and skilled propaganda and proselyting instrument rather than as a technical organization of engineers and trained experts whose main job is to build dams and establish irrigation projects. They will tell you that the Bureau needs the leadership of a great engineer, consistent with the character of those who have headed it in the past.

The report that Davis Dam construction work has been halted, was not helpful. At this writing the members of the Senate and the House are waiting for the report of a consulting board, which report is said to be reposing upon the desk of the Chief Engineer of the Bureau of Reclamation. The members of Congress were told that the interruption is due to the discovery of a condition that did not show up in the core drillings, i.e., the presence of shifting clay strata in the

rock crevices, ranging from an inch to considerably more than an inch in thickness. Apparently the condition is worst under the spillway, and will require changes in the plans for the construction of the powerhouse as well as the spillway, and the concrete intake.

The investigating board is reported to have recommended three methods of adjusting the trouble. All are said to be very expensive. One report has it that it will be a very troublesome grouting job. The lowest estimate of expense, according to reports on the Hill, well exceeds $1,000,000. The members of Congress have not yet been able to determine whether or not the dam itself is affected. No statement has been made by the Bureau of Reclamation. It is not unlikely that Congress itself may make an official inquiry, after the report of the Board of Engineers is received.

Hearings were still in progress in the House Committee to determine the flood control and Rivers and Harbors appropriations to be allocated for use of the Corps of Engineers during the coming fiscal year. It is expected the budget of $290,000,000 will be cut between 40% and 50%, with no allowances for new projects.

Power Commission

The Federal Power Commission is in the news here because Vice-chairman Richard Sachse of California has sought to resign but has had difficulty in persuading the Commission to act. The internal fight in the Capital is over the influence that shall determine the identity of Sachse's successor. FPC Chairman Nelson Lee Smith has a candidate, and Ed Pauley is reported to have others. Those mentioned are Will Rogers, Jr.; ex-Senator Hugh Mitchell; Burton N. Behling, and Charles W. Smith, the latter both FPC officials. Pauley's influence at the White House is very strong.

The Commission also is under fire for its leanings toward nationalization, according to testimony before the House Interstate Commerce Committee. The witnesses were Gov. Frank Carlson of Kansas, Col. Ernest O. Thompson, chairman of the Texas Railroad Commission, and Rep. Ross Rizley of Oklahoma. The witnesses asked the Congress to restrict the Commission's regulatory authority over utilities, which encroaches upon States' rights. The amendments to the law particularly concern producers and gatherers of gas who sell to interstate companies, and other utilities which are in essence local but find themselves in a similar situation. The bills under special consideration are H. R. 2185, to amend the Natural Gas Act, and H.R. 2972 and 2973, to amend the Federal Power Act.

H.R. 2973 would modify the hydroelectric section of the Power Act. It would forbid FPC control over any hydro project built and operated before passage of the old Federal Water Power Act in 1920; it would exempt manufacturers and other non-utility hydroelectric operators from FPC control, and confine the control to hydro projects developing power for sale in interstate commerce; it would permit FPC control over projects on non-navigable streams only if they adversely affect navigable streams, and only if built since 1935; the potential law would nullify the Supreme Court decision in the New River case by defining a navigable stream as one ordinarily used for commercial navigation, or one which could be converted to such use at reasonable expense in relation to the commerce expected. At present it is often said the New River case virtually turns a rainbarrel into a navigable stream.

H.R. 2973 would protect States' rights, or State commission jurisdiction, from FPC encroachment, by amending the interstate commerce section of the Power Act. It would stop FPC from controlling state-line delivery of wholesale power for resale, or from taking jurisdiction over companies having emergency or "slop-over" intercompany connections. It would nullify the Supreme Court decisions in the Hartford case, the Jersey Central case, and similar rulings. There is little hope the bills will be passed in this session. Even if they were enacted by the Congress it is considered likely they would be vetoed by the President. There is widespread desire both in the House and the Senate for such legislation, and it is assumed the hearings and the discussions will pave the way for the enactment of the bills in 1948.

Anti-monopoly

Another anti-Federal-power monopoly bill is H.R. 3036, introduced by Rep. Dondero, Michigan, which would deprive Interior Department from operating, constructing, or marketing authority over power production at flood control dams; the authority would be vested in the Secretary of War. Federal construction of transmission lines duplicating existing facilities would be banned; erection of any transmission lines from Federal projects would be entirely under control of Congress. FPC would have jurisdiction over Federal power rates. Regional rates would be permitted. The proposed law would not affect TVA or Bonneville. The object of the law would be to eliminate unfair Government competition, and would enable power companies to have a part in developing river basins, and to sell greater volumes of power at lower rates. Under certain circumstances power sale preference would go to cooperatives and public bodies. The bill will have early consideration, but again is expected to be almost certain to meet with a Presidential veto.

The Dondero bill, together with the Thomas bill, discussed in these columns last month, and the Dirksen bill, as well as the Miller bills, reveal that a systematic and vigorous effort is in progress to arrest the nationalization and socialization programs launched the past years by the various Federal Departments. These programs, which include the nine regional plans, all stemmed virtually from Interior, apparently the joint job of the Power Division and the Straus Reclamation group. This nationalization emphasis is one of the major reasons for the reluctance of the Congressional Appropriation Committees to give the Interior groups any leeway with funds.

Hearings on S. 912, to exempt water projects in Colorado, Texas, and California, from the 160-ac. land-limitation law, and similar laws, will come up for a full dress hearing before the Senate Public Lands Committee in May.

Miscellaneous items

As soon as materials become available, considered reasonably imminent, it is expected there will be a large increase in highway construction. Costs soon are expected to shrink about 15%. Congress enacted a law which validates expenditure of unexpended balances for postwar road balances provided in the Federal Highway Act of 1944. This makes available during the next fiscal year approximately $200,000,000 which otherwise would have reverted to the Treasury. S. 800, introduced by Senators Morse, Cordon and Johnson (of Colorado), would supply $25,000,000 to build roads accessible to standing timber lands owned or controlled by an agency of Government.

President Truman plans a trip to California late this summer. While all the West Coast will be visited, especial attention will be devoted to California, apparently with 1948 in mind. The President also will visit Alaska. . . . The Senate finally approved the shift from the name Boulder Dam to Hoover Dam, after vigorous opposition from Sen. McCarran, and wisecracking opposition from Sen. Taylor of Idaho. The House has no opposition to the change, but thinks the name already is legally fixed as Hoover Dam.

Harrie O. Bohlke, representing the City of Seattle, appeared before the House Public Lands Committee and vigorously championed statehood for Alaska. There is some likelihood that the movement may be successful. The White House favors statehood for the Territory. Mining, fishing, and transportation industries are reported to be opposed. . . . Exemptions and exceptions from provisions of the Walsh-Healey Act, permitted during the war, have been revoked by Secretary of Labor Schwellenbach. The order virtually completes removal of all special Walsh-Healey public contracts exemptions. The order does not apply to contracts solicited or under negotiation before April 9, 1947. . . . Higher freight rates are predicted by those in the ICC know, this Fall.

The House Armed Services Committee approved legislation to establish a naval postgraduate school at Monterey, Calif., to be located on Del Monte Hotel property, at an initial cost of $2,600,000. Over 500 officers will be ordered there almost immediately. Sites in Florida and in Maryland were declined.

After approval by manufacturers of cable, it was announced that electric power will be brought to the British Islands from Norway by submarine cable. The move is regarded as an escape from a very critical dilemma created by electrical energy shortage in the British Isles.

FPC Hears Gas Company Applications in Denver

THE FEDERAL Power Commission is holding hearings at Denver, Colo., on applications filed by Colorado Interstate Gas Co. and Colorado-Wyoming Gas Co. requesting authority to construct and operate additional natural gas pipeline facilities.

The application of Colorado Interstate, originally filed in conjunction with Canadian River Gas Co., has now been amended to eliminate the latter company and make certain changes in the facilities to be constructed by Colorado Interstate. The amended application requests authorization to construct and operate approximately 240 mi. of 20-in. natural gas pipeline from the vicinity of Denver to a proposed compressor station near Lakin, Kans. Cost of the facilities has been estimated at about $12,000,000.

Colorado-Wyoming Gas Co. has asked permission to construct 105 mi. of 8 and 10-in. natural gas pipeline extending from a point of connection to be made with Colorado Interstate's proposed Denver line to Cheyenne, Wyo., and a 1,200 hp. compressor station to be located about 8 mi. east of Denver. Cost has been estimated at $1,415,000. The proposed construction is contingent upon FPC authorization of Colorado-Interstate's proposed new line to Denver.

Colorado Interstate operates natural gas pipeline facilities in New Mexico and Colorado and sells and delivers gas for resale in these states and Wyoming. Its offices are in Colorado Springs.

Colorado-Wyoming operates natural gas pipeline facilities in Colorado and Wyoming and sells and delivers gas for resale in these states. Its offices are in Denver.

Portland Organization Offers Unique Service

A UNIQUE new service is to be available to the chemical and other industries of the United States through the formation of the Raw Materials Survey at Portland, Ore. This survey has been incorporated as a non-profit organization supported by Chambers of Commerce, banks, public utilities, steamship and railroad lines, and Port authorities in Oregon and southern Washington.

The purpose of the Survey is to collect basic factual engineering and economic data on sources of raw materials needed by present and potential industries of the area. It is not primarily concerned with local raw materials, but its aim is to show where adequate supplies of proper raw materials — mineral or chemical — may be obtained.

The permanent chairman of the Operating Committee is Brig. Gen. Thomas M. Robins, Retired, formerly Deputy Chief of the U. S. Engineers in Washington, D. C., now engaged in private consulting practice in Portland. The Managing Engineer is Richard J. Anderson, formerly Resident Geologist of the Alcoa Mining Co., at Portland.

Special studies on most important problems will be made for the Survey by independent consulting engineers. This project is the outgrowth of similar work inaugurated in 1946 by the Industries Committee of the Portland Chamber of Commerce.

Permanent headquarters of the Survey will be located in the Woodlark Bldg., in Portland.

OBITUARIES . . .

George H. Weller, 68, retired paving contractor of Spokane, died in that city on March 2. Mr. Weller's organization was responsible for paving many of the principal thoroughfares of Spokane including north Division, Northwest Boulevard, and Wellesley. Since his retirement the firm has been directed by two sons, Robert J. and Walter C.

* * *

Harry Thompson, 71, retired civil engineer of Edmunds, Wash., died last month. A veteran of World War I through which he served as a captain in the 6th Engineers, he had served in the office of the King County engineer until his retirement 7 yr. ago.

* * *

George MacLeod, 60, assistant district engineer, provincial public works department, New Westminster, B. C., died suddenly at his home there recently. MacLeod was born in Scotland and came to Canada prior to World War I. After practicing his profession in the east, he was engaged in the building of the Grand Trunk Railway in western Canada. In 1924 he was appointed resident engineer for the public works department at Yale, B. C. From 1929 to 1938 he was stationed at New Westminster and from 1938 until 1943 was assistant district engineer at Salmon Arm. In July of 1946 he was placed in charge of the south side of the Fraser Valley, with headquarters in New Westminster.

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Erle Montgomery Craig, founder and president of E. M. Craig Co., Ltd., Vancouver, B. C., died recently in Pasadena, Calif. Craig entered the residential construction business in 1920, shortly after he came to Vancouver to establish a small sawmill. His business will be taken over by a son, Douglas.

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Joseph M. Grantham, 60, foreman of the Seattle lighting department meter division since 1910, died in Seattle on March 16. Prior to joining the lighting department staff he had been employed in the city engineer's office in Seattle for several years.

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William Berry, an employee of Macco Construction Co, was killed April 18 while operating a shovel at the Macco-Morrison-Knudsen quarry supplying the fill material for the San Francisco Municipal Airport.

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Arthur E. Williams, an associate engineer for the Colorado State Land Board, died in Denver on April 2 after a brief illness.

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Isaac Deeb, formerly an engineer in the Seattle city engineer's office, died in Seattle on March 8.

IDAHO POWER COMPANY HAGERMAN PLANT READY TO GENERATE SOON

CLOSE UP air view of the powerhouse structure at the Idaho Power Company's 16,500-k.w. project on the Snake River at Upper Salmon Falls near Hagerman, Ida., which was described in an article in the May, 1946, issue of *Western Construction News*. The 2000-ft. concrete-lined canal is 18 ft. deep and 72 ft. wide at the surface, can carry 6,500 cu. ft. of water per sec. Intake from diversion dam is upstream, left.

Contracts for Transmission Lines, Other Equipment, Granted by Bureau

CONSTRUCTION of two transmission lines and purchase of poles and conductor wire for a third, have been ordered by the Bureau of Reclamation in three contracts.

The two transmission lines to be constructed are the Brush-Sterling 115,000-volt line, and the Sterling-Holyoke 69,000-volt line on the Bureau's Colorado-Big Thompson project in Colorado. The poles and conductor wire are for the Gering-Sidney transmission line on the Missouri Basin project.

The Brush-Sterling line will be approximately 37 mi. long, from a tap near Brush, Colo., to a substation near Sterling, Colo. The Sterling-Holyoke line will be approximately 48 mi. long, from the Sterling substation to a substation near Holyoke, Colo. Aluminum conductor wire will be used for both lines which will be of three-phase, single-circuit type, and of wood pole construction.

The Colorado-Big Thompson project on which the transmission lines will be built will provide a supplemental supply of water for approximately 615,000 ac. of land now under cultivation, but suffering from periodic dry seasons. A power system on the project will provide a hydroelectric generating capacity of about 176,000 kw. for irrigation pumping, and will provide power for REA cooperatives, municipalities, and other demands.

The contract for the two lines was awarded to the Utilities Construction Co., Nashville, Tenn., on its combination bid of $458,011. Both lines must be completed within 10 months.

The Gering-Sidney transmission line on the Missouri Basin project in Nebraska will be approximately 80 mi. long. A contract calling for 1,600 poles and 1,650 crossarms for the line was awarded to J. H. Baxter and Co., San Francisco, on its bid resulting in a net cost of $124,827. Another contract for 249 mi. of conductor wire and fittings for the line was awarded to the Aluminum Company of America, Washington, D. C., on its bid resulting in a cost which will not exceed $193,937. The line will carry power from the existing plant at Gering to supply REA cooperatives and municipalities in western Nebraska.

Foreign Engineers See U. S. Highway Techniques

OPPORTUNITIES to study modern techniques in highway design and construction, as practiced in the United States, were extended by the Public Roads Administration during the past year to 183 engineers from 34 foreign countries.

The delegations of visiting engineers came to this country under the auspices of the State Department, the Institute of Inter-American Affairs, the Office of the Indian Agency General, and other agencies with whom Public Roads cooperated.

The length of time the various groups spent in the United States varied from a few weeks to three months or longer. A few individual engineers, interested in particular phases of highway development, remained nearly a year. State highway departments gave important assistance in placing foreign engineers on construction jobs.

The largest number of visiting engineers came from Brazil, which sent a delegation of 11 civilian engineers and another group of 15 Army engineers. India sent 22 engineers who remained in this country approximately 3½ months. Thirteen engineers came from China, and 10 from Russia.

Other countries represented by smaller groups included Argentina, Bolivia, Colombia, Peru, Chile, Ecuador, Uruguay, Venezuela, Panama, Costa Rica, El Salvador, Guatemala, Mexico and Cuba; England, France, Holland, Switzerland, Norway, Sweden, Denmark, Poland, Czechoslovakia and Spain; Iraq, Egypt, South Africa, Australia, New Zealand and Canada.

Lightweight Aluminum Used In Reroofing Mormon Temple

A NEW LIGHT WEIGHT aluminum roof is in store for the world-famous Mormon Tabernacle in Salt Lake City, Utah, but more than five tons of tar and patching are to be removed before the new roof can be placed, according to Jed L. Ashton, contractor for the job.

Weight of the aluminum, which was measured, cut, ribbed and tapered at the Overly Manufacturing Co. factory before being shipped to the Temple grounds, has been estimated at about 30,000 lb., which is tons lighter than the original roofing used. Special felt paper is being laid as a moisture repellent and more insulation may be used between the original fir sheeting, still in excellent condition, and the aluminum.

Cost of the new metal roof has been estimated at about $60,000. Work is expected to take approximately nine weeks.

100-mi. Turnpike in Oklahoma

A PROPOSED $30,000,000 "airline" toll highway 100 miles long between Oklahoma City and Tulsa was under discussion recently by civic leaders in Oklahoma's two largest cities.

The hundred mile turnpike, which would be straight with no curves or corners and would miss towns between the two cities, would be financed by private enterprise and liquidated by the toll fees. Four lanes wide with a landscaped center separating traffic going in opposite directions, the toll fee for the highway would be set at one cent per mile, or $1 for a through trip either way.

Plans Approved for Construction of Multi-Million Dollar Denver Highway

DENVER'S multi-million-dollar Platte River Valley highway is about to become a reality, with recent approval of final plans for the start of construction by the Public Roads Administration. Plans for the super highway appeared in *Western Construction News* in the June, 1945 issue.

Construction on the project is expected to start in the early summer, and calls for building of a portion of tne highway from West Forty-eighth Ave. and Acoma St. to the Twentieth St. viaduct at an estimated cost of $2,225,000.

According to Alfred J. Ryan, co-partner in the consulting engineering firm of Crocker & Ryan, engaged by the state highway department to prepare specifications for the first five and one-half miles of the 9-mi. highway, contracts will be ready by May 15. The first contracts will cover erection of elevated structures for overpasses and bridges along the route. Other contracts, calling for grading, surfacing and paving, will follow in order that work on the highway proper may be started in early summer.

Six large interchanges in the thoroughfare will provide smooth flow of traffic on and off the Valley superhighway. They include modified "cloverleaf" structures at West Forty-eighth Ave. near Broadway and West Thirty-eighth Ave. and Fox St., a ramp type between Eighteenth and Nineteenth Sts. near Central St., a "cloverleaf" at the north end of the Fourteenth St. viaduct, a ramp type at West Twenty-third Ave. and Water St., and a modified "cloverleaf" near Second St. below the juncture of the West Colfax Ave. and Larimer St. viaducts.

Alaskan Waters to Be Surveyed by U. S. Ship

THE U. S. Coast and Geodetic Survey vessel, the "Pioneer," commanded by Capt. F. S. Borden, a veteran of 35 years in the service, and equipped with a crew of 104 and the latest of war developed electronic devices, has left the Port of Oakland, Calif., to carry out survey work in the still uncharted waters between Kiska and Attu in the Aleutian chain.

Basing on Massacre Bay, on the southern side of Attu, the easternmost island in the Aleutian chain, the vessel will work a 120-mi. stretch of water from the eastern end of Attu to Kiska Island, plotting in detail the ocean bottom north and south of the Aleutian Ridge

and studying the erratic currents and tides, a job which has never been done before in that area.

Before the war, the importance of the Aleutian waters was ignored, but after the Japanese moved in U. S. ships had to sail practically under their noses to make hasty charts for the operations of the fleet to dislodge the enemy.

In its work the vessel will utilize "shoran," developed by the Army during the war to bomb targets hidden from the planes by fog or clouds. A special assignment will be to chart the "Aleutian Trench," which exists on the southern side of the ridge which forms the Aleutian chain. The underwater mountains drop suddenly to depths of perhaps 2,500 ft., and a cave-in on the sides of this "trench" is believed to be the cause of earthquakes and tidal waves, such as the one which struck Hawaii recently.

The "Pioneer" will operate jointly with another Coast and Geodetic Survey vessel, the "Explorer," which recently left Seattle.

NEW BOOKS...

CONCISE CHEMICAL AND TECHNICAL DICTIONARY—edited by H. Bennett. Published by the Chemical Publishing Co., Inc., 243 King St., Brooklyn 31, N. Y. 1055 pages, 6 x 9. Price $10.00.

Technical terms on engineering, chemistry, metallurgy, pharmacy, and plastics, as well as others, are included in the nearly 50,000 definitions found in this dictionary. Although it covers every field of scientific and technical development, laymen as well as professionals will find it useful. Many cross-references are included in the book, plus a great many internationally accepted terms which facilitate mutual understanding between the scientist and technical worker of many countries.

The book, whose nomenclature is that generally adopted by engineers and chemists, includes an up-to-date compilation of trade-name or proprietary products in the synthetic resin, plastics, metal, and rubber fields, including emulsifying and wetting agents, plasticisers, detergents, etc. Definitions are clear, concise, and to the point.

SEWERAGE AND SEWAGE TREATMENT—by Harold E. Babbitt, professor of Sanitary Engineering, University of Illinois. Member A.S.C.E. Sixth edition, published by John Wiley and Sons, Inc., New York; Chapman & Hall, Ltd., London. 692 pages, 5½ x 8½. Price $6.50.

This sixth edition deals with latest post-war projects as well as those covered in the earlier editions. Originally a development of notes used in the author's classroom lectures, it is a factual study of current practices in sewerage and sewage treatment. It stresses design problems, treatment methods, and plant operations. Material concerning high-rate filters and contact aerators has been added to the original text. The discussions of hydraulics and the rational method of determining runoff have also been rewritten.

PANEL HEATING AND COOLING ANALYSIS, by B. F. Raber and F. W. Hutchinson. Published by John Wiley & Sons, Inc., New York City. 208 pages, 5½ x 8½. Price $3.50.

This book may be divided into three separate sections, all of which will be of interest to the specialist, but each of which will be of a special interest to a particular type of reader. The first section, Chapters I through IV, is composed of non-technical, descriptive material on the background, development, advantages, disadvantages, and types of installations of panel heating and cooling systems. The second section, Chapters V through XI, composes the body of the book, and is intended as a textbook for senior and graduate engineering students, and as reference for design engineers and research workers. It presents a detailed treatment of the theory of radiant exchange and the mathematical analysis of radiant panel heating and cooling systems. The final section, Chapters XII and XIII, presents simplifications of the national design procedure and discusses their degree of approximation. This third section is designed to be of special interest to the heating and air-conditioning contractor, the architect, and the design engineer.

PERSONALLY SPEAKING

Colonel Jack Singleton, Chief Engineer, American Institute of Steel Construction, Inc., with headquarters in New York, recently paid a visit to San Francisco where he conferred with members of the architectural and engineering professions. He spoke before a joint meeting of the Sacramento Section, American Society of Civil Engineers and the newly formed Structural Engineers Association of Central California. His topic was "Recent Developments in Structural Engineering Design." Colonel Singleton predicted many improvements in fabricated structural steel in both design and construction which will be of material help to engineers and contractors.

Appointment of **George E. Solnar, Jr.,** as manager of association activities promoting the sale of common and face brick for residential and commercial purposes was announced recently by the board of directors of the newly organized Clay Brick Manufacturers' Association of Northern California, at San Francisco. The association hopes to render service to architects, engineers, contractors, builders, and others interested in the use of common face brick. Solnar was formerly engineer in charge of studies in analytical mechanics for a Joshua Hendy Iron Works engineering development project.

Edwin H. Smith of San Mateo, Calif., was recently elected president of the organization for 1947, succeeding **E. Elmore Hutchison** of San Francisco. Other officers elected include **Jack Y. Long,** Oakland, first vice-president; **James E. Waite,** San Francisco, second vice-president; **C. C. Young,** Oakland, secretary, and **E. Elmore Hutchison,** San Francisco, treasurer. Association members named to the board of directors are the officers and **Theodore V. Tronoff,** of East Bay Chapter; **Wm. Soule, Edwin H. Smith** and **Horton Whipple** of San Mateo Chapter, and **John C. Oglesby** of San Francisco Chapter.

Dr. Stephen P. Timoshenko, professor emeritus of theoretical and applied mechanics at Stanford University, is in London to deliver a series of lectures under the auspices of the Institution of Mechanical Engineers. Following the London lectures, Dr. Timoshenko will travel to France and Switzerland and probably to Germany. In these countries he expects to consult with fellow scientists on progress in the field of theoretical and applied mechanics, in which he is an acknowledged world authority. He is the author of numerous technical books and scientific articles. Dr. Timoshenko is expected to return to Stanford late in the summer.

Charles K. Weidnar, superintendent of the physical plant of the University of Oregon at Eugene, has been appointed as superintendent of parks for the city of Seattle. He will assume his new position on Aug. 1. A graduate in civil engineering from Williamson College, Penna., Weidner served with eastern construction firms, the Northern Pacific railroad, and the Boeing Aircraft Co. until 1934 when he became resident engineer and instructor in physics at Whitman College in Walla Walla, Wash. For 5 yr. prior to the war he served as assistant superintendent of buildings and grounds at the University of Washington, and during the war served with the Civil Engineer Corps of the Navy, being released with the rank of captain.

The Grays Harbor (Washington) Technical Engineers and Architects recently announced the election of **Richard Rowland** of Cosmopolis, Wash., who succeeds **E. F. Emmick** of Hoquiam as president of the organization. Other officers are **Frank Haaga,** Hoquiam, vice-president; and **Kenneth Horton,** Hoquiam, who was re-elected secretary-treasurer. **Perry C. Briggs** and **Charles C. Kirkwood** were designated as delegate and alternate, respectively, to the Central Labor Council.

A. N. Baker, former safety supervisor for the Santa Fe Railway at Fresno, Calif., was recently promoted to general safety supervisor of Coast Lines, with headquarters in Los Angeles. Baker has served the Santa Fe Railway since 1914. In addition to his

promotion, each division on the Coast Lines will be assigned a safety supervisor. Other appointments include: **S. S. Allison,** safety supervisor, Los Angeles Division, headquarters, San Bernardino; **L. R. Villermin,** safety supervisor, Arizona Division, headquarters, Needles; **W. J. Tillman,** safety supervisor, Albuquerque Division, headquarters, Winslow; and **Norbert F. Young,** safety supervisor, Valley and San Francisco Terminal Divisions, with headquarters in Fresno.

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Earle A. Lloyd, former Director of Aeronautics for the City of Long Beach, Calif., has joined the staff of the Civil Aeronautics Administration, Sixth Region, Southern California District Airport Office, located in Los Angeles. Lloyd has been identified with aviation in the Southwest for many years, and is remembered for his work as planning engineer with the Los Angeles County Regional Planning Commission in the study and publication of the Master Plan of Airports for Los Angeles County in 1940.

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Robert E. Tobin, civil engineering instructor at Gonzaga University, has been appointed district engineer for the Portland Cement Association at Spokane. He succeeds **Pat Newland.** Tobin is a graduate of the University of Wyoming and received his master of science degree from Iowa State College for research in concrete slabs. He joined the engineering faculty of Gonzaga in 1940, and during the war was engaged in design of the Farragut naval training station at Sand Point, Idaho.

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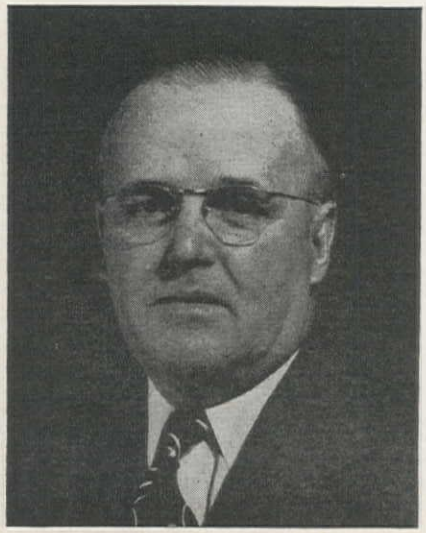
John C. Gist was recently elected a vice-president of A. Teichert & Son, Inc., Sacramento, Calif. Gist has been associated with the Teichert enterprises since 1940 when he supervised the construction of the Leevining conduit for the City of Los Angeles Department of Water & Power. During the war years he superintended construction of such national defense projects as the Santa Barbara Municipal Airport at Goleta, Calif., various Arizona airports, and more recently was project manager for the operations of the joint venture of MacDonald & Kahn, Inc., A. Teichert & Co., and John C. Gist on construction of the new Sacramento Signal Depot, near Sacramento.

JOHN C. GIST



Robert C. Brown recently left for China where, on loan from the Bureau of Reclamation, he will join the program planning staff or UNRRA engaged on the Yellow River project. Brown, who will serve as technical adviser, expects to engage a staff of Chinese engineers and will remain in China through September. He has been with the Bureau of Reclamation since 1938, and has been engineer on the Bureau of Reclamation San Luis project in Colorado.

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E. J. Stuber has entered the employ of Bethlehem Pacific Coast Steel Corp., Fabricated Steel Construction Division, as contracting engineer with offices in Alameda, Calif. He has been connected with the Bethlehem organization since 1940, doing metallurgical work at the Lackawanna, N. Y., plant until World War II, in which he served as a lieutenant in the Navy.

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William A. Taylor, former contractor of Great Falls Mont., **Bryan E. Fry,** former engineer at Fort Peck dam, and **Gordon Peters** of Malta, Mont., are establishing a new building and engineering service at Malta. To be known as Bowdoin Builders, the new firm will offer both construction and engineering services, and in addition will stock a line of building supplies.

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A. C. Eddy, chief engineer of way and structures for the B. C. Electric Railway and widely known in engineering circles, has retired after 34 years' service with the company. Eddy was a railroad construction engineer in pioneer days, having come to the Northwest in the '90's to help build the Great Northern Railroad's lines between Seattle and the border. He had been chief engineer for British Columbia Electric since 1937.

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Arthur W. Greeley, of the division of timber management in the Chief Forester's office, Washington, D. C., has been selected as supervisor of the Lassen National Forest with headquarters at Susanville, Calif. He succeeds **Norman Norris,** who has retired because of ill health. Greeley has been with the Forest Service since 1935, and is the son of **Col. William B. Greeley** of Seattle, chairman of the board of trustees of American Forest Products Industries.

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R. H. Workinger has been transferred from the Washington, D. C., office of the Bureau of Reclamation to Billings, Mont., to assume the position of executice officer of Region 6 Missouri Basin Project Activities Staff. As executive officer he will be responsible for providing administrative supervision of the functions of the project activities staff.

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Harry W. Morrison, president of Morrison-Knudsen Co., was re-elected president of the Southwestern Idaho Water Conservation Project, Inc., at the annual meeting of the organization in Boise late in December. Other officers, all re-elected, include **J. L. Driscoll,** vice-president; **E. W. Rising,** vice-president and Washington, D. C. representative; **William E. Welsh,** secretary; and **W. W. Howell,** treasurer.

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A. J. Armstrong is the recently appointed president of the Vancouver, B. C., Building & Construction Industries Exchange, with **Fred Welsh,** Welsh Plumbing & Heating Co., as first vice-president and **Ralph C. Pybus,** Commonwealth Construction Co., second vice-president. New directors include **Fred J. Hale,** Empire Sheet Metal Co.; **J. F. Sigurdson,** Sigurdson Millwork Co., Ltd.; and **John Tucker,** Dominion Construction Co.

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L. W. Friberg has been appointed division engineer for the Public Buildings Administration's new Pacific Northwest division and will be in charge of all PBA work in Washington, Oregon, Idaho, Montana, and Alaska. Friberg was transferred from Denver, and has established offices in the U. S. Court House in Seattle.

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Fairman B. Lee, electrical engineer, was elected president of the Seattle Engineers Club for 1947 at the annual meeting of the organization. Other officers for this year include **Ralph F. Dreitzler,** vice-president; **Evans K. Blackford,** re-elected secretary; and **Roger I. Woglum,** treasurer.

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J. R. Bromley was reappointed State Highway Superintendent at a recent reorganization meeting in Cheyenne, Wyo., of the state highway commission. **George Donnell** of Worland was elected commission chairman to succeed **C. F. Schoonmaker** of Lander, whose term has expired. **Walter Davis** of Cheyenne was re-elected secretary.

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A. S. Macdonald has been elected president of the Tacoma Chapter of Associated General Contractors. Macdonald succeeds **Sam Bergeson** who served the Chapter during its first year of existence. Other officers for this year include **Ray R. Kelly,** vice-president, and **J. A. Harrison,** secretary-treasurer. **William A. (Bill) Osborne** was reappointed as manager for the Chapter.

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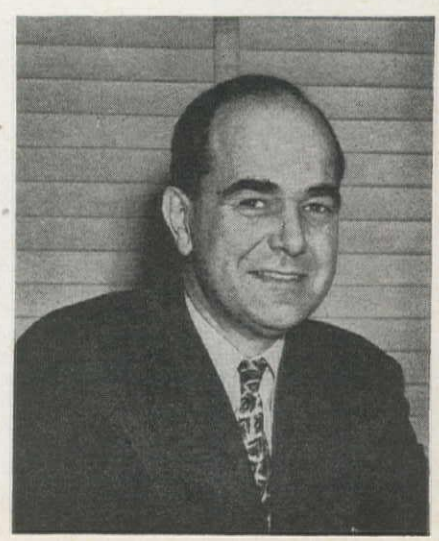
After thirty years in Government service, **E. B. Debler,** Director of Region 7 of the Bureau of Reclamation at Denver, Colo., retired the end of April. **Avery A. Batson,** who succeeds Debler as head of Region 7, comprising Nebraska and large sections of Colorado, Kansas and Wyoming, has been in the Federal service since 1934. Until this appointment as acting regional director he held the post of assistant director for the Region.

AVERY A. BATSON



J. W. Robinson, former representative of Utah, has been appointed chief of the branch of Range Management in the Bureau of Land Management, it was announced recently by **J. A. Krug,** Secretary of the Interior. Robinson will exercise supervisory control under the Director of the bureau over policy and administrative problems involving the grazing of nearly 11 million head of livestock on more than 250 million acres of Federal range land in 13 western states.

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John W. Banks has established an engineering practice in Seattle where he will specialize in quantity survey work, preparing detailed materials lists for all construction projects offered for bids. Banks was associated with construction organizations in Texas prior to the war, and served with the Corps of Engineers until last August.

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Faye B. Comeau is now chief engineer for the California Steel Products Co. of Richmond, Calif. He resigned as engineer from Columbia Steel Co.'s Oakland office to take his new position. Previously he has been connected with several engineering firms in the San Francisco Bay area.

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Glenton G. Sykes, formerly research associate with the U. S. Forest Service, then engineer with the Corps of Engineers flood control and military construction, was recently formally appointed as city engineer of Tucson, Ariz. Sykes has been serving in the capacity of city engineer for some time previously.

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George R. Anderson, Jr. is office engineer for Morrison-Knudsen Co., Inc., on the construction of a large industrial plant at Plaster City, near El Centro, Calif. In addition to his other duties, Anderson is engineer in charge of machinery and equipment consisting of crushers, conveyors and special equipment.

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A. L. Carruthers was recently named deputy minister of public works for British Columbia, succeeding **Arthur Dixon.** Carruthers, who joined the department in 1917, has served as district engineer at Prince Rupert and chief bridge engineer at Victoria, and has been chairman of the highway board and chief engineer.

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Atilio Cappa, chief engineer for the Argentine State Railways in South America, visited Washington last month to make an inspection of the 8-mi. Cascade tunnel of the Great Northern railway. Cappa's inspection was in preparation for the drilling of a railroad tunnel through the Andes Mountains between Argentina and Chile.

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Pete Hauskens and **Hanen H. Williams** are occupying adjoining offices in Phoenix, Ariz. at present. Hauskens specializes in architectural mechanical drafting, while Williams, a member of the ASCE, is head of Williams Engineering Co., civil and structural engineers.

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George McLean, engineer with the Washington highway department, has been placed in charge of a new field office just opened at Aberdeen, Wash. The new office will be headquarters for supervision of highway projects in Grays Harbor County.

E. B. HICKOK, formerly safety engineer and auditor for Sound Engineering & Construction Co., is the new secretary-manager of Seattle Chapter AGC.

Ben Balala, structural engineering associate with the Division of Architecture, Sacramento, Calif., has joined the staff of **Jesse E. Hayes,** Structural Engineer of San Francisco, with offices at 58 Sutter St.

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William O. Owens, formerly assistant area engineer at Forts Canby and Columbia, has been appointed resident engineer at Fort Stevens at the mouth of the Columbia River in Oregon. Owens suceeds **Olney J. Hawkins** who has been appointed head of the maintenance branch in the Portland district of the Corps of Engineers. Hawkins will also head the rivers and harbors section of the maintenance branch.

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E. C. Brown heads the new district office of the Public Roads Administration at Sacramento, Calif. He is a member of the Sacramento Section of the American Society of Civil Engineers.

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Fred W. Rodolf, chief of hydrographic surveys in the Portland district of the Corps of Engineers, has returned to Portland from a 9-months trip to Afghanistan as a member of the engineering staff of Morrison-Knudsen Co.

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J. H. Ludwig is now with the U. S. Corps of Engineers at Sacramento, Calif. Prior to the war, in which he served as a captain in the Air Corps, he was with the U. S. Engineers at Portland, Ore.

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H. Bradley was recently elected president of the B. C. Contractors' Association at Victoria, B. C. **A. H. Winters** was elected as vice-president, and **P. M. Townsend** will serve as secretary-treasurer. Recently elected executive council includes **D. Donaldson, E. Cross, W. J. Drysdale, A. Whiteman, W. Bartlett** and **A. E. Evans.**

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George Hatch is now located in Denver, Colo., where he is materials engineer in the geology section for the U. S. Bureau of Reclamation. Hatch was recently transferred to the Bureau from the U. S. Engineer Office, Honolulu, T. H.

SUPERVISING THE JOBS

Edward C. Kelberg is general superintendent on construction of a store building at Stockton and Geary Sts., San Francisco. Dinwiddie Construction Co. are the contractors, with **Edward M. Knapik** as their resident engineer and **George F. Krenkel** as assistant superintendent. Carpenter foremen include **Ammon Witmer, Dean Smith, Orville F. Jones, George J. Lynn,** and **Weldon J. Taylor.** Office men are **B. F. Venturi, F. J. Worman,** and **Gordon Spears. Pete Rizzie, Gabriel Flaviani,** and **Charles Hassan** are labor foremen. Other key men include **George Uland,** maintenance superintendent; **James E. Burke,** inspector; and **Hans G. Tittel, Ted Lauridsen,** and **George Chambers** as detailers. Judson-Pacific-Murphy have the steel subcontract, with **V. Smith** as their superintendent and **J. W. Leaser** as their foreman.

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Sidney A. Davis is supervising construction of a 7-story office building at Main and Market Sts., in San Francisco, Calif., for Swinerton & Walberg, contractors. **Sid Osburn** is general carpenter foreman; **Jack Bowman** and **Harold Hanson** are carpenter foremen; **Tony Lopez** is labor foreman, and **Verne Rodgers** is office manager for the project. **Garland T. Oliver** is job engineer; **Roy A. Delph** is resident engineer, and **George Hess** and **Leland S. Rosewer** are civil engineers. **Vern H. Vladyka** is superintendent and **Joe Cerruti** is foreman for the subcontractors.

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J. B. Batchker is supervisor for the Wonderly Construction Co. in their construction of a reservoir at the east end of Parish Place, Burbank, Calif. **Clarence Shadel** is resident engineer on the job, with **M. S. Sheeran** as general foreman and **H. R. Conkling, Paul Ager,** and **E. Mickey** as general carpenter foremen. **J. B. Johnson** is chief engineer, with **L. W. Dolliver** as chief of party and **J. H. McCambridge** as general manager of public works. **Claude Holder** and **"Tin" Ford** are labor foremen on the project, expected to be completed by November.

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Russell "Red" Whittaker was job superintendent for L. E. Dixon Co., San Gabriel, Calif., who recently completed a two-story concrete factory building on S. Main St., Los Angeles. **Arthur Froehlich** was archi-

tect for the job, with **Irving Ullman** as field superintendent for the architect. **Charles E. Stickney** was structural engineer; **A. B. McCord,** timekeeper and accountant; **George F. Pierce,** general foreman; **C. H. Shirley,** carpenter foreman; **Frank Almenar,** labor foreman; **Ben Hawkins,** steel superintendent and **M. J. Howlett,** plumbing foreman.

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Martin Green is now superintendent, Southern California Area, Morrison-Knudsen Co., Inc., Highway Division, located at South Gate, Calif. He was formerly district manager for A. Teichert & Son, Inc., in the Stockton, Calif., area. Other key personnel for the M-K highway division in southern California are: **Art Foley,** office manager; **Gornard Keller** and **Robert J. Stoddard,** general foremen, **Herbert Pulley, Dudley Gates, Curtis Crivelli,** foremen; **Bill Thomspon,** engineer; and **Lee Turner,** master mechanic.

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P. L. Vail is superintending construction of temporary school buildings on the UCLA campus at Westwood, Los Angeles for Stewart J. Stronach and Assoc., Inc. **T. R. Mini** is project engineer, with **Ronnie Frazee, Barney Johnson** and **Peter De Cond** as carpenter foremen and **J. Bennett** and **J. Saunders** as labor foremen. Other important men on the job include: **George Burton,** office manager; **E. C. Boland,** expediter; **W. Isaac,** paymaster, and **D. A. McMillan,** field engineer.

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Adolph Bauer is superintending highway construction of 7.4 mi. between Salinas and Gilroy, Calif., for A. Teichert & Son, Inc. Grade foremen for the job which extends from Crazyhorse Summit to Chittenden Rd., are **Chas. Homan, Monty Quijada,** and **Jim Stinson. Bob Younger** is structural foreman, **W. A. Peckham,** office manager, and **P. A. Hamm,** master mechanic. **"Vic" Pearson** is resident engineer for the project.

* * *

William Hughes is acting as general superintendent for James I. Barnes on their construction of a headworks building at the Hyperion Outfall sewer, El Segundo, Los Angeles. **M. M. Wuder** is his assistant, with **Geo. F. House** as carpenter foreman. Other key men include office manager **Willard Flinders,** and **Bert Mann,** who is inspector in charge.

* * *

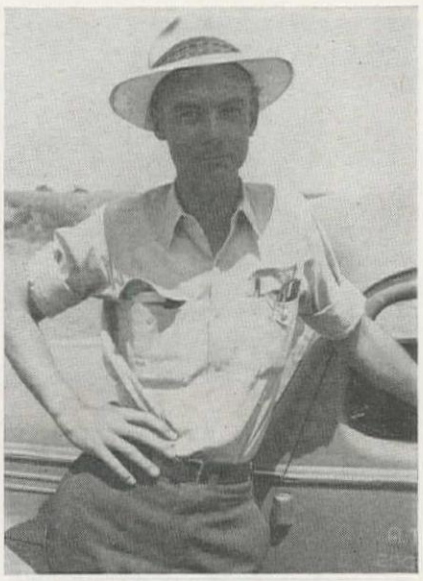
Carroll Glenn is Guy F. Atkinson Co.'s general superintendent of the pier-pile driver crew for the Hyperion Outfall sewer in El Segundo, Calif. Pile driver foremen for the job include: **Ray Brigance; R. C. "Pete" Bassette; Richard Carskelan; Chas. Holloman; Lou Lentz; Otis Smith; Wilson Jones; Morgan Hayes; Dick Jones;** and **John Glenn.**

* * *

Mitchell S. Bennich is general superintendent for P. & J. Artukovich, contractors of Los Angeles, on their $1,952,798 contract for the installation of pipe in connection with the Second Mokelumne Aqueduct. The work is on Unit B, between Geary Rd., Walnut Creek and Bixler St., near Brentwood, Calif. **Lionel Pedley** is project manager. **Ernest Leppert** is purchasing agent.

* * *

George Mashon is in charge of construction of the Esperanza St., Indiana St., and Olympic Blvd. bridges for the Haddock



MARTIN GREEN

Co. on the Santa Ana Parkway in Los Angeles. **Jack Arave** is job superintendent, with **Jack Erwin** and **Art Anderson** as carpenter foremen and **Dwight Mathias** as field engineer for the company. Representing the bridge department are resident engineer **A. K. Gilbert** with **C. S. "Tommy" Tomkins** assisting.

* * *

Jack Ogden is supervising the job for the Wm. Simpson Co., who are erecting a radio and television building in Hollywood, Calif. **Chet Umbarger** is general carpenter foreman with **Bob Burch** and **Paul Andrews** as carpenter foremen under him. **Frank Martinez** is general labor foreman, with **Marvin Pere** as office manager. Basement and part of the three-story building are of concrete and steel.

* * *

General superintendent for N. M. Ball Sons on construction of a 4-lane divided state highway 8 mi. long near San Jose,

KEITH WASSON is Peter Kiewit Sons' Co. general superintendent on their project on the Friant-Kern canal in California. LESTER BROWN is Wasson's assistant on the canal job.

Photo courtesy "The Explosives Engineer"

Calif., is **Wayne Morris,** with **A. W. Walsh** as resident engineer, and **M. L. Simpson** as project manager. Foremen include **Earl Boswell,** grade foreman; **Slim Wentworth,** concrete foreman; **Tony Yung,** master mechanic; and **E. D. Grey,** labor foreman. **Walt Carson** is office manager for the job. Started in January, 1946, the highway is expected to be completed by the end of April.

* * *

M. E. Mueller is in charge of construction for the Austin Co., who are building an iodine chemical plant in Los Angeles, Calif. **J. B. Williams** is job engineer with **Lawrence Haley** as carpenter foreman and **Johnnie Langendorf** as pipe foreman. **John Hendrickson** is auditor.

* * *

A. E. Sinclair is general superintendent for Earl W. Heple Co., on their construction of a drive-in theater at Palo Alto, Calif. **John Amaral** is carpenter foreman for the job, which is expected to be completed by June 1, while **L. F. Richards** is resident engineer.

* * *

E. V. Schon is superintendent, **A. Wittmer,** carpenter foreman; **John Entwistle,** layout foreman; and **Ed Salveson,** timekeeper for the Dinwiddie Construction Co., Inc., of San Francisco who are erecting the Roos Bldg. in San Jose, Calif.

* * *

T. Carl Dybdal, assisted by **Arnold Thomas,** is superintending construction for Parker, Steffen & Pearce Co., San Francisco contractor, on the million dollar addition to the W. P. Fuller Co. plant in South San Francisco. **L. H. Niskian** is construction engineer; **Les Lipinski** job engineer.

* * *

Morley Benjamin is supervising construction of 49 frame and stucco, five-room dwellings for the Morley Construction Co., Los Angeles. The $325,660 job is on Judd and Filmore Sts., Van Nuys District, Los Angeles County.

* * *

Geo. W. Tombleson is project manager for Vern R. Huck on the construction of a theater building at Soledad, Calif. **W. C. Ehrich** and **H. A. Sawyer** are foremen on the job, expected to be completed by May 15.

* * *

Jay Cox is in charge of construction for the Western Asphalt Co., Seattle, Wash., on their $125,774 job calling for 72.9 mi. of surface and seal coat between Republic and Alice Creek, Republic and B. C. boundary.

* * *

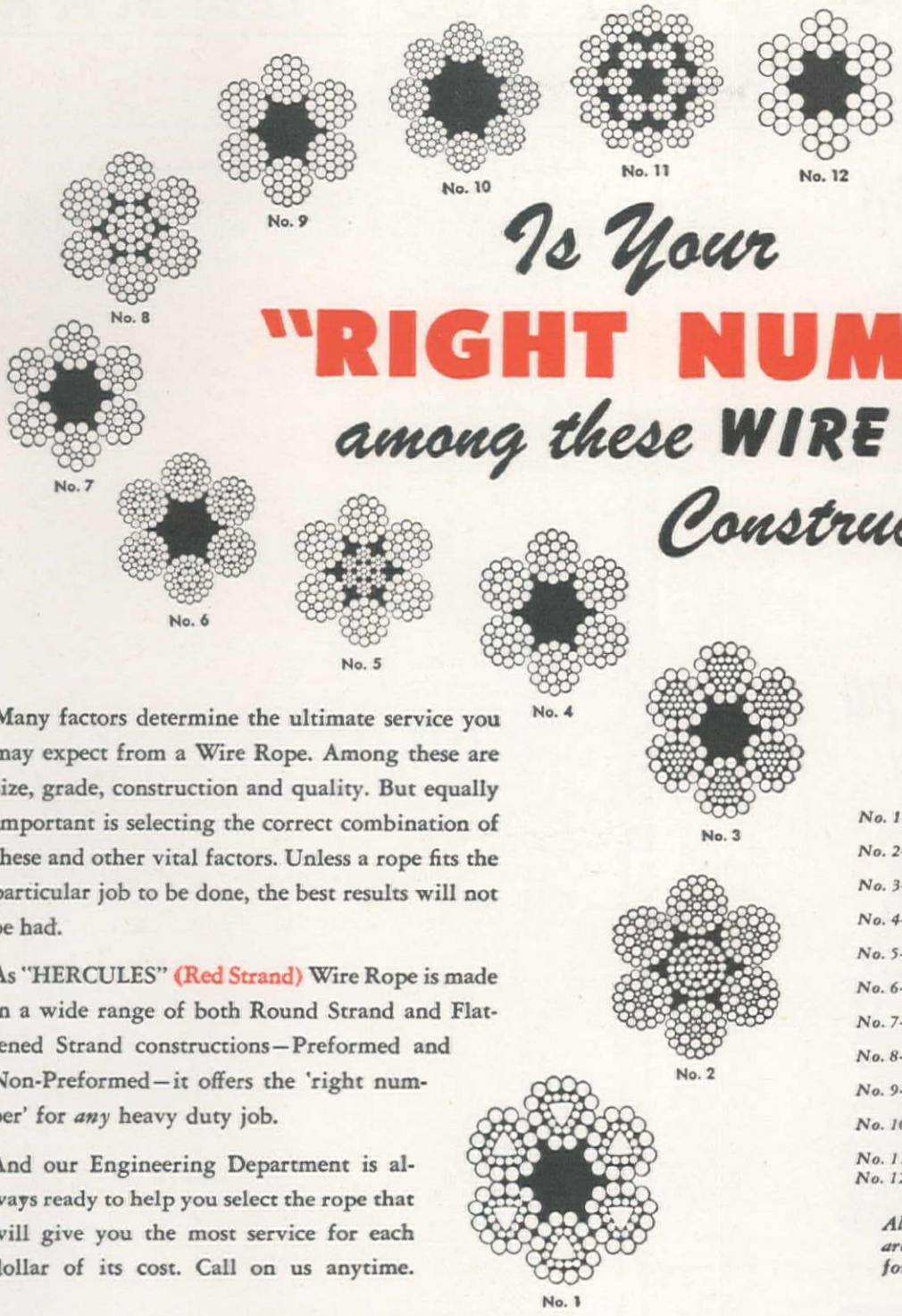
Construction of a church in Brentwood, Calif., by the Pozzo Construction Co. is being supervised by **R. R. "Cy" Randall.** Other key men include **H. Bowder** as carpenter foreman, and **T. K. Wright.**

* * *

E. L. Christman is job superintendent for Morrison-Knudsen Co., Inc., Salt Lake City, Utah, on a $200,000 negotiated contract calling for construction of dikes around the Municipal Airport, Provo, Utah.

* * *

Chet Reynolds is job superintendent and **Ray Hender** general foreman on the overpass at San Mateo, Calif. Macco Construction Co. is the contractor.



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UNIT BID SUMMARY

Dam . . .

Oregon—Lane County—Corps of Engineers—Earth Fill

Guy F. Atkinson Co., South San Francisco, Calif., W. E. Kier Construction Co. of Portland, A. Teichert & Son, Inc., Sacramento, Calif. and Bressi-Bevanda Constructors, Inc. of Portland (joint venturers), submitted the low bid of $7,737,570 and were awarded the contract by the Corps of Engineers, Portland, for the construction of the earth fill Dorena Dam and appurtenant work. The dam is to be built about 2 miles below Dorena on the Row River, a tributary of the Coast Fork of the Willamette River. Unit bids follow:

(1) Guy F. Atkinson, W. E. Kier Construction Co., A. Teichert & Son, Inc., Bressi-Bevanda Constructors $7,737,570
(2) Morrison-Knudsen Co., Inc., Peter Kiewit Sons Co., Natt McDougal Co., Raymond Concrete Pile Co., S. Birch & Sons, C.&F. Trucking Co., McLaughlin, Inc. 8,380,000

	(1)	(2)
70,000 cu. yd. excav. river div. channel	.60	.70
2,000 cu. yd. rock excav., river div. channel	2.00	3.00
Lump sum, clear reservoir and dam site areas	$386,230	$611,356
214,000 cu. yd. stripping	.45	.50
7,500 cu. yd. com. excav., ditches	.75	1.00
300 cu. yd. rock excav., ditches	3.50	6.00
2,700 cu. yd. excav., sub-drains	5.20	5.00
500 cu. yd. rock excav., sub-drains	8.00	15.00
2,730 lin. ft. 8-in. perf. C.I. pipe	3.75	9.00
820 lin. ft. 8-in. C.I. pipe	3.00	6.00
128 lin. ft. 48-in. R.C. pipe	20.00	20.00
2,700 cu. yd. sand filter, drains	5.50	7.00
700 cu. yd. gravel filter, drains	5.50	7.00
155,000 cu. yd. pervious zone matl.	1.15	2.50
68,000 cu. yd. excav., spillway	1.10	1.00
55,000 cu. yd. rock excav., spillway	5.25	3.00
62,000 cu. yd. excav., core trench	.45	1.00
5,000 cu. yd. rock excav., core trench	3.50	3.00
4,000,000 cu. yd. borrow excav.	.46	.50
620,000 cu. yd. embank., Zone 1 and random gravel cover	.16	.22
1,131,000 cu. yd. embank., Zone 2	.20	.22
1,114,000 cu. yd. embank., Zone 3 and gravel toe	.16	.22
320 cu. yd. conc. trashrack struct.	80.00	72.00
1,250 cu. yd. conc. retaining wall	50.00	42.00
4,150 cu. yd. conc., spillway train. walls, still. basin	42.00	38.00
30 cu. yd. conc. recorder house	100.00	130.00
25 cu. yd. conc. headwalls	60.00	72.00
150,000 bbl. cement	4.85	5.40
1,375,000 lb. reinf. steel	.09	.11
2,600 lb. met. water stops	1.25	1.50
23 ton asph. for seals	200.00	360.00
34,000 lb. struct. steel	.24	.22
Lump sum, 10 outlet gates	$420,000	$348,000
62,500 cu. yd. embank., tailwater channel, levee and access road	.16	.22
120,000 M. sq. ft. addtl. rolling	.26	.12
127,000 cu. yd. excav., tailwater channel	.35	.80
1,800 cu. yd. rock excav., tailwater channel	3.50	3.00
2,500 cu. yd. excav., div. levee embank.	.50	.50
50,000 cu. yd. excav., from stockpiles	.44	.45
7,000 lin. ft. A founda. grout holes	3.00	2.60
5,000 lin. ft. B founda. grout holes	3.00	2.60
2,000 lin. ft. drill through overburden B grout holes	7.00	2.60
52 ea. grout outlet holes	6.50	4.50
3,000 lin. ft. founda. drainage holes	6.00	4.50
43,000 lb. misc. pipe and fittings	.45	.50
200 lin. ft. copper grout stops	3.20	8.00
10,000 cu. yd. pressure grouting	1.50	3.00
30,600 cu. yd. sel. gravel backing	1.90	2.40
61,000 cu. yd. dumped revetment	1.90	3.00
14,300 cu. yd. derrick pl. revetment	5.00	5.00
15,000 M. gal. sprinkling	1.75	2.00
3,000 cu. yd. gravel surf., road	2.00	3.25
10 acres, seeding	$1,000	500.00
146,000 cu. yd. conc., spillway and abutment	12.95	12.00
8,800 cu. yd. conc., stilling basin and outlet channel	19.00	15.00
Lump sum, sump pump and motor	$2,650	$2,400
30,000 lb. misc. metal	.50	.36
51,000 lb. misc. pipe and fittings	.45	.50
Lump sum, elect. work	$37,000	$36,000
Lump sum, addtl. entrance struct., etc.	$4,000	$3,000
660 lin. ft. 6-in. por. conc. drains	2.50	7.00
2,700 lin. ft. 12-in. drain tile	2.50	4.00
6,500 lin. ft. dr. and gr. anch. bars	1.10	1.60
Lump sum, install standby power unit	$4,000	$2,500
150,000 bbl. cement, ALT. No. 1	4.85	.....
150,000 bbl. cement, ALT. No. 2	4.85	.....
150,000 bbl. cement, ALT. No. 3	4.85	.....

New Mexico—Colfax County—City—Enlarge Dam

W. T. Bookout Construction Co. of Las Vegas, was awarded a $396,186 contract by the City Water Works, Raton, to enlarge the earthfill dam at Lake Maloya, to remove and reconstruct spillway and valve house. The work is located at Chicorico Creek about 9 miles north of Raton. Unit bids were received as follows:

(1) W. T. Bookout Construction Co. $396,186
(2) D. D. Skousn & Floyd Davis 402,084
(3) C. L. Hubner 412,216
(4) Miller-Clarkson, Inc. $445,042
(5) Engineer's Estimate 375,712

	(1)	(2)	(3)	(4)	(5)
Lump sum, remove spillway	$5,000	$3,000	$6,000	$2,000	$4,000
Lump sum, remove valve house	$2,000	$1,000	$1,000	800.00	775.00
550,000 cu. yd. common excav.	.35	.40	.36	.46	.35
4,585 cu. yd. rock excav., for riprap	1.50	1.00	1.25	.....	.....
200 cu. yd. rock excav., waste material	2.00	2.00	1.25	1.75	3.00
45,500 sq. yd. foundation prep.	.19	.10	.20	.20	.07
5,000 hr. roller, tamping	6.00	6.00	3.00	7.00	5.00
5,000 M. gal. watering	1.50	1.50	1.00	1.00	1.50
14,055 sq. yd. riprap	1.50	1.75	3.50	2.00	2.10
276 sq. yd. grouted rubble masonry	5.00	20.00	10.00	10.00	5.00

(Continued on next page)

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1. Double Center Drive power transmission on turntable which
   a. Applies power directly, fully concentrated on any one operation, or —
   b. Spreads power for high speed simultaneous operations.
2. Roller bearing mounted swing drums.
3. Extra wide crowd clutch mounted on anti-friction bearings.
4. Hydraulic Coupling (fluid clutch) eliminates digging impacts and shocks, protects machinery—engine can't stall.
5. Chain drive crawler, 2 speeds in either direction—15'6" long.
6. Positive safety travel and tread lock.
7. Enclosed crawler propelling mechanism runs in oil bath.
8. Drop forged crawler treads—34" wide, swamp type.
9. All-welded, all-steel, shovel boom and stick.
10. Positive, powerful independent chain crowd.
11. Simultaneous hoist, swing and travel on all cranes, clams, drags.
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740 lin. ft. 18-in. steel pipe	8.00	12.00	14.00	17.00	6.00
210 lin. ft. 24-in. conc. pipe	15.00	10.00	15.00	15.00	10.00
425 lin. ft. 18-in. conc. pipe	11.00	9.00	13.00	14.50	7.00
70 lin. ft. 12-in. corr. metal pipe	4.00	5.00	3.00	2.65	3.10
182 lin. ft. 18-in. corr. metal pipe	7.00	6.00	4.00	4.00	3.75
88 lin. ft. 24-in. corr. metal pipe	8.00	7.00	5.00	5.50	4.50
56 lin. ft. 36-in. corr. metal pipe	11.00	10.00	9.00	9.00	7.25
500 lin. ft. 6-in. vit. clay pipe	1.00	1.50	2.00	1.00	3.50
3,000 cu. yd. spillway excav.	1.50	1.00	1.50	.90	.75
800 cu. yd. spillway backfill	1.00	3.00	1.00	2.00	2.00
1,006 cu. yd. conc., spillway	50.00	38.00	47.00	37.00	45.00
96,680 lb. reinf. steel, spillway	.10	.08	.10	.10	.105
7,980 lb. struct. steel, spillway	.30	.25	.15	.40	.15
111 lin. ft. rubber water stops, spillway	2.25	2.00	3.00	1.50	2.50
Lump sum, valve house	$18,000	$14,000	$17,000	$13,500	$10,000
Lump sum, blowoff jump box	$4,800	$4,000	$6,500	$4,500	$4,500
Lump sum, wasteway weir	$8,000	$6,000	$6,500	$6,500	$19,600

California—Los Angeles County—County—Alterations

MacDonald & Kruse, Inc., and Hensler Construction Corp., Glendale, submitted the low bid of $368,390 to the County Flood Control District, Los Angeles, to alter San Gabriel Dam No. 2 and to construct reinforced concrete facing slabs. The dam is located on the west fork of the San Gabriel River, about 20 miles from the City of Azusa. The following unit bids were submitted:

(1) MacDonald & Kruse, Inc., & Hensler Construction Corp. $368,390
(2) Elliott Stroud Seabrook 370,086
(3) Johnson Western Co. 384,530
(4) Guy F. Atkinson Co. $416,283
(5) Macco Corp. 430,870
(6) A. Teichert & Son, Inc. 447,047
(7) L. E. Dixon Co. 498,557

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
60,000 cu. yd. excavation	1.00	1.30	.73	1.50	1.10	1.25	2.90
Lump sum, divert water	$20,000	$15,600	$7,000	$5,000	$25,200	$34,000	$41,741
Lump sum, remove timber facing	$40,000	$21,000	$25,000	$30,000	$48,000	$25,600	$60,000
70 cu. yd. remove conc. and gunite	30.00	30.00	75.00	40.00	25.00	40.00	40.00
158 ton furn. and pl. bitum. conc.	20.00	25.00	28.00	30.00	40.00	28.00	44.00
121 copper water seal, "A" jts.	20.00	12.00	28.00	25.00	25.00	35.00	25.00
66 copper water seal, "B" jts.	20.00	12.00	24.00	25.00	20.00	26.00	19.10
27 copper water seal, "C" jts.	20.00	10.00	15.00	20.00	15.00	12.00	16.00
8,506 lin. ft. 18-in. and 24-in. copper water seal strip	.75	1.00	1.75	1.50	.80	2.75	1.10
8,956 lin. ft. furn. and pl. "Elastite"	.75	.80	.95	1.00	.50	1.10	.60
8,956 lin. ft. furn. and pl. "Celotex"	.60	.50	.65	1.00	.40	1.00	.60
9,523 lin. ft. furn. and pl. asb. putty	.25	.35	.40	.30	.20	.15	.12
300 lin. ft. drill dowel holes	2.00	2.00	1.35	3.00	2.50	2.00	2.50
200 lin. ft. drill floater slab holes	2.00	2.50	10.00	3.00	2.50	2.00	2.50
500 sacks cement for grouting	5.00	3.00	4.50	7.00	3.50	8.00	3.50
500 sacks cement for gunite	8.00	4.00	5.00	10.00	7.00	12.00	5.00
100 cu. yd. sand blast'g and straighten, steel	20.00	20.00	30.00	22.00	40.00	21.00	32.00
480,000 lb. cut and pl. reinf. steel	.04	.035	.035	.03	.03	.03	.025
5,400 cu. yd. place unformed concrete	30.00	27.00	35.50	35.00	37.00	35.50	40.00
8,400 bbl. furn. P.C.	3.25	3.60	5.00	3.50	4.45	4.30	6.00

Irrigation . . .

Wyoming—Park County—Bureau of Reclam.—Ralston Lateral

Otis Williams & Co., Helena, Montana, submitted the only bid to the Bureau of Reclamation at Cody in the amount of $502,833 for the construction of the Ralston Lateral from station 0-84.12 to station 230-52.57, and sublaterals, Heart Mountain Division, Shoshone Project. The work is situated in the vicinity of Ralston. The unit bid follows:

(1) Otis Williams & Co. $502,833

	(1)
146,500 cu. yd. excavation for lateral	.40
3,700 cu. yd. compacting embankments	.60
40,000 sta. cu. yd. overhaul	.05
1,800 cu. yd. excavation for drainage channels and dikes	.50
52,000 cu. yd. excavation for structures	1.80
30,100 cu. yd. backfill	.40
12,350 cu. yd. compacting backfill	1.00
3,000 sq. yd. dry-rock paving	4.50
5,760 cu. yd. concrete in structures	47.50
480,000 lb. placing reinforcement bars	.055
100 sq. ft. placing elastic filler material in joints	1.90
9 M.B.M. erecting timber in structures	60.00
1,420 lin. ft. laying 18-in. diam. concrete pipe	1.50
160 lin. ft. laying 24-in. diam. concrete pipe	2.00
144 lin. ft. laying 30-in. diam. concrete pipe	2.50
186 lin. ft. laying 18-in. diam. corrugated metal pipe	.75
108 lin. ft. laying 24-in. diam. corrugated metal pipe	1.00
52 lin. ft. laying 30-in. diam. corrugated metal pipe	1.25
30 lin. ft. laying 36-in. diam. corrugated metal pipe	2.00
56 lin. ft. laying 42-in. diam. corrugated metal pipe	3.00
26 lin. ft. laying 48-in. diam. corrugated metal pipe	3.00
15,500 lbs. installing gates	.15
8,200 lbs. installing misc. metalwork	.15

California—Contra Costa County—Bur. of Reclam.—Earthwk. & Lining

Parish Bros. of Benicia were low before the Bureau of Reclamation at Antioch with a bid of $1,072,147 for earthwork, canal lining and structures, from Station 1993 plus 11 to Station 2321 plus 25, Contra Costa Canal, Clayton and Ygnacio Canals. The work on the Contra Costa Canal is situated from about 1 mile south of Hookston, to about ½ mi. west of Pacheco. The work on the Clayton and Ygnacio Canals is situated from 3 miles northeast to 4½ miles south of Concord. The unit bids are as follows:

	Schedule 1	Schedule 2	Schedule 3	Total
(1) Parish Bros.	$650,046	$237,187	$184,914	$1,072,147
(2) Guy F. Atkinson Co.	843,690	247,101	187,360	1,278,152
(3) Fredrickson & Watson Construction Co.	965,878	268,392	228,963	1,463,233

SCHEDULE NO. 1

	(1)	(2)	(3)
28 ac. clear orchards and vineyards	100.00	135.00	165.00
27 ac. grub orchards and vineyards	50.00	135.00	120.00
186,000 cu. yd. excav. for canal	.67	.62	.80
134,000 sta. cu. yd. overhaul	.02	.02	.02
16,000 cu. yd. compacting embankments	.45	.23	.46
45,000 cu. yd. excav. for struct.	.90	2.00	2.25
220 cu. yd. excav. in tunnel under hwy.	25.00	27.00	20.00

(Continued on next page)

11,300 lb. erect perm. steel supports in tunnel	.15	.12	.2
3 M.B.M. erect. perm. timber in tunnel	250.00	150.00	225.0
59,400 sq. yd. trim foundations for conc. lining	.75	.75	.9
39,400 cu. yd. backfill	.42	.54	1.2
11,000 cu. yd. compact backfill	1.65	2.90	3.0
3,450 cu. yd. conc. in struct.	65.00	82.00	87.5
90 cu. yd. conc. in tunnel	65.00	75.00	90.0
2,450 cu. yd. conc. in reinf. canal lining	20.00	33.00	36.5
2,450 cu. yd. conc. in unreinf. canal lining	20.00	35.00	37.5
368,000 lb. pl. reinf. bars in struct. and tunnel lining	.055	.08	.0
150,000 lb. pl. reinf. bars in canal linings	.08	.08	.0
430 sq. yd. dry-rock paving	10.00	10.00	8.0
216 lin. ft. drive timber piles	3.00	7.00	4.5
75 M.B.M. erect timber in bridges	120.00	120.00	150.0
10 ea. constr. cattleguards	150.00	125.00	157.0
100 lin. ft. lay 12-in. diam. conc. pipe	1.50	1.30	1.5
340 lin. ft. lay 15-in. diam. conc. pipe	1.85	1.50	2.0
590 lin. ft. lay 18-in. diam. conc. pipe	2.40	2.00	2.5
400 lin. ft. lay 24-in. diam. conc. pipe	3.50	3.00	3.0
180 lin. ft. lay 30-in. diam. conc. pipe	5.00	3.25	4.0
12,000 lb. install gates	.25	.16	.4
7,300 lb. install misc. metalwork	.40	.32	.5

SCHEDULE NO. 2	(1)	(2)	(3)
5 ac. clear orchards and vineyards	100.00	135.00	165.00
5 ac. grubbing orchards and vineyards	50.00	135.00	120.00
47,000 cu. yd. excav. for canal	.72	.62	.60
20,000 sta. cu. yd. overhaul	.02	.02	.02
1,500 cu. yd. compact embankments	.75	.23	.46
14,000 cu. yd. excav. for struct.	1.50	2.00	1.80
30,000 sq. yd. trim foundations for conc. lining	.65	.75	.60
10,000 cu. yd. backfill	.85	.54	1.25
7,000 cu. yd. compact backfill	2.25	2.90	3.00
875 cu. yd. conc. in struct.	78.00	82.00	101.00
1,500 cu. yd. conc. in canal lining	36.00	35.00	39.75
108,000 lb. placing reinf. bars	.06	.08	.06
100 sq. yd. dry-rock paving	10.00	10.00	8.00
19 M.B.M. erect timber in bridges	120.00	120.00	115.00
1 ea. constr. cattleguards	150.00	125.00	157.00
50 lin. ft. laying 15-in. diam. conc. pipe	1.85	1.50	1.25
600 lin. ft. laying 18-in. diam. conc. pipe	2.40	2.00	1.50
200 lin. ft. laying 24-in. diam. conc. pipe	3.50	3.00	1.90
30 lin. ft. laying 30-in. diam. conc. pipe	5.00	3.25	2.25
350 lin. ft. laying 12-in. diam. corr. metal pipe	1.50	1.30	.70
1,500 lb. install gates	.25	.16	.40
2,200 lb. install misc. metalwork	.40	.32	.50

SCHEDULE NO. 3	(1)	(2)	(3)
10 ac. clear orchards and vineyards	100.00	135.00	165.00
10 ac. grub orchards and vineyards	50.00	135.00	120.00
35,000 cu. yd. excav. for canal	.72	.62	.60
10,000 sta. cu. yd. overhaul	.02	.02	.02
1,500 cu. yd. compact embankments	.75	.23	.46
6,500 cu. yd. excav. for struct.	1.50	2.00	2.40
24,000 sq. yd. trim foundations for asph. lining	.65	.75	.60
15,000 sq. yd. apply organic soil sterilant	.06	.09	.09
9,000 sq. yd. apply inorganic soil sterilant	.08	.13	.09
6,000 cu. yd. backfill	.85	.54	1.25
3,400 cu. yd. compact backfill	2.25	2.90	3.00
440 cu. yd. conc. in struct.	78.00	82.00	105.00
28,700 sq. yd. asph. canal lining, except asphalt	2.00	2.00	3.00
245 tons furn. asph. for asphaltic lining	20.00	15.00	18.00
50,000 lb. placing reinf. bars	.06	.08	.06
200 sq. yd. dry-rock paving	10.00	10.00	8.00
44 M.B.M. erect timber in bridges	120.00	120.00	115.00
10 ea. constr. cattleguards	150.00	125.00	157.00
900 lin. ft. laying 15-in. diam. conc. pipe	1.85	1.50	1.25
960 lin. ft. laying 18-in. diam. conc. pipe	3.40	2.00	1.50
240 lin. ft. laying 24-in. diam. conc. pipe	3.50	3.00	1.90
170 lin. ft. laying 30-in. diam. conc. pipe	5.00	3.25	2.25
3,800 lb. install gates	.25	.16	.40
3,000 lb. install misc. metalwork	.40	.32	.50

Sewerage . . .

California—Los Angeles County—County—Joint Outfall

Steve P. Rados, Los Angeles, was low to the County Sanitation District No. 2 of Los Angeles, for the construction of Unit 1, Section 7 of Joint Outfall Sewer "B" from Florence Ave. to Washington Blvd. Approximately 16,000 lin. ft. of 57-in. and 63-in. reinforced concrete pipe will be furnished and installed. The total for Alternate "A" was $340,956 and Alternate "B", $336,088. The unit bids follow:

	Alt. "A"	Alt. "B"
(A) Steve P. Rados	$340,956	$336,088
(B) Martin Constr. Co.	347,948	.....
(C) Artukovich Bros.	349,583	344,989
(D) M. M. Buchanan	353,039	344,911
(E) Tom L. Gogo	363,643	357,407
(F) VCK Construction Co.	$382,385	.....
(G) Burch & Bebek	409,055	$405,152
(H) M. Miller Co.	461,454	455,399
(I) Bebek & Brkich	484,061	479,377

(1) 971 lin. ft. 63-in. reinf. conc. pipe sanit. sewer
  (a) using cent. R.C.P. 1300 D
  (b) precast R.C.P. 1300 D
(2) 2,791 lin. ft. 63-in. reinf. conc. pipe sanitary sewer
  (a) centr. R.C.P. 1200 D
  (b) precast R.C.P. 1200 D
(3) 1,448 lin. ft. 63-in. reinf. conc. pipe sanitary sewer
  (a) cent. R.C.P. 1000 D
  (b) precast R.C.P. 1000 D
(4) 24 lin. ft. 57-in. reinf. conc. pipe sanitary sewer
  (a) cent. R.C.P. 2500 D
  (b) precast R.C.P. 2500 D
(5) 1,905 lin. ft. 57-in. reinf. conc. pipe sanitary sewer with collars and cem. jts.
  (a) thick wall cent. R.C.P. 1800 D
  (b) thick wall precast R.C.P. 1800 D
(6) 2,720 lin. ft. 57-in. reinf. conc. pipe sanitary sewer
  (a) cent. R.C.P. 1500 D
  (b) precast R.C.P. 1500 D
(7) 5,753 lin. ft. 57-in. reinf. conc. pipe sanitary sewer
  (a) cent. R.C.P. 1000 D
  (b) precast R.C.P. 1000 D
(8) 21 ea. st. manholes, Type "B"
(9) 3 ea. st. junction chambers, Type "B"
(10) 100 cu. yd. of std. conc. bed
(11) 500 tons of gravel bed

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1a)	22.60	22.00	23.00	21.80	23.40	24.10	26.00	26.80	30.00
(1b)	22.30	.....	22.75	21.50	23.00	.....	25.75	26.50	29.70
(2a)	22.30	21.50	22.00	23.80	26.40	23.90	26.50	29.40	32.00
(2b)	22.00	.....	21.65	23.50	26.00	.....	26.25	29.00	31.70

(Continued on next page)

"OUR TRUCKS REALLY 'Hit the Ball' WITH OUR ML4 MOBILOADER DIGGING AND LOADING"

Ray R. Harden, County Engineer of Anderson County, Kansas, watches their new ML4 MobiLoader at work digging and loading from hard gravel-clay bank.

SPEED IS THE KEYNOTE on road projects. Time saved is money saved. That's why contractors and highway officials are "going for" the new ML4 MobiLoader!

Ray R. Harden, County Engineer of Anderson County, Kansas, enthusiastically says, "Our trucks really 'hit the ball' with our ML4 Athey MobiLoader digging and loading." Their ML4 MobiLoader digging and loading in hard material keeps eight trucks "humping it" eight to ten hours a day hauling gravel-clay mixture to county road jobs. Athey MobiLoaders, with the new "Finger-Tip" hydraulic control, dig and load faster because they provide straightline, overhead operation. They strip and load overburden; load gravel, sand and stone; load earth on highway construction, and many more profitable jobs. You'll be time and money ahead by replacing former digging and loading methods with the new ML4 MobiLoader. *Learn the complete story on this modern tractor-loader at your Athey-"Caterpillar" Dealer, or write direct to*

Athey APCOR Products

ATHEY PRODUCTS CORPORATION, 5631 West 65th St., Chicago 38, Illinois

Athey ML4 MOBILOADER

(3a)	22.00	21.00	21.00	20.80	24.40	23.80	26.00	31.20	30.00
(3b)	21.80	.....	20.85	20.50	24.00	.....	25.75	31.00	29.70
(4a)	26.20	26.00	50.00	60.00	30.00	128.30	50.00	95.25	35.00
(4b)	26.00	.....	50.00	60.00	30.00	.....	49.75	95.00	34.70
(5a)	23.90	21.00	27.00	21.80	24.40	26.70	25.00	35.50	35.00
(5b)	23.50	.....	26.60	21.50	24.00	.....	24.75	35.00	34.70
(6a)	19.75	22.00	20.00	21.80	20.10	22.40	25.00	24.40	29.00
(6b)	19.40	.....	19.65	21.50	19.70	.....	24.75	24.00	28.70
(7a)	19.30	21.00	18.60	20.80	19.70	22.00	25.00	27.40	28.00
(7b)	19.00	.....	18.35	19.90	19.30	.....	24.75	24.00	27.70
(8)	465.00	440.00	750.00	400.00	580.00	450.00	350.00	400.00	400.00
(9)	500.00	750.00	750.00	500.00	630.00	500.00	400.00	425.00	400.00
(10)	12.00	15.00	12.00	20.00	12.00	25.00	15.00	15.00	25.00
(11)	2.25	4.00	3.00	3.00	2.00	5.00	3.00	4.00	4.00

California—Marin County—City—Sewage Treatment Plant

Stolte, Inc., of Oakland, submitted the low bid of $152,467 (Alternate "A") to the City Council of Mill Valley and was awarded the contract for the construction of a sewage treatment plant, paving of access road, parking area, walkways and preparation of area around the pumping station for landscaping and appurtenances. The bid price for Alternate "B" was $151,807. The unit bids were submitted as follows:

	(A)	(B)		(A)	(B)
(1) Stolte, Inc.	$152,467	$141,807	(4) DeLucca & Son	$192,936	$190,324
(2) Fred J. Early Jr.	176,411	175,531	(5) Bebek & Brkich	198,050	197,500
(3) Hoagland-Findlay Engineering Co.	177,844	176,744	(6) Haas & Rothchild	207,569	207,019

	(1)	(2)	(3)	(4)	(5)	(6)
1 pumping station complete except the following: (a) mechanically cleaned bar screen and shredder mechanism; (b) detritor mechanism; (c) sump and raw sewage pumps; (d) ventilating exhaust fans; (e) electrical supply and control; (f) 4-in. cast iron water supply line; (g) fire hydrant, (h) pumping sta. discharge line to bay; (i) pile trestle for 30-in. line; (j) pumping station piping; (k) fill and grade; (l) paving of roads and walkways; (m) preparation for landscaping	$70,500	$83,315	$101,700	$115,793	$92,000	$104,931
1 ea. mech. cleaned bar screen and shredder mech.	$8,980	$7,947	$7,000	$9,222	$7,000	$9,873
1 ea. detritor mechanism	$7,920	$6,999	$5,900	$6,634	$6,500	$8,778
1 ea. vertical dry pit type ball bearing raw sewage pump of 500 gpm capacity	$1,360	829.00	$1,200	$1,468	$1,500	$1,660
1 ea. vert. dry pit type ball bearing raw sewage pump of 700 gpm capacity	$1,360	858.00	$0,000	$0,000	$1,500	$1,660
1 ea. vertical dry pit type ball and roller bearing raw sewage pump of variable capacity, 500 to 3,000 gpm., driven by a natural gas engine	$8,410	$8,221	$7,300	$7,347	$8,900	$9,626
2 ea. vertical dry pit type ball bearing raw sewage pumps of 1200 gpm. capacity	$2,030	$1,772	$2,000	$2,441	$1,500	$2,387
1 ea. sump pump	375.00	230.00	300.00	338.53	500.00	530.00
1 ea. exhaust vent. fan inst. of 2,200 cfm. capacity, including ducts, etc	690.00	849.00	330.00	695.26	800.00	600.00
1 ea. exhaust ventilating fan installation of 1,130 cfm. capacity, including ducts, etc	350.00	800.00	350.00	354.63	600.00	310.00
All elect. power, light and control circuits, switchboard, motor starting equip., lighting equip., switches, receptacles and appurtenances	$8,940	$9,259	$10,000	$7,810	$10,500	$9,020
725 lin. ft. 4-in. cast iron water line	2.30	4.60	2.00	3.73	4.00	5.24
1 ea. 4-in. fire hydrant with 1 hose connection and 4-in. gate valve	195.00	200.00	200.00	280.28	275.00	150.00
Alternate "A"						
550 lin. ft. 30-in. asbestos bonded paved invert, corrugated pipe from manhole "B" to bay	9.80	18.50	13.00	13.74	20.00	27.50
Alternate "B"						
550 lin. ft. 24-in. asbestos bonded paved invert, corrugated pipe from manhole "B" to bay	8.60	16.90	11.00	9.00	19.00	26.50
48 lin. ft. pile trestle	45.00	59.00	38.00	75.96	200.00	66.00
Lump sum, pumping station piping, valves, hose bibbs, fittings, manholes and appurtenances	$22,600	$23,815	$19,500	$14,048	$20,000	$23,912
5,700 cu. yd. imported material	.90	1.75	1.20	1.22	2.75	1.45
Lump sum, paving of access road, parking area and walkways	$3,880	$4,000	$3,100	$3,614	$5,000	$3,475
Lump sum, preparation area around the pumping station for landscaping	530.00	$1,000	500.00	500.00	$1,800	300.00

Airports . . .

California—San Mateo County—City and County—Extension Fill

Guy F. Atkinson Co. of South San Francisco submitted the low bid of $3,722,310 to the City and County Public Utilities Commission, San Francisco, and was awarded the contract for the construction of fills to reclaim tidelands, water areas and other low-lying ground adjacent to the already developed area of the airport and to raise grades and lay drain pipes. In Proposition "A" the fill material is to be placed in a dry condition. In Proposition "B" the fill material may be a hydraulic fill of sand, some dry fill will be required to cover the sand. Proposition "C" covers the entire work in both preceding sections. The unit bid prices are:

	Proposition A	Proposition B	Proposition C
(1) Guy F. Atkinson Co.	$1,922,360	.....	$3,722,310
(2) Macco Corp. & Morrison-Knudsen Co., Inc.	.....	.....	3,904,229
(3) Construction Aggregates Corp.	.....	$1,990,220	.....

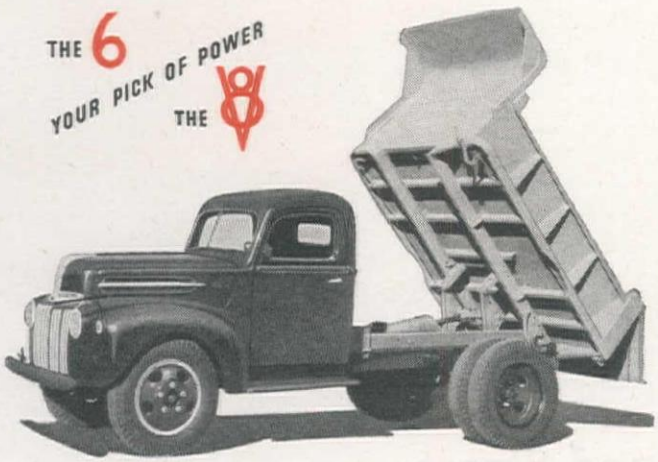
PROPOSITION A	(1)	(2)	(3)
2,600,000 cu. yd. fill constr., dry placed	.60	.....	.....
375,000 cu. yd. compact to 95% density	.082	.....	.....
45,000 M. gal. watering	1.20	.....	.....
95,000 cu. yd. rehandling fill matl.	.32	.....	.....
35,000 cu. yd. leveling and benching	.25	.....	.....
200,000 cu. yd. excav. and removal of unsuitable matl.	.50	.....	.....
10,000 cu. yd. canal excav.	.16	.....	.....
8,800 ton rock facing	2.50	.....	.....
110,000 sq. yd. subbase prep.	4.00	.....	.....
10,000 ton crushed rock base	2.00	.....	.....
4,700 sq. yd. removing exist. conc. pavement	.55	.....	.....

(Continued on next page)

"WE AGREE— FORD TRUCKS LAST LONGER!"

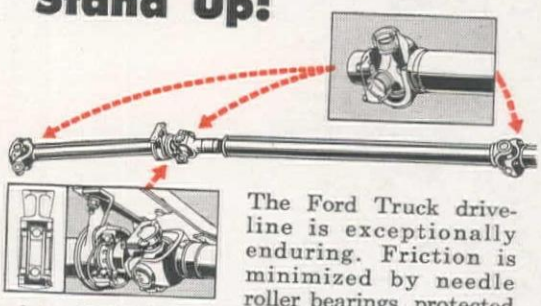
Mr. Robert S. Swanson, treasurer, S. B. Thomas, Inc., Long Island City, N. Y., wrote recently: "In our fleet of 128 Ford Trucks, 36 are over 10 years old, and 6 are 1932 models—14 years old! Their reliability and economy have given us good reason to be thankful that Ford Trucks Last Longer."

THE 6 YOUR PICK OF POWER THE V-8



Tens of thousands of Ford Trucks have proved their endurance in the tough service of handling bulk building materials, ores, earth and coal. This 2-ton Dump Truck chassis carries a 3- to 4-yard heavy duty body and hoist by St. Paul Hydraulic Hoist Division of Gar Wood Industries, Minneapolis, Minnesota.

ONE Big Reason— Ford Drive-Line Units Stand Up!



The Ford Truck drive-line is exceptionally enduring. Friction is minimized by needle roller bearings, protected by relief fittings, in all universal joints in all models. Half-ton chassis have two such joints. All other models (except 101" w.b.) have three, and, in addition, a heavy duty ball center bearing. This bearing is self-aligning—cushion-mounted in live rubber. It is leakproof, excluding dust and water. It is unaffected by frame flexing and is notably long-lived. Large-diameter tubular steel propeller shafts with forged ends are properly balanced. This assures freedom from destructive vibration and great strength without excess weight.

Ford

ONLY FORD GIVES YOU ALL THESE LONG-LIFE TRUCK FEATURES: Either of two great engines, the V-8 or the SIX, both with full pressure lubrication to all main, connecting-rod and camshaft bearings, Flightlight oil-saving 4-ring pistons, precision-type heat-resistant bearings and fast-warmup temperature control • rear axle design that takes all weight load off the shafts (¾-floating in half ton units, full-floating in all others) • heavy channel section frames, *doubled* between springs in heavy duty models • big, self-centering brakes, with heavy, cast drum surfaces, non-warping and score-resistant—all told, *more than fifty* such examples of Ford endurance-engineering.

NATURALLY, FORD TRUCKS LAST LONGER! Latest 1946 registration figures show that 78% of all 1936 model Ford Trucks in use 9 years ago are still on the job! That's up to 15.8% better than the records of the next four sales leaders—5% better than the average of all four. More than 100 body-chassis combinations. See your Ford Dealer!

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE

9,500 cu. yd. trench, minor struct. excav. and backfill	2.10	.....	.....
220,000 sq. yd. fine grading of inlet pond. area	.025	.....	.....
3,200 lin. ft. furn. and lay 12-in. standard strength reinf. conc. pipe	1.85	.....	.....
1,150 lin. ft. furn. and lay 15-in. standard strength reinf. conc. pipe	2.20	.....	.....
200 lin. ft. furn. and lay 18-in. standard strength reinf. conc. pipe	2.75	.....	.....
1,150 lin. ft. furn. and lay 21-in. standard strength reinf. conc. pipe	3.60	.....	.....
500 lin. ft. furn. and lay 24-in. standard strength reinf. conc. pipe	4.50	.....	.....
1,200 lin. ft. furn. and lay 27-in. standard strength reinf. conc. pipe	4.85	.....	.....
2,000 lin. ft. furn. and lay 30-in. standard strength reinf. conc. pipe	5.25	.....	.....
2,150 lin. ft. furn. and lay 33-in. standard strength reinf. conc. pipe	6.30	.....	.....
200 lin. ft. furn. and lay 36-in. standard strength reinf. conc. pipe	8.90	.....	.....
100 lin. ft. furn. and lay 21-in. corr. metal pipe	3.65	.....	.....
1,000 lin. ft. furn. and lay 24-in. corr. metal pipe	3.75	.....	.....
200 lin. ft. furn. and lay 36-in. corr. metal pipe	7.35	.....	.....
100 lin. ft. furn. and lay 48-in. corr. metal pipe	11.50	.....	.....
100 lin ft. lay 24-in. corr. pipe furn. by city	1.30	.....	.....
1 ea. furn. and install 21-in. automatic drain. gate	45.00	.....	.....
1 ea. furn. and install 24-in. automatic drain. gate	55.00	.....	.....
1 ea. install 24-in. automatic gate furn. by city	25.00	.....	.....
100 lin. ft. remove 24-in. corr. metal pipe	1.75	.....	.....
100 cu. yd. conc. for drainage inlets and minor structs	65.00	.....	.....
5,000 lb. reinf. steel in struct	.12	.....	.....
6,800 lb. inlet grating and supporting angles	.35	.....	.....
2,000 lin. ft. reconst. right-of-way fence	.60	.....	.....
PROPOSITION B			
2,400,000 cu. yd. fill construct	.....	.....	.70
50,000 cu. yd. compaction to 95% density	.....	.....	.16
5,000 M. gal. watering	.....	.....	2.00
5,000 cu. yd. rehandling fill material	.....	.....	.40
25,000 cu. yd. leveling and benching	.....	.....	.50
25,000 cu. yd. excav. and removal of unsuitable material	.....	.....	.50
16,200 tons rock facing	.....	.....	6.00
PROPOSITION C			
5,000,000 cu. yd. fill construction	.657	.67	.....
425,000 cu. yd. compaction to 95% density	.082	.20	.....
50,000 M. gallons watering	1.23	1.50	.....
100,000 cu. yd. rehandling fill material	.32	.25	.....
60,000 cu. yd. leveling and benching	.25	.15	.....
225,000 cu. yd. excav. and removal of unsuitable material	.50	.64	.....
10,000 cu. yd. canal excav.	.16	.30	.....
25,000 ton rock facing	2.60	2.75	.....
110,000 sq. yd. subbase prep.	.04	.10	.....
10,000 tons crushed rock base	2.00	2.35	.....
4,700 sq. yd. removing existing concrete pavement	.55	1.00	.....
9,500 cu. yd. trench and minor struct. excav. and backfill	2.10	3.20	.....
220,000 sq. yd. fine grading of inlet ponding area	.025	.05	.....
3,200 lin. ft. furn. and lay 12-in. standard strength reinf. conc. pipe	1.85	1.70	.....
1,150 lin. ft. furn. and lay 15-in. standard strength reinf. conc. pipe	2.20	2.00	.....
200 lin. ft. furn. and lay 18-in. standard strength reinf. conc. pipe	2.75	2.60	.....
1,150 lin. ft. furn. and lay 21-in. standard strength reinf. conc. pipe	3.60	3.40	.....
500 lin. ft. furn. and lay 24-in. standard strength reinf. conc. pipe	4.50	4.40	.....
1,200 lin. ft. furn. and lay 27-in. standard strength reinf. conc. pipe	4.85	5.00	.....
2,000 lin. ft. furn. and lay 30-in. standard strength reinf. conc. pipe	5.25	5.50	.....
2,150 lin. ft. furn. and lay 33-in. standard strength reinf. conc. pipe	6.30	6.60	.....
200 lin. ft. furn. and lay 36-in. standard strength reinf. conc. pipe	8.90	8.00	.....
100 lin. ft. furn. and lay 21-in. corr. metal pipe	3.65	3.20	.....
1,000 lin. ft. furn. and lay 24-in. corr. metal pipe	3.75	4.30	.....
200 lin. ft. furn. and lay 36-in. corr. metal pipe	7.35	7.70	.....
100 lin. ft. furn. and lay 48-in. corr. metal pipe	11.50	12.00	.....
100 lin. ft. lay 24-in. corr. pipe furn. by city	1.30	2.20	.....
1 ea. furn. and install 21-in. automatic drain. gate	45.00	50.00	.....
1 ea. furn. and install 24-in. automatic drain. gate	55.00	50.00	.....
1 ea. install 24-in. automatic gate furn. by city	25.00	50.00	.....
100 lin. ft. remove 24-in. corr. metal pipe	1.75	1.50	.....
100 cu. yd. conc. for drain inlets and minor struct.	65.00	90.00	.....
5,000 lb. reinf. steel in structs.	.12	.14	.....
6,800 lb. inlet grating and supporting angles	.35	.30	.....
2,000 lin. ft. reconst. right-of-way fence	.60	.40	.....

Highway and Street . . .

California—Los Angeles County—State—Grade & Surf.

Clyde W. Wood, Inc., North Hollywood, Calif., submitted the lowest bid of $763,297 to the Division of Highways at Sacramento, for about 2.6 mi. of grading and surfacing with plant mixed surface on untreated rock base on Rt. 4, Sec. G, between Palomas Creek and Violin Saddle. The unit bids were as follows:

(A) Clyde W. Wood, Inc. $763,297
(B) A. Teichert & Son, Inc. 834,593
(C) C. G. Willis & Sons 911,282
(D) James I. Barnes Construction Co. 934,050
(E) R. A. Bell & A. F. Heinze 995,112
(F) Morrison-Knudsen Co., Inc. $1,026,021
(G) Bressi-Bevanda Constructors, Inc. 1,030,889
(H) Vinnell Co. 1,034,201
(I) N. M. Ball Sons 1,083,228

(1) 900 cu. yd. rem. conc.
(2) 139 sta. clear and grub
(3) 700,000 cu. yd. roadway excav.
(4) 2,900 cu. yd. struct. excav.
(5) 1,600 cu. yd. ditch and channel excav.
(6) 3,700,000 sta. yd. overhaul
(7) 77,000 sq. yd. compacting orig. ground
(8) 35,000 cu. yd. pervious material
(9) 60,000 tons imported borrow
(10) lump sum, dev. water sup. & furn. wat. equip.
(11) 25,000 M. gal. applying water
(12) 139 sta. finishing roadway
(13) 40,000 tons untreated rock base
(14) 27,000 tons P.M.S.
(15) 350 tons P.M.S. (channel lining)
(16) 125 tons liquid asphalt SC-2 (pr. ct.)
(17) 70 tons asphaltic emulsion (sl. ct.)
(18) 410 tons screenings (sl. ct.)
(19) 4,600 lin. ft. raised bars
(20) 270 cu. yd. Cl. "A" P.C.C. (structures)
(21) 10,000 lbs. bar reinf. steel
(22) 8,500 lbs. railroad rails
(23) 800 lin. ft. 8-in. C.M.P. down drains (16 ga.)
(24) 135 lin ft. 18-in. C.M.P. down drains (14 ga.)
(25) 1,795 lin. ft. 24-in. C.M.P. down drains (12 ga.)
(26) 762 lin. ft. 30-in. C.M.P. down drains (8 ga.)
(27) 820 lin. ft. 6-in. std. drain tile
(28) 6 ea. spillway assemblies
(29) 1,000 lin. ft. salv. exist. spillway assembly down drains
(30) 1,000 lin. ft. relaying salv. C.M. spillway assembly down drains
(31) 12 ea. salv. spillway assemblies
(32) 12 ea. install salv. spillway assemblies
(33) 1 mi. new prop. fence
(34) 5 mi. rem. and reconst. exist. prop. fences
(35) 4 ea. drive gates, 14-ft. wide
(36) 24 ea. drive gates 10-ft. wide
(37) lump sum, engineers offices

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	5.00	6.50	2.60	3.00	10.00	2.50	3.50	3.00	4.00
(2)	20.00	26.00	144.00	25.00	50.00	33.00	55.00	140.00	70.00
(3)	.465	.43	.515	.63	.66	.794	.68	.78	.82
(4)	3.50	3.20	2.50	2.50	3.00	3.00	2.50	1.85	2.75
(5)	1.00	2.00	2.00	1.00	1.50	1.00	1.40	1.50	2.75

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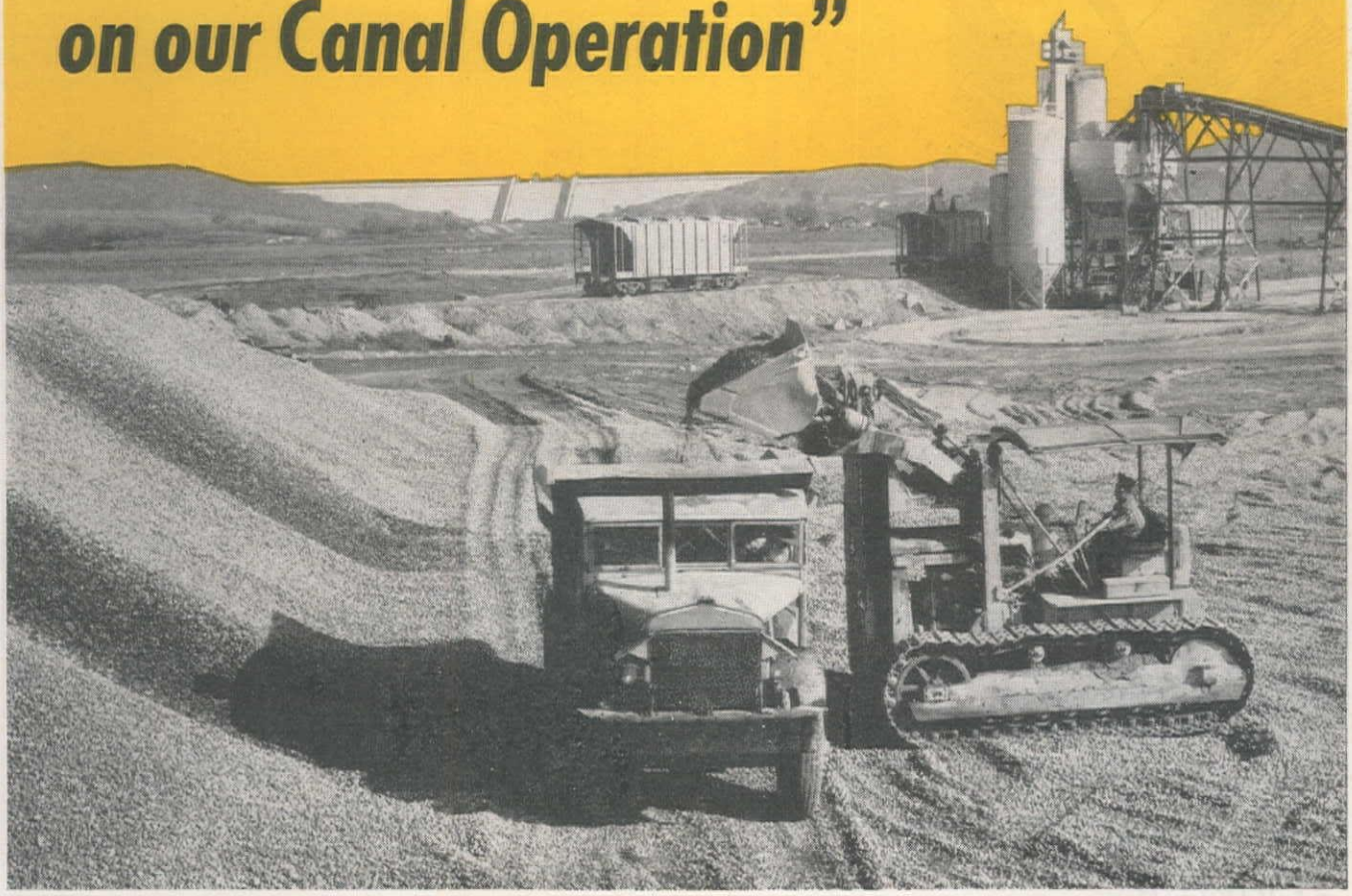
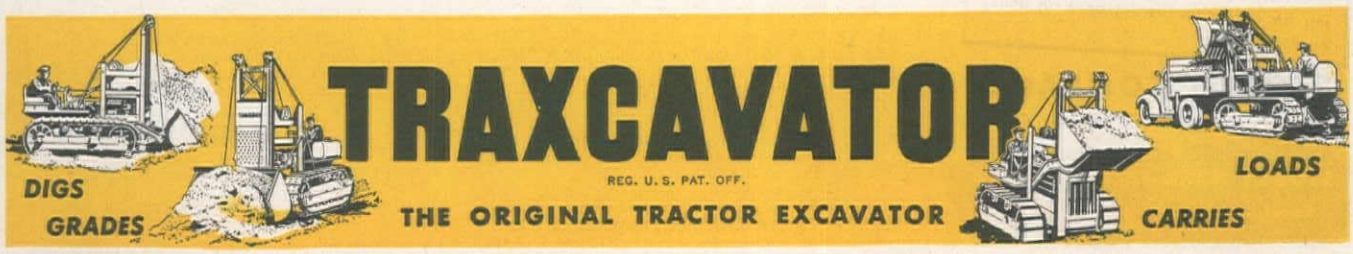
"This TRAXCAVATOR *is the* Key Machine on our Canal Operation"



IN the shadow of Friant Dam, Peter Kiewit Sons Company has set up an 80-cubic-yard-per-hour concrete batching plant for lining their section of the huge Friant-Kern canal. Their T-7 TRAXCAVATOR loads all of the aggregate used—four sizes of rock, gravel and sand—into 10-yard trucks. Keith Wasson, superintendent says, "This TRAXCAVATOR is the *key machine* on our canal operation." The T-7 was also used for preliminary excavating work on the canal and for many necessary clean-up jobs.

TRAXCAVATORS are built in four sizes — for every job and purpose — with bucket capacities from ½ to 4 cubic yards. Powered by "Caterpillar" track-type tractors, these multi-purpose machines do more work on more jobs with more real savings in time and money than any other single machine you could own. TRAXCAVATORS are virtually one-machine gangs on most every kind of earth-moving and material-handling operation.

Your TRACKSON-"Caterpillar" dealer will gladly show you why TRAXCAVATORS "ring the bell" with profit-minded, production-geared construction men. See him today, or write direct to TRACKSON COMPANY, Department WC-57, Milwaukee 1, Wisconsin.



(6)	.005	.01	.005	.005	.01	.01	.004	.01	.007
(7)	.08	.05	.09	.07	.10	.05	.06	.05	.03
(8)	1.10	1.70	1.84	1.60	1.30	1.35	1.70	1.35	1.70
(9)	1.00	1.10	1.57	1.60	1.48	1.00	1.50	.90	1.57
(10)	$7,500	$30,000	$18,027	$3,500	$25,000	$2,400	$25,000	$25,000	$3,000
(11)	2.00	1.50	2.00	2.00	1.50	2.00	1.50	2.00	1.70
(12)	15.00	15.00	10.00	15.00	15.00	27.00	50.00	10.00	10.00
(13)	1.35	2.00	1.81	2.00	1.60	1.60	1.90	1.65	1.88
(14)	4.10	4.75	4.47	4.00	5.25	4.25	5.25	4.00	4.30
(15)	20.00	8.50	9.50	6.00	6.50	6.25	15.00	6.50	10.00
(16)	15.00	22.00	20.00	13.50	20.00	20.00	17.00	27.00	14.00
(17)	20.00	30.00	21.00	19.50	35.00	29.00	22.00	18.00	20.00
(18)	4.00	6.50	4.20	5.00	6.00	4.60	6.00	5.00	6.00
(19)	.50	.85	.80	1.00	.60	.60	1.75	1.10	.40
(20)	70.00	70.00	75.00	60.00	70.00	63.00	75.00	55.00	55.00
(21)	.10	.10	.15	.09	.10	.12	.12	.11	.10
(22)	.15	.10	.10	.06	.10	.07	.06	.07	.06
(23)	3.00	1.50	2.00	1.75	1.75	1.60	1.80	1.50	2.10
(24)	4.00	3.20	3.50	3.90	2.75	3.00	3.25	3.00	3.50
(25)	5.50	5.60	5.50	4.50	3.75	5.65	5.50	5.00	6.00
(26)	10.00	10.00	9.50	8.80	5.00	10.00	9.00	9.50	10.50
(27)	1.00	1.00	.50	1.40	2.00	1.00	1.00	.60	1.30
(28)	30.00	25.00	32.00	30.00	30.00	24.00	25.00	25.00	32.00
(29)	1.00	.70	.60	.75	1.00	1.00	.60	.60	1.00
(30)	1.00	1.00	1.20	.75	1.00	2.00	1.00	.50	1.60
(31)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	12.00	5.00
(32)	15.00	15.00	20.00	10.00	10.00	16.00	10.00	13.00	16.00
(33)	$2,000	$1,600	$2,000	$1,200	$1,500	$2,250	$2,000	$2,000	$1,600
(34)	$1,000	$1,000	$1,500	900.00	500.00	$2,000	$1,700	$1,600	$1,200
(35)	100.00	60.00	100.00	50.00	50.00	65.00	95.00	90.00	70.00
(36)	75.00	50.00	75.00	40.00	40.00	45.00	75.00	75.00	50.00
(37)	$3,000	$2,000	$2,496	$2,500	$2,000	$2,600	$3,000	$3,200	$2,000

Washington—King County—State—Grade and Substruct.

N. Fiorito Co., Seattle, Wash., was awarded a $302,740 contract by the Department of Highways at Olympia for approx. 3.9 miles of clearing, grubbing, grading, ballasting, surfacing and construction of concrete piers and abutments for a railway bridge on Secondary State Hwy. 3-A, Kennydale to Bellevue, Section 1. The following unit bids were submitted:

(1) N. Fiorito Co. $302,740
(2) Northwest Construction Co. 312,669
(3) J. P. Surace Co. $321,966
(4) Erickson Paving Co. 327,596

		(1)	(2)	(3)	(4)
50.5	acres clearing	300.00	225.00	300.00	300.00
31.6	acres grubbing	300.00	275.00	300.00	300.00
434,730	cu. yd. unclass. excav. incl. haul of 600 ft.	.26	.27	.26	.29
1,170	cu. yd. com. tr. excav. incl. haul of 600 ft.	3.00	2.00	1.50	1.50
324,210	cu. yd. stas. overhaul on above materials	.015	.01	.02	.01
1480.60	M. cu. yd. stas. overhaul on above materials	5.00	5.00	5.00	5.00
1,645	cu. yd. struct. excav.	3.00	2.50	3.00	4.00
22,750	lin. ft. slope treatment	.15	.15	.15	.16
212.5	stas. (100 ft.) finishing roadway	15.00	15.00	10.00	15.00
42,020	cu. yd. sel. rdy. borrow in place incl. haul	.65	.60	.70	.85
4,230	cu. yd. one cse. scr. gravel surf. in place	1.40	2.50	1.85	1.85
3,150	cu. yd. sand filler in place incl. haul	1.40	2.00	1.85	1.85
202	M. gal. water	2.00	3.00	3.00	2.00
480	cu. yd. gravel backfill in place	5.00	4.00	2.25	5.00
4,170	cu. yd. screened gravel surf. in stockpile	1.00	2.25	1.85	1.85
334	cu. yd. conc. Class A in place	60.00	59.00	60.00	62.00
1	cu. yd. conc. Class C in place	25.00	75.00	35.00	25.00
58,710	lb. steel reinf. bars in place	.12	.09	.09	.09
163	only, reinf. conc. r/w markers in place	4.00	3.00	3.50	3.50
2	only, reinf. conc. Fed. Aid markers in place	25.00	20.00	15.00	15.00
80	cu. yd. hand placed riprap in place	15.00	20.00	20.00	7.00
4	cu. yd. mortar rubble masonry in place	30.00	45.00	25.00	40.00
410	sq. yd. remove exist. conc. pavemt.	1.00	1.50	1.50	3.00
2,057	lin. ft. remove exist. guard rail	.50	.60	.40	.25
16	only, remove exist. conc. and rubble mason, hdrs.	20.00	25.00	15.00	5.00
Lump sum,	remove exist. wingwalls	.....	.....	.....	.....
199	lin. ft. relaying iron water pipe, ¾-in. diam.	1.00	.65	.75	.75
58	lin. ft. relaying iron water pipe, 1-in. diam.	1.00	1.00	.85	.85
81	lin. ft. relaying conc. pipe, 12-in. diam.	1.80	1.25	1.65	.75
66	lin. ft. relaying conc. pipe, 18-in diam.	2.80	2.00	2.25	1.25
30	lin. ft. galv. iron water pipe, ¾-in. diam., in place	1.00	.75	.60	1.50
606	lin. ft. galv. iron water pipe, 1-in. diam., in place	1.00	1.00	.75	1.55
20	lin. ft. half rnd. corr. met. splwy, 18-in. diam., in place	2.00	2.50	1.75	1.92
456	lin. ft. bit. ct. corr. met. culv. pipe T. 2.16-ga. 12-in. diam., in pl.	2.25	2.25	2.30	2.09
15	lin. ft. bit. ct. corr. met. culv. pipe T. 2.16-ga. 15-in. diam., in pl.	2.60	2.50	3.00	2.52
823	lin. ft. bit. ct. corr. met. culv. pipe T. 2.16-ga. 18-in. diam., in pl.	2.90	2.75	3.00	3.00
283	lin. ft. pl. conc. or V.C. sewer pipe, 6-in. diam., in pl.	.51	.75	1.00	.90
850	lin. ft. pl. conc. or V.C. drain pipe, 8-in. diam., in pl.	.60	1.00	1.25	1.10
375	lin. ft. pl. conc. or V.C. culv. pipe, 12-in. diam., in pl.	1.05	1.50	1.75	1.35
1,068	lin. ft. std. reinf. conc. culv. pipe, 18-in. diam., in pl.	2.50	2.75	1.75	2.65
849	lin. ft. std. reinf. conc. culv. pipe, 24-in. diam., in pl.	4.00	4.00	4.00	3.40
	UNDERCROSSING SUBSTRUCTURE				
900	cu. yd. struct. excav.	2.50	5.10	8.50	3.00
1,000	cu. yd. conc., Class F, in place	36.00	37.50	42.50	35.00
35,000	lb. steel reinf. bars, in place	.10	.08	.08	.09
1,800	lin. ft. furnish timber pile (untreat.) at site	.35	.40	.40	.50
52	only, driving timber pile (untreat.) in pl.	55.00	61.00	61.00	40.00
60	sq. yd. membrane waterproofing, in place	3.50	5.50	5.50	2.00
28	M.B.M. timber and lumber (untreated) in place	160.00	176.00	210.00	200.00

Oregon—Washington and Yamhill Counties—State—Surf. and Oil

O. C. Yocom of McMinnville, Ore., submitted the lowest bid of $103,736 to the Oregon State Highway Commission at Salem for 7.9 mi. of surfacing and oiling of the Schools-Newberg Section of the Hillsboro-Silverton Secondary Highway. The project requires approximately 34,300 cu. yd. of crushed rock or crushed gravel; and 420 tons of asphaltic materials. The unit bids are as follows:

(A) O. C. Yocom $103,736
(B) J. N. & M. J. Conley 107,371
(C) Porter W. Yett 109,327
(D) Rogers Construction Co. 109,862
(E) E. H. Itschner 110,070
(F) A. H. Saxton & Sons $111,376
(G) Homer G. Johnson 113,532
(H) R. O. Dail 118,423
(I) Sound Construction & Engineering Co. 133,002

(1) 25,000 cu. yd. 2½-in. - 0 matl. in base
(2) 5,300 cu. yd. ¾-in. - 0 matl. in base and shldrs.
(3) 700 M. gal. sprinkling
(4) 7.91 mi. preparation of base
(5) 900 cu. yd. ¾-in. - 0 matl. in binder crse.
(6) 3,100 cu. yd. furn. and place aggregates
(7) 100 ton furn. and place RC-3 or emuls. asph. in seal coat
(8) 150 ton furn. and place RC-3 asph. in binder course
(9) 170 ton furn. and place 151-200 asph.

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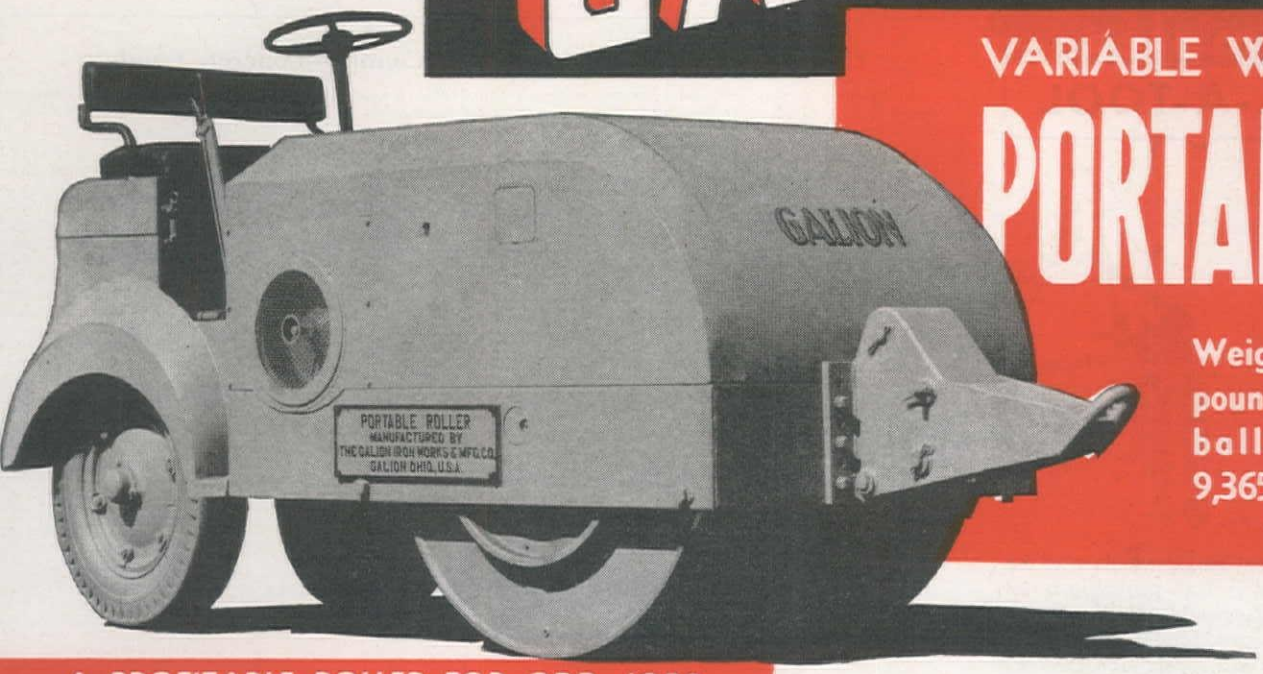
GALION

VARIABLE WEIGHT PORTABLE

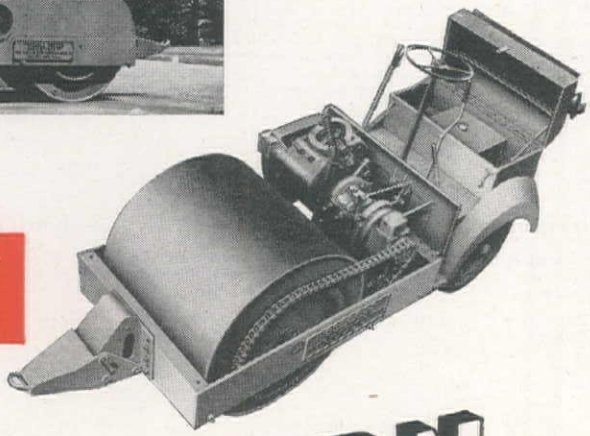


Weight 6,700 pounds, water ballasted to 9,365 pounds.

A PROFITABLE ROLLER FOR ODD JOBS

TRANSPORTS LIKE A TRAILER

PATCHING, MAINTENANCE, or NEW WORK



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General and Export Sales Office
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hydraulic

GRADERS · ROLLERS

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	2.48	2.45	2.50	2.60	2.56	2.65	2.60	2.80	3.25
(2)	2.48	2.70	2.50	2.60	2.56	2.75	2.75	2.80	3.85
(3)	2.50	2.50	3.00	3.00	3.00	3.00	3.00	3.00	2.75
(4)	200.00	200.00	135.00	200.00	200.00	100.00	200.00	300.00	200.00
(5)	3.50	4.00	3.50	3.70	3.90	4.00	4.00	4.00	4.25
(6)	3.50	4.00	5.00	3.70	4.10	4.00	4.00	4.00	4.25
(7)	26.00	28.70	28.00	30.00	30.00	27.00	35.00	30.00	25.00
(8)	26.00	28.70	28.00	30.00	30.00	28.00	35.00	30.00	25.00
(9)	28.00	31.20	28.00	30.00	30.00	28.00	32.50	33.00	27.00

Waterway Improvement . . .

California—Los Angeles County—County—Concrete Conduit

A. Teichert & Son, Inc., Sacramento, with a bid of $418,810 was low before the County Board of Supervisors in Los Angeles for the construction of a concrete conduit in the Arroyo Seco Channel, between Colorado Street and La Loma Ave., Pasadena. Unit bids were as follows:

(1) A. Teichert & Son.....$418,810
(2) MacDonald & Kruse and Hensler Construction Co..... 459,105
(3) Macco Corp. $499,933
(4) Guy F. Atkinson Co..... 546,069

	(1)	(2)	(3)	(4)
80 cu. yd. remove conc. from dam	30.00	20.00	4.70	20.00
65 cu. yd. remove conc. from apron	25.00	20.00	3.80	17.00
2,050 cu. yd. spillway excav., "A"	.70	2.00	.65	4.00
300 cu. yd. spillway excav., "B"	18.00	10.00	3.60	6.00
280 cu. yd. trail excav.	4.00	3.00	1.20	2.00
15 cu. yd. bedrock excav.	20.00	12.00	10.00	20.00
5 cu. yd. spillway cutoff excav.	4.00	3.00	3.00	7.00
3,670 cu. yd. fill and backfill	.40	1.00	.45	1.00
1,700 cu. yd. compact fill	2.50	3.00	2.00	4.00
400 squares ea., addl. roller trip	.20	.10	.05	.10
325 lin. ft. furn. and place 6-in. conc. pipe	1.60	4.00	1.60	2.50
45 lin. ft. furn. and place 8-in. conc. pipe	2.00	4.25	1.45	2.75
92 lin. ft. furn. and place 10-in. conc. pipe	2.00	4.50	1.65	3.00
Lump sum, alter well box, No. 1	150.00	300.00	100.00	325.00
25 lin. ft. 8-in. drain from well box No. 1	5.00	9.00	5.00	5.00
50 lin. ft. 8-in. drain from well box No. 2	5.00	9.00	6.00	6.00
360 cu. yd. conc. W. spillway wall	30.00	40.00	24.00	38.00
960 cu. yd. conc. E. spillway	30.00	40.00	23.00	29.00
180 cu. yd. conc. in E. spillway wall	20.00	40.00	12.50	25.00
31,000 lb. place reinf. in spillway walls	.03	.04	.05	.025
60 cu. yd. conc. cutoff wall at dam toe	40.00	60.00	27.00	23.00
2 cu. yd. conc. cutoff wall, Sta. 348	50.00	40.00	42.00	50.00
100 cu. yd. conc., spillway crest	25.00	35.00	27.00	30.00
145 cu. yd. conc., spillway floor 12-in. slab	25.00	25.00	23.00	24.00
200 cu. yd. conc., spillway floor 18-in. slab	25.00	25.00	25.00	26.00
16 lin. ft. drill 2-in. weep holes in rock	2.00	1.50	.60	2.50
425 lin. ft. drill holes, grout steel dowels	2.40	2.00	.85	1.50
330 lin. ft. drill, furn. and place spillway wall fence	2.00	2.00	2.00	2.25
125 lin. ft. place copper water seals	2.00	1.25	1.20	2.00
2,650 bbl. furn. cement	2.50	2.50	2.80	2.50
54,700 cu. yd. conduit excav., "A"	.50	.72	.30	1.00
6,000 cu. yd. conduit excav., "B"	1.00	4.50	2.10	5.00
1,600 cu. yd. channel excav., "A"	.30	.72	.45	.60
200 cu. yd. channel excav., "B"	1.00	4.20	1.20	6.50
200 cu. yd. cutoff wall excav., "A"	2.00	2.00	1.75	8.00
1,000 cu. yd. downstream cutoff, "A"	2.00	1.50	1.20	5.50
5 cu. yd. downstream cutoff, "B"	7.00	6.00	6.00	15.00
200 cu. yd. bedrock excav.	18.00	8.00	10.00	25.00
990 cu. yd. R.C. invert slab, center	20.00	18.00	25.00	22.00
1,985 cu. yd. R.C. invert slab, sides	18.00	15.00	23.00	16.00
3,150 cu. yd. R.C. wall bases	19.00	15.00	23.00	23.00
2,375 cu. yd. R.C. wall stems	36.00	45.00	70.00	52.00
13 cu. yd. R.C. spread footing	28.00	30.00	34.00	40.00
19 cu. yd. R.C. abutment footing	40.00	30.00	38.00	39.00
42 cu. yd. R.C. abutment wall	45.00	60.00	50.00	64.00
84 cu. yd. R.C. bridge deck	50.00	70.00	68.00	66.00
10 cu. yd. R.C. bridge curb	70.00	40.00	48.00	66.00
75 cu. yd. R.C. typical cutoff walls	45.00	25.00	62.00	79.00
77 cu. yd. R.C. downstream cutoff walls	35.00	30.00	40.00	38.00
10 ea. drain outlet boxes	150.00	150.00	200.00	200.00
6 ea. drain inlets	$1,000	150.00	750.00	$1,400
2 ea. 18-in. drain pipe inlets	10.00	450.00	13.00	24.00
7,992 lin. ft. furn. and place 6-in. conc. pipe sidedrains	1.50	1.00	.90	1.25
1,305 lin. ft. furn. and place 6-in. conc. pipe center drains	1.80	1.10	1.60	2.25
4,460 lin. ft. furn. and place 6-in. conc., lateral drains	1.90	1.10	1.80	2.50
900 lin. ft. furn. and place 8-in. conc. subdrains	2.00	1.25	1.45	2.50
1,670 lin. ft. furn. and place 10-in. conc. subdrains	2.10	1.50	1.65	3.00
Lump sum, furn. and place bridge fence	220.00	300.00	240.00	273.00
Lump sum, furn. and place bridge rail	600.00	$1,000	500.00	990.00
7,964 lin. ft. furn. and place fence on conduit walls	1.00	1.00	.90	.80
Lump sum, furn. and place riprap and rock fill	700.00	$2,000	$1,600	$1,700
13,200 bbl. furn. cement	2.50	2.50	2.80	2.50

Oregon—Multnomah County—P. R. A.—Embankment

Hydraulic Dredging Co., Ltd., Oakland, Calif., was low before the Public Roads Administration, Portland, with a bid of $823,734 for hydraulic dredged embankment along the bank of the Columbia River about 20 miles east of Portland. The following unit bids were submitted:

(1) Hydraulic Dredging Co., Ltd.....$824,734
(2) Johnson Western Co..... 835,081
(3) Franks Dredging Co.....$ 927,178
(4) General Construction Co..... 1,034,387

	(1)	(2)	(3)	(4)
Lump sum, extra and misc. work	$1,000	$1,000	$1,000	$1,000
48 acres clearing	500.00	500.00	450.00	500.00
2 acres grubbing	500.00	400.00	620.00	500.00
23,000 cu. yd. unclass. excav. (channel changes)	.75	.65	.92	1.50
3,250 cu. yd. unclass. excav., for structs.	5.00	3.80	3.00	4.00
116,000 cu. yd. unclass. excav. for borrow, case 1	.75	.75	.92	.80
2,023,000 cu. yd. unclass. excav., for borrow, case 1 (hydraulic embank.)	.248	.27	.297	.33
1,246,000 sta. yd. overhaul (1,000 ft. free haul)	.01	.0075	.008	.02
116,000 cu. yd. spec. overhaul of borrow (1,000 ft. free haul)	.25	.20	.18	.25
300 cu. yd. foundation fill	5.00	4.00	6.15	6.00
1,510 cu. yd. conc., Class "A"	60.00	50.00	59.00	62.50
196,000 lb. reinf. steel	.10	.08	.09	.10
318 lin. ft. 18-in. std. str. reinf. conc. culv. pipe	4.75	3.50	3.20	4.00
466 lin. ft. 24-in. ex. str. reinf. conc. culv. pipe	6.45	4.50	4.80	5.00
94 lin. ft. 84-in. bitum. ctd. corr. S. M. culv. pipe, type 1	41.00	44.00	36.70	50.00
15,000 cu. yd. furn. and pl. loamy topsoil	1.00	1.00	1.25	1.50


PACIFIC
SUPER STEEL
PREFORMED
WIRE ROPE
PACIFIC WIRE ROPE COMPANY
LOS ANGELES 21, CALIF., U.S.A. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than $10,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information: County of job location (capital letters); name and address of contractor (bold face); bid price; brief description of work; awarding agency; and approximate date of award. More detailed information may be secured concerning employment conditions, wage rates, etc., by writing directly to the contractor. When available, the names of the supervisory personnel will be published in the "Supervising the Jobs" columns.

CONTRACTS AWARDED

Large Western Projects . . .

L. E. Dixon Co. & Arundel Corp., San Gabriel, Calif., were given the $6,618,262 dam construction job on the Little Missouri River in Arkansas by the Corps of Engineers, Vicksburg, Miss.

Granby Constructors, Granby, Colo., consisting of **Grafe-Callahan Construction Co.,** Los Angeles, Calif., **Gunther & Shirley Construction Co.,** Los Angeles; **Brown & Root, Inc.,** Houston, Tex.; **Condon-Cunningham Co.,** Omaha, Neb.; **Ed Honnen,** Colorado Springs, Colo.; **Martin Wunderlich,** Jefferson City, Mo.; and **Peter Kiewit Sons Co.,** Omaha, Neb., were awarded a $4,139,998 contract by the Bureau of Reclamation, Denver, Colo., on Schedule I, for the construction of the Granby pumping plant, Colorado-Big Thompson Project, Colorado.

Stolte Inc. & Morrison-Knudsen Co., Inc., of Fairfield, Calif., received $3,000,000 from the Corps of Engineers at Sacramento, for construction of foundations for bldg. at Army Air Base, Fairfield.

Thomas Yglesias, Mexico City, D. F., will build the earth and rockfill Santa Teresa Dam, south of Nogales, Mexico. Mexican government awarded the contract.

Cahill Bros., San Francisco, Calif., will construct a $2,000,000 brewery bldg. in Azusa, Calif., for the General Brewing Corp. of San Francisco.

Parish Bros., Benicia, Calif., have a $1,072,147 contract from the Bureau of Reclamation, Antioch, for construction on Contra Costa, Clayton and Ygnacio Canals, Central Valley Project, Calif.

Guy F. Atkinson Co., Portland, Ore., has a $526,500 contract from the Willamette University Board of Regents, Salem, Ore., for the construction of a bldg. at 12th and State Sts. in Salem.

Robert E. McKee, Los Angeles, Calif., has a $2,319,388 contract from the Corps of Engineers at Albuquerque, New Mexico, for the construction of bldgs., sewer, gas and water systems, road work, etc., at Sandia Base in Albuquerque.

Standard Dredging Co., Galveston, Tex., was awarded the $719,338 contract by the Corps of Engineers, Galveston, to dredge between North Bird Island and Baffin Bay, Tex.

Walter G. Meyers, Spokane, Wash., will build a hospital wing at Edgecliff Sanatorium, Spokane County. The County Commission awarded the $620,987 contract.

Macco Corp., Clearwater, Calif., received $1,563,876 to construct a flood control channel and levees, San Gabriel Canyon to Santa Fe Dam, Calif. Corps of Engineers at Los Angeles, made the award.

Charles T. Brown, San Fernando, Calif., will build the Scotts Flat Dam in Nevada Co., Calif. The $519,740 contract was awarded by the Nevada Irrigation District, Grass Valley, Calif.

D. G. Gordon Construction Co., Denver, Colo., and **Bressi-Bevanda Construction Co.,** Los Angeles, Calif., will be given $1,381,425 for the first unit of Cherry Creek Dam construction, in Arapahoe County, Colorado. Award made by District Engineer, Denver.

P. S. Lord of Portland, Ore., was awarded a $568,929 contract

by the City Council in Vancouver, Wash., for the constructio of a sewer system in Vancouver.

Basalt Rock Co., Inc., Napa, Calif., received $841,500 to construc a rubble breakwater in Crescent City, Calif. The Corps of Eng neers at San Francisco made the award.

Pugh Construction Co., Ltd., Wilmington, Calif., will buil wharves and bulkheads for the City Harbor Department, fo $595,750 at the Inner Harbor, Long Beach, Calif.

W. O. Pelphrey, Wichita Falls, Tex., will receive $613,148 fro the State Highway Department at Austin for 5.8 mi. of highwa work in Dallas Co., Tex.

Kaiser Community Homes, Los Angeles, Calif., will build 23 homes at $1,432,200 in the Venice District of Los Angeles.

Morrison-Knudsen Co., Inc., San Francisco, Calif., have the co tract for the construction of the Electra Powerhouse and ap purtenances in Amador Co., Calif. The Pacific Gas & Electri Co., San Francisco, awarded the contract.

Guy F. Atkinson Co., South San Francisco, Calif., received $743 485 for the construction of the first portion of the McNary Da project, Benton County, Oregon. Corps of Engineers, Portlan awarded the contract.

Vinnell Co., Inc., Alhambra, Calif., will construct the $1,925,90 Jackson Gulch Dam in Colorado for the Bureau of Reclamatio at Denver.

Peter Kiewit Sons' Co., Seattle, Wash., received $678,771 fo highway and bridge construction in Cowlitz County, Wash from the Department of Highways at Olympia.

Moore & Roberts, San Francisco, Calif., will build an $895,11 hospital wing and barracks bldg. at the Veterans' Home i Yountville, Calif., for the State Division of Architecture, Sacra mento.

Harms Bros., Sacramento, Calif., received $814,273 from th Bureau of Reclamation at Redding, Calif., for the constructio of earthwork and structures at Shasta Dam, Calif.

Porter W. Yett, Portland, Ore., will construct 2 overcrossing Sunset Hwy., Washington County, Ore. The State Highwa Commission, Salem, awarded the $734,152 contract.

Vinnell & Co., Inc., Alhambra, Calif., was awarded a $591,4 contract by the Bureau of Reclamation, Denver, for the co struction of a pumping plant and pump canal, between Granb and Grand Lake, Colo.

Highway and Street . . .

Arizona

COCONINO CO.—**Bowen, McLaughlin & Lynch,** Box 403 Phoenix—$146,107 for grade, drain and base on Perkinsvill Williams Hwy., south of Williams—by State Highway Depar ment, Phoenix. 4-

MARICOPA CO. — **Phoenix-Tempe Stone Co.,** Box 167 Phoenix—$18,203 to pave 9th St., betw. Buchanan and Jefferso Sts., Phoenix—by City Council, Phoenix. 4-

MARICOPA CO.—**Tiffany Construction Co.,** Box 846, Phoen —$23,302 to grade and pave portions of block 23, through 34 Peoria—by Peoria Improvement District, Phoenix. 4-

YAVAPAI CO. — **Bowen, McLaughlin & Lynch,** Box 403 Phoenix—$383,312 for grade, drain, base, surf. and seal coat o Kingman-Ashfork Hwy., near Seligman—by State Highwa Department, Phoenix. 4-

California

CONTRA COSTA CO.—**Keeble & Brown,** Box 669, San Mat —$57,110 for constr. of .5 mi. access rd., Naval Fuel Anne Richmond—by Public Roads Administration, San Francisco. 4-

FRESNO CO.—**Gunner Corp.,** 272 Annandale Rd., Pasadena $107,885 for 6.4 mi. widen and surf. betw. 4.6 mi. N. of King C line and Mountain View Ave., and 4.8 mi. resurf. betw. Fowl and Calwa overpass—by Division of Highways, Sacramento. 4-

HUMBOLDT CO.—**Clements & Co.,** Box 277, Hayward—$8 295 for 3.2 mi. base, surf. and seal coat betw. Greenlaw Bluff a Scotia—by Division of Highways, Sacramento. 4-

LASSEN CO.—**Clements & Co.,** Box 277, Hayward—$119,8 for 12.4 mi. plant mix surf. and constr. shoulders, betw. Milfo and Bird Flat—by Division of Highways, Sacramento. 4-

LOS ANGELES AND ORANGE COS.—**Jesse S. Smith,** 4

E. Ross, Glendale—$96,200 for 5.9 mi. plant mix surf. on Firestone Blvd., betw. Pioneer Blvd. and Lincoln Ave.—by Division of Highways, Sacramento. 4-9

MARIN CO.—**Lee J. Immel,** Box 175, San Pablo—$74,603 for 2.2 mi. resurf. and seal coat, betw. San Rafael and Waldo—by Division of Highways, Sacramento. 4-18

MENDOCINO CO.—**Clements & Co.,** Box 277, Hayward—$152,760 for 6.6 mi. cement treated base and plant mix surf. and seal coat betw. Hopland and Crawford Ranch—by Division of Highways, Sacramento. 4-9

MERCED CO.—**M. J. Ruddy & Son,** 922 J St., Modesto—$84,-973 for 5.3 mi. plant mix surf. on untreated rock base from Planada, east—by Division of Highways, Sacramento. 4-23

MONTEREY CO.—**Granite Construction Co.,** Box 900, Watsonville—$17,948 to improve Munras Ave., Monterey—by City Council, Monterey. 4-22

PLUMAS AND LASSEN COS.—**Fredrickson & Watson Construction Co.,** 873 81st Ave., Oakland—$81,965 for 1.1 mi. grade, surf. and seal coat near Plumas-Lassen Co. line—by Division of Highways, Sacramento. 4-22

RIVERSIDE CO.—**MacArthur & Son,** Box 82, Palmdale—$56,-989 for 12.3 mi. road mix surf. near Palowalla and Blythe—by Division of Highways, Sacramento. 4-15

SACRAMENTO CO.—**A. Teichert & Son, Inc.,** Box 1133, Sacramento—$56,315 for improvement to Wright and Kimbrough, Arden Park Vista—by County Commission, Sacramento. 4-14

SAN FRANCISCO CO.—**R. Flatland,** 1000 Portola Dr., San Francisco—$93,882 to improve Third St., from Custer Ave. to Bayshore Blvd., San Francisco—by Department of Public Works, San Francisco. 4-14

SAN JOAQUIN CO.—**S. M. McGaw Co.,** Elks Bldg., Stockton—$61,882 to surf. on Thornton Rd., and other portions of county rd.—by County Commission, Stockton. 4-17

SAN JOAQUIN CO.—**M.J.B. Construction Co.,** Elks' Bldg., Stockton—$493,715 for 4.4 mi. surf on rock base, betw. Middle River and Holt—by Division of Highways, Sacramento. 4-23

SAN LUIS OBISPO CO.—**A. Madonna,** 1028 Chorro, San Lui Obispo—$50,897 for 3.2 mi. grade, base and seal coat on Os Falco-Nipomo Rd., betw. Southern Pacific R.R. and 3.2 mi. E.— by Division of Highways, Sacramento. 4-1

SAN LUIS OBISPO CO.—**Nathan A. Moore,** 105 E. Garve Blvd., San Gabriel—$49,459 for 6 mi. grade and place imported base material between State Hwy. 137 and Rinconada-Las Pili tas Rd.—by Division of Highways, Sacramento. 4-

SAN MATEO CO.—**Piombo Bros. & Co.,** 1571 Turk St., Sa Francisco—$212,036 to grade and constr. sand drains betw. th Southern Pacific RR. and a point about .5 mi. S.—by Divisio of Highways, Sacramento. 4-1

SAN MATEO CO.—**T. & B. Construction Co.,** Box 1, Colma— $12,250 for 4.7 mi. clear and grub, San Mateo—by County Com mission, San Mateo. 4-1

SANTA CLARA CO.—**Verne D. Freeman,** 346 Portola Ave Palo Alto—$97,319 to improve Melville Ave., Palo Alto—by Cit Council, Palo Alto. 4-2

SOLANO CO.—**J. Henry Harris,** 2657 9th St., Berkeley—$84, 685 to widen Tennessee St., betw. Sonoma and Monterey Sts Vallejo—by City Council, Vallejo. 4-2

SONOMA CO.—**A. G. Raisch Co.,** 2043 Market St., San Fran cisco—$85,911 for 4 mi. resurf. with asph. conc., betw. 3 mi. N of Petaluma and 1 mi. S.—by Division of Highways, Sacramento 4-2

TEHAMA CO.—**Morrison-Knudsen Co., Inc.,** Crocker Firs National Bank Bldg., San Francisco—$123,009 for 2.8 mi. grave and plant mix surf. on crushed run base, betw. Mill Race Cree and Red Bluff—by Division fo Highways, Sacramento. 4-1

TULARE AND KERN COS.—**Griffith Co.,** 1060 S. Broadway Los Angeles—$80,685 for 8.3 mi. plant mix surf., betw. Delan and Earlimart and east of Wasco and Famoso—by Division o Highways, Sacramento. 4-1

YOLO CO.—**McGillvray Construction Co.,** Box 873, Sacra mento—$84,129 for 9.2 mi. plant mix surf. and seal coat betw Solano Co. line, Woodland and Knights Landing—by Divisio of Highways, Sacramento. 4-1

Colorado

BACA CO.—**Colorado Construction, Inc.,** Denver—$117,265 fo 5.3 mi. gravel surf. of U. S. Hwy. No. 100, betw. Springfield an Walsh—by State Highway Department, Denver. 4-1

LAS ANIMAS CO.—**Domenic Leone Construction Co.,** Trini dad—$379,308 for 3.9 mi. gravel surf. on State Hwy. No. 1, betw Trinidad and Walsenburg—by State Highway Department Denver. 4-1

PUEBLO CO.—**Brown Construction Co.,** Pueblo—$514,375 fo 4.9 mi. grade on State Hwy. No. 1, betw. Pueblo and Walsen burg—by State Highway Department, Denver. 4-2

RIO BLANCO CO.—**J. H. & N. M. Monaghan Construction Co.,** Rt. 1, Derby—$217,449 for 2.1 mi. grade, and surf. of cut off rd. from Rangely N. to Hwy. 40—by State Highway Com mission, Helena. 4-

Kansas

CLARK CO.—**H. M. Thompson & Co.,** Ellinwood—$22,021 fo 5.2 mi. subgrade modification and single asph. surf. treatment— by State Highway Commission, Topeka. 4-9

HAMILTON CO.—**Southwest Sand & Gravel Co.,** Dodge City —$65,836 for approx. 13 mi. dense graded surf. course—by State Highway Commission, Topeka. 4-9

MEADE CO.—**H. M. Thompson & Co.,** Ellinwood—$52,991 for 13.2 mi. subgrade modification and single asph. surf. treatment—by State Highway Commission, Topeka. 4-9

NESS CO.—**Tobias & Wright Sand & Gravel Co.,** Lyons—$37,581 for approx. 30 mi. light type surf. selected embankment material and some subgrade reconditioning—by State Highway Commission, Topeka. 4-9

PRATT CO.—**San-Ore Construction Co.,** McPherson—$97,495 for 8.4 mi. subgrade modification and dense graded surf. course—by State Highway Commission, Topeka. 4-1

PRATT CO.—**San-Ore Construction Co.,** McPherson—$67,622 for 15.5 mi. dense graded surf. course—by State Highway Commission, Topeka. 4-9

PRATT CO.—**H. M. Thompson & Co.,** Ellinwood—$11,602 for 2 mi. grading—by State Highway Commission, Topeka. 4-1

STAFFORD CO.—**Broce Construction Co.,** Dodge City—$16,886 for approx. 22 mi. bitum. sealing—by State Highway Commission, Topeka. 4-1

Montana

CASCADE CO.—**S. J. Groves & Sons,** Minneapolis, Minn.—$225,355 for 2.2 mi. grade, surf. and oil, Ulm-Great Falls Hwy., near Gore Hill—by State Highway Commission, Helena. 4-1

GARFIELD CO.—**Albert Lalonde Co.,** Sidney—$161,899 for 4.8 mi. surf. and oil, Grass Range-Jordan Hwy., betw. Mosby and Sand Springs—by State Highway Commission, Helena. 4-1

LIBERTY CO.—**McLaughlin, Inc.,** Great Falls—$347,703 for 3.7 mi. grade, surf. and oil, of Shelby-Chester Hwy.—by State Highway Commission, Helena. 4-1

LINCOLN CO.—**Union Construction Co.,** Great Falls—$72,637 crushing and stockpiling 37,500 cu. yd. of ½-in. crushed gravel surf. and 36,875 mi. yds. of haul from 5 crusher setups in Lincoln Co.—by State Highway Commission, Helena. 4-22

VARIOUS COS.—**Peter Kiewit Sons Co.,** Omaha National Bank Bldg., Omaha, Nebr.—$96,312 to crush and stockpile 45,000 cu. yd. of ½-in. crushed gravel in Big Horn, Carbon, Stillwater and Yellowstone Cos.—by State Highway Commission, Helena. 4-22

Nevada

LANDER CO.—**Dodge Construction Co.,** N. Main St., Fallon —$275,000 for 8.6 mi. hwy. constr. betw. ¾ mi. E. of Battle Mt. to 9.3 mi. E. of Battle Mt., Rt. 1, Section A-2—by Department of Highways, Carson City. 4-11

North Dakota

BOWMAN CO.—**Archie Campbell,** Warwick—$435,257 for 19.8 mi. grade and incidental items on U. S. Hwy. No. 12, Bowman east—by State Highway Department, Bismarck. 4-11

BOWMAN CO.—**Rue Construction Co.,** Omaha, Nebr.—$34,482 for 19.8 mi. structl. and incidental items on U. S. Hwy. No. 12, Bowman east—by State Highway Department, Bismarck. 4-11

WARD AND McHENRY COS.—**W. H. Noel Co.,** Jamestown —$353,378 for 16.1 mi. grade and incidental work on U. S. Hwy. No. 52, E. of Sawyer to Balfour and on State Hwy. No. 41, Velva S.—by State Highway Department, Bismarck. 4-11

VARIOUS COS.—**Inland Construction Co.,** 3867 Leavenworth St., Omaha, Nebr.—$90,441 for 92,287 cu. yd. of dumped replenishment gravel on U. S. Hwy. No. 12 and 85, and State Hwy. No. 22 and 8, in Bowman, Slope, Adams and Hettinger Cos.—by State Highway Commission, Bismarck. 4-11

Oregon

CLACKAMAS, HOOD RIVER AND WASCO COS.—**J. N. & M. J. Conley,** Portland—$42,975 for constr. of Mt. Hood production proj. on Mt. Hood and Wapinitia Hwy.—by State Highway Commission, Salem. 4-11

LANE CO.—**D. F. McKenzie,** Salem—$117,950 for 1.2 mi. regrade and 6 mi. surf. and oil of Gillespie Corner-Lorane Section of Territorial Secondary Hwy.—by State Highway Commission, Salem. 4-11

MALHEUR CO.—**P. B. Doherty & Sons,** Portland—$34,65 for constr. of Jordan Creek-Rock Creek production project—b State Highway Commission, Salem. 4-1

MALHEUR CO.—**Stanley & Eylan,** Boise, Ida.—$82,363 t widen Ontario Section of Old Oregon Trail—by State Highwa Commission, Salem. 4-1

MALHEUR CO.—**Stanley & Eylan,** Boise, Ida.—$54,078 t constr. Nyssa Section of Old Oregon Trail—by State Highwa Commission, Salem. 4-1

UMATILLA CO.—**Newport Construction Co.,** 7031 N.E. Hal sey St., Portland—$247,007 to oil and gravel 56 mi. of county rds —by County Commission, Pendleton. 4-1

Texas

ANDREWS CO.—**D. S. & R. Construction Co.,** Box 1284, Ker mit—$182,909 for 19.6 mi. grade, base and surf. treatment—b State Highway Department, Austin. 4-1

BAILEY CO.—**Kerr & Middleton,** Lubbock—$192,716 for 25. mi. grade, drain and surf. f. m. rd. from approx. 5 mi. W. o Muleshoe to N. Mex. State line—by County Commission, Mule shoe. 4-

BAILEY CO.—**Panhandle Construction Co.,** Lubbock—$89,81 to pave streets in Muleshoe—by City Council, Muleshoe. 4-2

CHILDRESS CO.—**Benson & McGann,** Wichita Falls—$57,26 for .7 mi. grade and pavement widening—by State Highway De partment, Austin. 4-1

COMAL CO.—**Dean Word & Co.,** New Braunfels—$84,226 fo 8.8 mi. grade, struct., flexible base and surf.—by State Highwa Department, Austin. 4-1

DALLAS CO.—**North Texas Concrete Co.,** 2608 Inwood Rd. Dallas—$11,221 to pave Searcy St., Ravinia to Cowart St., an Cowart from Searcy to Tilton, Dallas—by City Council, Dallas 4-

DALLAS CO.—**W. O. Pelphrey,** Box 722, Wichita Falls—$613, 148 for 5.8 mi. grade, base and base preservative—by State High way Department, Austin. 4-2

GAINES CO.—**Gaylord Construction Co.,** 806 Blodgett St. Houston—$180,601 for 19.5 mi. asph. conc. pave. from Seminol to Terry—by State Highway Department, Austin. 4-2

HARDEMAN & WILBARGER COS.—**Amarillo Bridge Co.,** Herring Hotel Bldg., Amarillo—$53,163 for 6.3 mi. grade, drain nd base on Hwy. FM 91—by State Highway Department, Austin. 4-17

ACK CO.—**Wright & Ruminer Construction Co.,** Box 4245, station A, Dallas—$123,980 for 12 mi. grade, drain, roadbed reatment, and base preservative—by State Highway Depart-ient, Austin. 4-17

ONES CO.—**Armstrong & Armstrong,** Box 873, Roswell, N. Mex.—$342,057 for 14.9 mi. grade, base and surf.—by State High-way Department, Austin. 4-22

AMB CO.—**Purtel & Williams,** Box 236, Waco—$320,050 for 1 mi. grade, drain, and asph. surf. in District I-A, Littlefield—y County Commission, Littlefield. 4-2

AMB AND BAILEY COS.—**H. E. Williams,** Box 235, Waco —$111,432 for 17.9 mi. grade, base and double asph. surf. treat-ient, Hwy. FM 303 and 298—by State Highway Department, ustin. 4-17

AVARRO CO.—**L. H. Lacy & Co.,** Box 5726, Dallas—$482,379 or 11.5 mi. concrete pave from 31st St. in Corsicana to Silver ity—by State Highway Department, Austin. 4-22

ARRANT CO. — **Texas Bitulithic Co.,** Clifford Ave., Fort Worth—$138,172 to pave Bowie, Canty and Bellaire Dr., Fort Worth—by City Council, Fort Worth. 4-24

Utah

OX ELDER CO.—**Ford & Ferguson,** 491 E. 2nd North, Provo —$110,118 for 17.6 mi. gravel surf. State Hwy. No. 83, betw. orinne and Lampo—by State Road Commission, Salt Lake ity. 4-14

OOELE & JUAB COS.—**V. C. Mendenhall Co.,** Springville—146,915 for 12.2 mi. grade and surf. on State Hwy. No. 36, betw. oulder Summit and St. John—by State Road Commission, Salt ake City. 4-14

Washington

HELAN CO.—**McAtee & Heathe,** Box 2188, Spokane—$208,-03 for 8.4 mi. ballast, surf. and pave P. State Hwy. No. 15, ummit to Gaynor—by Department of Highways, Olympia. 4-16

OWLITZ CO.—**Northwest Construction Co.,** 3950 6th Ave. W., Seattle—$84,190 for .3 mi. clear, grub and grade P. State wy. No. 1, Coweman River north—by Department of High-ays, Olympia. 4-16

ERRY CO.—**Western Asphalt Co.,** 309 W. 39th St., Seattle—125,774 for 72.9 mi. surf. and seal coat and mfg. crushed stone rf. on State Hwys. 4 & 4-A, betw. Republic and Alice Creek d Republic and British Columbia Line—by Department of ighways, Olympia. 4-11

RANKLIN CO.—**Curtis Gravel Co.,** Box 106, Spokane—$80,-00 for 12.7 mi. light bitum. surf. treatment on Pasco-Kahlotus l.—by Department of Highways, Olympia. 4-16

ING CO.—**Toney Romano Co.,** 1833 Dearborn St., Seattle—9,359 to pave portion of alley betw. Blks. 1 and 2, Niez plat, eattle—by City Council, Seattle. 4-11

POKANE CO.—**Inland Asphalt Co.,** 10th and Havana Sts. okane—$60,000 to pave various sts. in Spokane—by City ouncil, Spokane. 4-3

POKANE CO.—**Chas. A. Power,** Box 1220, Spokane—$146,-2 for 3.6 mi. grade, surf. and pave on Primary State Hwy. No. betw. Spokane and Geiger Field Rd.—by Department of High-ays, Olympia. 4-11

AKIMA CO.—**C. E. O'Neal Co., Inc.,** Box 268, Ellensburg—0,896 for 5.4 mi. ballast and surf, roads near Grandview—by ounty Commission, Grandview. 4-3

AKIMA CO.—**C. E. O'Neal Co., Inc.,** Box 268, Ellensburg—6,431 for 4.9 mi. widen shoulders on P. State Hwy. No. 8 oppenish to Toppenish Creek—by Department of Highways, lympia. 4-16

Wyoming

ARAMIE CO.—**Inland Construction Co.,** 3867 Leavenworth ., Omaha, Nebr.—$129,689 for 8 mi. drain, grade and surf. tw. Pine Bluffs and Albin—by State Highway Department, heyenne. 4-1

WEETWATER CO. — **Teton Construction Co.,** Box 197, heyenne—$55,948 for 14 mi. of surf. of Lincoln Hwy., betw. ed Desert and Table Rock—by State Highway Department, heyenne. 4-1

Bridge . . .

Arizona

COCONINO CO. — **Dail Engineering & Construction Co.,** Box 1846, Phoenix—$58,382 for bridge repair on Flagstaff-Fredonia Hwy., approx. 52 mi. north of Flagstaff, U. S. Hwy. 89—by State Highway Department, Phoenix. 4-18

California

COLUSA CO.—**Lord & Bishop,** Box 812, Sacramento — $136,165 to repair existing bridge across Sacramento River at Colusa —by Division of Highways, Sacramento. 4-23

CONTRA COSTA CO. — **Duncanson-Harrelson Co.,** De Young Bldg., San Francisco—$226,434 for constr. of steel plate girder swing bridge and reinf. conc. approach spans over Pacheco Slough near Avon—by Division of Highways, Sacramento. 4-16

KERN AND INYO COS.—**Basich Bros. Construction Co., and Basich Bros.,** Box 151, 600 S. Fremont Ave., Alhambra — $199,539 for constr. of steel bridge and 2.7 mi. grade and surf., betw. Indian Wells and Little Lake—by Division of Highways, Sacramento. 4-23

LAKE CO.—**Arthur B. Siri,** 1357 Cleveland Ave., Santa Rosa—$31,625 for constr. of reinf. conc. bridge and approaches, across Kelsey Creek at Cobb—by Division of Highways, Sacramento. 4-29

MADERA CO.—**Dan Caputo,** 945 Delmas Ave., San Jose — $78,799 for constr. of struct. steel bridge and .2 mi. grade approaches across Fine Gold Creek, NE. of Madera—by Division of Highways, Sacramento. 4-25

PLUMAS CO.—**C. C. Steele,** 3925 Franklin Blvd., Sacramento—$42,012 for constr. of reinf. conc. bridge across N. fork of Feather River at Chester — by County Commission, Plumas. 4-18

SAN BERNARDINO CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—$372,811 for constr. of bridges at San Timoteo Creek and Santa Ana River on Waterman Ave., betw. Riverside-Redlands Rd. and Mill St. —by Division of Highways, Sacramento. 4-14

SAN DIEGO CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles — $77,665 for constr. of reinf. conc. bridge and .3 mi. grade and surf., Dulzura Creek, south of Jamul—by Division of Highways, Sacramento. 4-14

SAN FRANCISCO CO.—**Eaton & Smith,** 715 Ocean Ave., San Francisco—$67,500 for bridge at Evans Ave. and Army St., San Francisco—by Department of Public Works, San Francisco. 4-17

SAN JOAQUIN CO.—**A. A. Edmondson & A. L. Miller,** 1715 7th St., Sacramento—$159,071 to constr. struct. steel and reinf. conc. bridge across Mokelumne River, approx. 5 mi. NW. of Lodi—by Division of Highways, Sacramento. 4-25

SAN MATEO CO. — **Sorensen & Oser,** 927 Arguello St., Redwood City—$412,331 to constr. 3 bridges and substruct. for 2 railroad overcrossings, Bayshore Freeway, So. San Francisco—by Division of Highways, Sacramento. 4-14

SANTA BARBARA CO.—**N. M. Ball Sons,** 649 S. Olive St., Los Angeles—$376,088 for 1.3 mi. grade, pave, and to widen conc. bridges betw. Sheffield Dr. and San Ysidro Rd. — by Division of Highways Sacramento. 4-11

SOLANO CO.—**Bati Rocca & G. M. Carr** 2333 Burbank Ave., Santa Rosa—$85,420 to constr. 5 bridges across Pleasant Creek Alamo Creek at Putah Creek tributary betw. 1.5 and 14 mi. NW. of Vacaville—by Division of Highways, Sacramento. 4-11

STANISLAUS CO.—**Fredrickson & Watson Construction Co.,** 873 - 81st Ave., Oakland—$341,808 to constr. steel bridge across Stanislaus River, 8 mi. NW. of Modesto on U. S. Hwy. 99—by Division of Highways, Sacramento. 4-28

Montana

CASCADE CO.—**Nilson Smith Constructors,** Great Falls — $313,718 for 9.8 mi. grade, surf., road mix oil and constr. of 2 timber structs., Great Falls-Eden Hwy., betw. Great Falls and Stockett—by State Highway Commission, Helena. 4-1

Oregon

COOS CO. — **Coos Bay Dredging Co.,** Coos Bay—$18,991 to replace pier fender for S. Slough bridge, Cape Arago Secondary Hwy.—by State Highway Commission, Salem. 4-11

LINCOLN CO.—**Pacific Bridge Painting Co.,** 55 New Montgomery St., San Francisco—$14,149 to paint Yaquina Bay bridge on Oregon Coast Hwy.—by State Highway Commission, Salem. 4-11

SHERMAN CO.—**J. P. Britton & Co.,** Portland—$37,320 to constr. Buck Hollow

Creek bridge—by State Highway Commission, Salem. 4-11

WASHINGTON CO.—**Porter W. Yett,** 5500 NE. Ainsworth, Portland—$734,152 for 2.5 mi. grade and pave and constr. of 2 overcrossings Barnes Rd. - Multnomah Co. line, Sunset Hwy. — by State Highway Commission, Salem. 4-22

Texas

DALLAS & KAUFMAN COS.—**Wallace & Bowden,** 5513 E. Grand Ave., Dallas—$508,598 for constr. of .6 mi. bridges from Dallas-Kaufman county line to Crandall—by State Highway Department, Austin. 4-22

Washington

COWLITZ CO.—**Peter Kiewit Sons' Co.,** 1403 W. 45th St., Seattle—$678,771 for 4.3 mi. clear, grub, grade and constr. steel girder bridge on Primary State Hwy. No. 1, betw. Ostrander and Castle Rock—by Department of Highways, Olympia. 4-11

PACIFIC CO.—**Don L. Cooney, Inc.,** 1749 Airport Way, Seattle—$69,637 to constr. reinf. conc. flat slab bridge on Primary State Hwy. No. 12, Raymond East Bridge —by Department of Highways, Olympia. 4-11

SKAGIT, ISLAND AND KING COS.—**Puget Sound Painters, Inc.,** 2001 5th Ave., N., Seattle — $38,895 to clean and paint Canoe Pass, Deception Pass and Green River bridges on Secondary State Hwy. 1-D and 5-M — by State Department of Highways, Olympia. 4-11

WAHKIAKUM CO.—**General Construction Co.,** Box 3244, Seattle—$109,104 to constr. steel girder bridge on S. State Hwy. No. 12-F, Puget Sound Island—by Department of Highways, Olympia. 4-16

VARIOUS COS.—**Coast Bridge & Steel Co.,** Seattle—$12,032 to repair trusses on bridges in King, Whatcom, Skagit and Snohomish Cos.—by Department of Highways, Olympia. 4-16

Wyoming

HOT SPRINGS CO.—**Taggart Construction Co.,** Box 560, Cody—$73,188 to constr. 1-span steel and conc. bridge on hwy., betw. Worland and Thermopolis—by State Department of Highways, Cheyenne. 4-1

NIOBARA CO.—**Warrington Construction Co.,** Cheyenne—$31,900 to grade, oil and drain 6 mi. of roadway in Kirtley district — by State Highway Department, Cheyenne. 4-1

Airport . . .

California

LOS ANGELES CO.—**Morrison-Knudsen Co., Inc.,** Title Guarantee Bldg., Los Angeles—$213,346 for site grade and misc. work on extension of Runway 'A', Los Angeles Airport—by City Board of Public Works, Los Angeles. 4-4

Nevada

ELKO CO.—**C. E. Nelson Co.,** Logan, Utah—$101,305 on Schedule I for grade, seal, east-west runway and clearing and grade of northeast and southwest landing strip at Wells—by Civil Aeronautics Administration, Los Angeles, Calif. 4-4

Utah

UTAH CO.—**Morrison-Knudsen Co., Inc.,** 1520 N. Chicago St., Salt Lake City—$200,000 negotiated contract for constr. of dikes

around Municipal Airport, Provo — by Corps of Engineers, Salt Lake City. 4-4

Water Supply . . .

Arizona

MARICOPA CO.—**Arizona Concrete Pipe Co.,** 1746 W. Fillmore Ave., Phoenix—$28-660 to clean 14½ mi. exist. C.I. water mains in Phoenix—by City Council, Phoenix. 4-4

California

ALAMEDA CO.—**Henry Arian Construction Co.,** 4142 Geary Blvd., San Francisco—$14,745 to install water softener equipment, Naval Hospital, Oakland—by Public Works Department, San Francisco. 4-1

LOS ANGELES CO.—**J. E. Young,** 877 Otis St., South Gate—$25,622 to install steel pipe water mains, steel pipe and C.I. pipe lines in Torrance—by City Council, Torrance. 4-11

SAN DIEGO CO. — **Tate Pipe Linings, Inc.,** 849 E. Lime Ave., Monrovia—$56,565 to clean and line with cement, water mains in Balboa and Morena Sts., San Diego—by City Council, San Diego. 4-18

SANTA BARBARA CO.—**Smee's Plumbing & Heating,** 1302 Osos St., San Louis Obispo—$27,400 to install water and sewer systems in 37th Agricultural District, Santa Maria—by Division of Architecture, Sacramento. 4-30

STANISLAUS CO.—**Wallace & Tiernan Sales Corp.,** 12 Minna St., San Francisco—$16,629 to furn. and install chlorination equipment at industrial waste treatmen plant, Modesto—by City Council, Modesto 4-1

Texas

DALLAS CO.—**W. G. Cullum Co.,** Grea National Life Bldg., Dallas—$10,130 to in stall water mains in Inwood Rd., Mont rose, NW. Hwy., Lemmon and Shorecres Sts., Dallas—by City Council, Dallas. 4-1

DALLAS CO.—**Ben Gira & Co.,** 3901 Elm St., Dallas—$13,246 to install water main in portion of Bluebonnet Acres, Dallas—by City Council, Dallas. 4-1

DALLAS CO.—**O. J. Parrott Construction Co.,** Tower Petroleum Bldg., Dallas—$23,448 to install water mains in Urbandale Addition, Dallas—by City Council, Dallas 4-1

DALLAS CO. — **E. H. Reeder,** Dallas—$21,000 to constr. water mains in Parnell Alma to Lamar, Dallas—by City Council Dallas. 4-2

DAWSON CO.—**Enix Construction Co.** 711 Main St., Houston—$195,444 for constr of water supply lines in Lamesa—by City Council, Lamesa. 4-2

FLOYD CO.—**Sherman Machine & Iron Works,** 26 E. Main St., Oklahoma City—$74,654 to const. water storage reservoi and appurtenances, Floydada — by City Council, Floydada. 4-1

Washington

KING CO.—**Valley Construction Co.,** 7708 Rainier Ave., Seattle—$367,760 for constr of Bow Lake pipeline, slightly south o Seattle—by City Council, Seattle. 4-1

Sewerage . . .

California

ALAMEDA CO.—**Fred J. Early, Jr.,** 369 Pine St., San Francisco—$87,599 to constr a 2200-hp. electrically operated pump station and appurtenances, near Irvington—by Department of Public Works, San Francisco. 4-1

ALAMEDA CO.—**Oakland Sewer Construction Co.,** 9915 Walnut St., Oakland—$69,572 for constr. of sewers in Hillcrest Knolls, Hayward—by Oro Loma Sanitary District, Hayward. 4-2

LOS ANGELES CO.—**D. D. Gray,** 209 Ave. A, Redondo Beach—$37,250 to install sewers in Kornblum Ave. and other Sts. Los Angeles—by County Board of Supervisors, Los Angeles. 4-1

LOS ANGELES CO.—**I. C. Construction Co.,** 1022 Arden Dr., Temple City—$131,090 to install sewers in Layton Dr. and Sunset Blvd. Sewer District, Los Angeles — by City Board of Public Works, Los Angeles 4-4

LOS ANGELES CO.—**Mike Miller Co.** 877 N. Bunker Hill, Los Angeles—$30,379 to install sanitary sewers in Bel Air, Inglewood—by Somera Corp., Inglewood. 8-2

ORANGE CO.—**Pernel Barnett,** 747 W Chapman, Orange — $12,096 to install sewers in Buena Park District—by City Council, Buena Park. 4-1

SAN DIEGO CO.—**H. H. Peterson,** 3340 Harasthy, San Diego—$49,900 to constr storm drain in Polk Ave., San Diego—by City Council, San Diego. 4-2

SAN FRANCISCO CO.—**M. J. Lynch,** 2251 Revere Ave., San Francisco—$62,222 for replacement of sewers in Caselli Ave

and Douglas St. from Eagle St. to 18th St., San Francisco—by Department of Public Works, San Francisco. 4-14

SAN JOAQUIN CO.—**Downer Co., Inc.,** 305 E. Weber Ave., Stockton—$26,363 to install sanitary sewer system for Elmwood and Roosevelt Schools, Stockton—by City Unified School District, Stockton. 4-29

SAN JOAQUIN CO. — **Stockton Construction Co.,** Box 2087, Stockton—$70,259 to install Eastside interceptor sanitary sewer, from Hazelton Ave. and Wilson Way to E. Fremont St. and Wizard Ave., Stockton—by City Council, Stockton. 4-22

SAN JOAQUIN CO. — **Stockton Construction Co.,** Box 2087, Stockton—$16,613 to install sanitary sewers in Mendocino Ave., betw. Pershing to Kensington Way and Kensington Way, betw. Mendocino and Alpine Ave., Stockton—by City Council, Stockton. 4-21

SAN MATEO CO.—**L. W. Jenson,** 318 High St., Palo Alto—$21,848 to install sanitary sewers in White Oaks Tract Subdiv. No. 5 and Redwood Heights Quarter Acres Subdiv., San Carlos—by City Council, San Carlos. 4-29

SANTA CLARA CO.—**L. W. Jensen,** 318 High St., Palo Alto—$195,110 for culverts, drain ditch, Louis rd., Palo Alto—by City Council, Palo Alto. 4-29

TULARE CO. — **Pacific Pipeline Construction Co., & Engineers, Ltd.,** 3000 Railroad Ave., Fresno—$28,000 to install sewer line in Kern St., Tulare—by City Council, Tulare. 4-22

TULARE CO.—**Pacific Pipeline & Engineers Ltd.,** 2268 Firestone Blvd., Los Angeles—$18,693 to install sewers in Tulare—by City Council, Tulare. 4-11

Texas

HEMPHILL CO. — **Enix Construction Co.,** Houston—$89,983 for sewage disposal plant and sewer extensions, Canadian—by City Council, Canadian. 4-8

TARRANT CO.—**E. L. Dalton & Co.,** Great National Life Bldg., Dallas—$31,908 to install sanitary sewers in Cowonville Section, Fort Worth — by City Council, Fort Worth. 4-14

TARRANT CO. — **E. J. Tidwell,** Fort Worth—$24,690 to install storm sewers in various parts of Fort Worth — by City Council, Fort Worth. 4-23

Washington

CHELAN CO.—**Ford & Walter,** 1043 E. 90th, Seattle — $31,810 to install storm sewers in Cashmere — by City Council, Cashmere. 4-17

CLARK CO.—**P. S. Lord,** 4507 SE. Milwaukie Blvd., Portland, Ore.—$568,929 for constr. of interceptor sewer system in Vancouver—by City Council, Vancouver. 4-25

SNOHOMISH CO.—**Lambert Construction Co.,** 2450 Boyer Ave., Seattle—$13,537 to constr. deep-water sewer outfall near Edmonds—by City Council, Edmonds. 4-4

Waterway . . .

California

DEL NORTE CO.—**Basalt Rock Co., Inc.,** 900 8th St., Napa—$841,500 for rubble breakwater, extending from existing breakwater SE. toward Round Rock; and removal of approx. 790 cu. yd. material from

Pinnacle Rocks in fishboat harbor, Crescent City—by Corps of Engineers, San Francisco. 4-16

LOS ANGELES CO.—**Macco Corp.,** 815 N. Paramount Blvd., Clearwater—$1,563,876 for constr. of flood control channel and levees from mouth of San Gabriel Canyon to Santa Fe Dam—by Corps of Engineers, Los Angeles. 4-17

LOS ANGELES CO. — **Pugh Construction Co., Ltd.,** 1260 Alameda St., Wilmington—$595,750 for constr. of wharves, bulkheads, etc., Berths 52, 53 and 54, Long Beach Inner Harbor—by City Harbor Department, Long Beach. 4-14

LOS ANGELES CO.—**A. Teichert & Son, Inc.,** 1846 37th St., Sacramento—$418,810 for constr. of reinf. conc. conduit, 4000 ft. long, 2 reinf. conc. bridges and alter. overflow dam, Arroyo Seco Channel, Pasadena—by County Flood Control District, Los Angeles. 4-14

MARIN CO.—**Olympian Dredging Co.,** 525 Market St., San Francisco—$35,805 for 186,000 cu. yd. dredging of crash boat channel, Hamilton Field—by Corps of Engineers, San Francisco. 4-2

SAN DIEGO CO. — **Macco Corp.,** 815 Paramount Blvd., Clearwater—$20,050 to repair Piers F, G, H and I, Naval Air Station, North Island, San Diego—by Bureau of Yards & Docks, Washington, D. C. 4-18

SANTA BARBARA CO. — **Standard Dredging Corp.,** Central Bldg., Los Angeles—$79,997 for maintenance dredging and beach restoration, Santa Barbara Harbor—by Corps of Engineers, Los Angeles.

Texas

KLEBERG CO.—**Standard Dredging Co.,** Cotton Exchange Bldg., Galveston—$719,338 to dredge Gulf Intracoastal Waterway, betw. North Bird Island and Baffin Bay—by Corps of Engineers, Galveston. 4-23

Utah

WEBER CO.—**J. B. & R. E. Walker,** 10 West St., Salt Lake City—$15,000 to remove snags and renovate Ogden River, near Ogden—by Corps of Engineers, Salt Lake City. 4-1

Dam . . .

Arkansas

PIKE CO.—**L. E. Dixon Co. & Arundel Corp.,** 409 S. California St., San Gabriel, Calif.—$6,618,262 to constr. Narrows dam and power plant on Little Missouri River, approx. 7 mi. from Murfreesboro — by Corps of Engineers, Vicksburg, Miss. 4-11

California

FRESNO CO.—**Piombo Construction Co.,** 1571 Turk St., San Francisco—$261,988 for excav. of left abutment of Pine Flat Dam and constr. of access roads, near Piedra—by Corps of Engineers, Sacramento. 4-11

LOS ANGELES CO.—**Macco Corp.,** 815 Paramount Blvd., Clearwater—$298,024 for constr. of Gould Canyon Debris Dam, channel and appurtenances, La Canada—by County Flood Control District, Los Angeles. 4-14

LOS ANGELES CO. — **MacDonald & Kruse, Inc., & Hensler Construction Corp.,** 816 Allen Ave., Glendale—$368,391 to alter

and constr. reinf. conc. facing slab on San Gabriel Dam No. 2—by Board of Supervisors, Los Angeles. 4-4

NEVADA CO.—**Charles T. Brown,** 1955 6th St., San Fernando—$519,740 to constr. Scotts Flat Dam and appurtenances, approx. 4.5 mi. E. of Nevada City—by Nevada Irrigation District, Grass Valley. 4-29

Colorado

ARAPAHOE CO.—**D. G. Gordon Construction Co.,** 1900 31st St., Denver and **Bressi-Bevanda Construction Co.,** Los Angeles, Calif. — $1,381,425 (1st unit) for constr. of outlet works, including excavation, reinf. conc., reinf. steel, etc., Cherry Creek Dam, 6 mi. SE. of Denver—by Corps of Engineers, Denver. 4-21

MONTEZUMA CO.—**Vinnell Co., Inc.,** 1145 Westminster Ave., Alhambra, Calif.—$1,925,904 for constr. of Jackson Gulch Dam and outlet and inlet canals, approx. 4 mi. N. of Mancos—by Bureau of Reclamation, Denver. 4-29

Oregon

BENTON CO.—**Guy F. Atkinson Co.,** 10 W. Orange St., South San Francisco, Calif.—$743,485 for constr. of navigation lock, portion of downstream lock approach, hwy. overpass, access rd. and grade for railroad siding, on N. side of Columbia River, 3 mi. N. of Plymouth, portion of McNary Dam project—by Corps of Engineers, Portland. 4-11

Foreign

MEXICO—**Thomas Yglesias,** 21 San Juan de Letres, Mexico City, D.F.,—will constr. 2130 ft. long and 108 ft. high, earth and rock fill Santa Teresa Dam, south of Nogales, Sonora—by Ing. Adolfo Orive Alba, Secretary of Hydraulic Resources, Mexico. 4-4

Irrigation . . .

California

CONTRA COSTA CO. — **Parish Bros.,** Box 6, Benicia—$1,072,147 for earthwork, struct., canal lining from sta. 1993 plus 11 to sta. 2321 plus 25, Contra Costa Canal, Clayton and Ygnacio canals, near Pacheco and Concord—by Bureau of Reclamation, Antioch. 4-29

Colorado

GRAND CO.—**Granby Constructors,** Box 578, Granby—$4,139,988, on Schedule I, for constr. of pumping plant at Granby—by Bureau of Reclamation, Denver. 4-4

GRAND CO. — **Vinnell Co., Inc.,** 1145 Westminster Ave., Alhambra, Calif. — $591,458 on schedule No. 2, for constr. of Granby pumping plant and pump canal, betw. Granby and Grand Lake—by Bureau of Reclamation, Denver. 4-21

Idaho

VALLEY CO.—**W. C. Zavalas,** Oroville, Calif.—$348,700 to clear Cascade reservoir site, on north fork of Payette River, near Cascade — by Bureau of Reclamation, Boise. 4-1

Washington

YAKIMA CO. — **Morrison-Knudsen Co., Inc.,** Box 450, Boise, Ida.—$135,029 for constr. of earthwork, pipe lines and structs.,

lateral distribution systems, Roza Division, Yakima Project, pump areas No. 1 and 9 —by Bureau of Reclamation, Yakima. 4-21

YAKIMA CO.—**J. A. Terteling & Sons,** Box 1428, Boise, Ida.—$224,453 for constr. of earthwk., structs., pipe lines and lateral distrib. system, Pump areas 15, 16 and 17, Roza Division, Yakima project—by Bureau of Reclamation, Washington, D. C. 4-4

Tunnel . . .

Colorado

JEFFERSON CO.—**Larson Construction Co.,** 4080 Galapago St., Denver—$332,878 for constr. of tunnel and grade one mi. long, betw. Golden and Forks Creek, by way of Clear Creek—by State Highway Department, Denver. 4-18

Power . . .

California

AMADOR CO.—**Morrison-Knudsen Co., Inc.,** 111 Sutter St., San Francisco—will constr. the Electra Powerhouse, foundations for switchyard and small afterbay dam, approx. 8 mi. E. of Jackson, at Mokelumne River—by Pacific Gas & Electric Co., San Francisco. 4-30

NAPA CO.—**L. H. Leonardi Electric Construction Co.,** 717 Francisco Blvd., San Rafael—$62,000 for electrical distribution system at Veteran's Home, Yountville — by Division of Architecture, Sacramento.

Washington

FRANKLIN CO.—**Tower Sales & Erecting Co.,** 6100 NE. Columbia Blvd., Portland, Ore. — $338,781 tower crossings for 115-kv. McNary-Pasco transmission line—by Bonneville Power Administration, Portland, Ore. 4-29

Building . . .

Arizona

MARICOPA CO.—**Bridgeman Construction Co.,** 2138 E. Washington, Phoenix—$90,000 for constr. of school bldg. at Roosevelt School, School District No. 66 — by County Board of Supervisors, Phoenix. 4-11

MARICOPA CO.—**J. R. Porter,** 3407 N. 7th St., Phoenix—$123,990 for constr. of addition to Whittier School bldg., 1900 N. 16th St., Phoenix—by Board of Trustees, School District No. 1, Phoenix. 4-21

MARICOPA CO.—**Stewart Construction Co.,** Box 1788, Phoenix — $157,228 for constr. of 3 prefabricated, rigid frame warehouse bldgs., connected by one-story frame struct., Naval Reserve Armory, Phoenix—by Bureau of Yards & Docks, Washington, D. C. 4-30

PIMA CO.—**M. M. Sundt Construction Co.,** Box 2592, Tucson—$162,627 for constr. of 3 prefab. rigid frame warehouse bldgs., Naval Reserve Armory, Tucson — by Bureau of Yards & Docks, Washington, D. C. 4-16

PIMA CO.—**Womack Construction Co.,** 1712 S. Central Ave., Phoenix—$316,804 for constr. of 51 wood frame, 2 and 3-bedroom dwellings in Ajo—by Phelps Dodge Corp., Ajo. 4-18

California

ALAMEDA CO.—**Ted Barnes Construction Co.,** Box 687, Hayward—$172,500 for constr. of 23 frame and stucco dwellings, Fern Way, Castro Valley, near Hayward —by self. 4-4

ALAMEDA CO.—**Bos Construction Co.,** Park Ave., Emeryville—$102,000 for constr. of 2-story, conc. block and struct. steel factory and office bldg. at 4069 Hollis St., Emeryville—by Winslow Engraving Co., Emeryville. 4-24

ALAMEDA CO. — **Clyde S. Schwartz,** 1385 B St., Hayward—$100,000 for constr. of 2-story, steel frame and masonry church bldg. at 85th and MacArthur Blvd., East Oakland—by Neighborhood Church Board, Oakland. 4-24

ALAMEDA CO.—**Stolte, Inc.,** 8451 San Leandro Blvd., Oakland — $91,895 for constr. of one-story and mezzanine, reinf. conc. bank bldg. at E. 14th St. and 35th Ave., Oakland—by Anglo California National Bank, Oakland. 4-9

CONTRA COSTA CO.—**Peter Sartorio,** 262 Clementina St., San Francisco—$73,905 for constr. of six-room, frame classroom bldg. addition to Ambrose School, Willow Pass Rd., Pittsburg—by Ambrose School District Board, Pittsburg. 4-14

KERN CO.—**Guy E. Hall,** 1326 30th St., Bakersfield—$283,964 for constr. of one-story and part basement, steel frame and stucco grade school bldg., Oildale — by Board of Trustees, Standard School District, Oildale. 4-18

KINGS CO. — **Taylor-Wheeler Commercial, Inc.,** 420 Safford St., Fresno—$178,850 for constr. of 25-bed hospital on Hanna

Ave., Corcoran—by City Municipal Hospital, Corcoran. 4-14

LOS ANGELES CO. — **Beverly-Canon Corp.,** 1227 S. La Brea Ave., Los Angeles —$275,000 for constr. of 2-story and basement, 70-room, reinf. conc. and brick apartment bldg. at 9414 Olympic Blvd., Beverly Hills—by self. 4-4

LOS ANGELES CO.—**Beyer & Abrahamson,** Chamber of Commerce Bldg., Los Angeles—$575,000 for constr. of addition to toll bldg. at 456 Elm St., Long Beach—by Southern California Telephone Co., Los Angeles. 4-4

LOS ANGELES CO.—**Cahill Bros.,** 206 Sansome St., San Francisco—$2,000,000 for constr. of part one and part 2, 3 and 4 story, reinf. conc. and steel frame, brewery bldg., Vernon Ave. and Pacific Electric Railway Tracks, Azusa—by General Brewing Corp., San Francisco. 4-17

LOS ANGELES CO. — **George Dever,** 4158 E. Walnut St., Lynwood—$171,787 for constr. of frame and stucco classroom bldgs., Norwalk—by City School District, Norwalk. 4-10

LOS ANGELES CO. — **Ryan A. Grut,** 2012 Rockford Rd., Los Angeles—$200,000 for constr. of masonry, factory bldg. at 408 Junipero St., San Gabriel—by Clary Multiplier Corp., Los Angeles. 4-22

LOS ANGELES CO.—**R. B. Hedberg,** 357 S. Robertson Blvd., Los Angeles—$653,200 for constr. of 82, frame and stucco, 6-room dwellings, Venice District—by A. C. Johnson, Los Angeles. 4-3

LOS ANGELES CO.—**Gordon R. Howard & Geo. S. Fruehling,** 1031 S. La Brea Ave., Los Angeles—$435,000 for constr. of 50, frame and stucco, dwellings on Pepper St., Burbank—by Hollywood Way, Inc., Hollywood. 4-11

LOS ANGELES CO.—**Kaiser Community Homes,** 5555 W. Manchester Ave., Venice District—$1,432,200 for constr. of 231, frame and stucco, 5-room dwellings, Venice District—by self. 4-11

LOS ANGELES CO. — **Ted Merrill & Sons,** 3314 W. Washington Blvd., Los Angeles—$174,000 for constr. of reinf. conc. cafeteria bldg., Adolph Leuzinger High School, Rosecrans Ave., Inglewood—by Centinela Valley Union High School District, Inglewood. 4-16

LOS ANGELES CO.—**Morley Construction Co.,** 3470 Tilden St., Los Angeles—$325,660 for constr. of 49, frame and stucco, 5-room dwellings on Judd and Fillmore Sts., Van Nuys—by self. 4-4

LOS ANGELES CO.—**Wm. P. Neil Co., Ltd.,** 4814 Loma Ave., Los Angeles—$345,000 for constr. of one-story, reinf. conc. rubber cement factory bldg., 6409 E. Randolph St., Los Angeles — by Minnesota Mining & Manufacturing Co., St. Paul, Minn. 4-7

LOS ANGELES CO.—**E. C. Nesser,** 4822 W. Jefferson St., Los Angeles — $227,050 for constr. of one and part two-story, reinf. conc. and steel school shop bldg., 235 S. Grevillea Ave., Inglewood—by Centinela Valley Union High School District, Inglewood. 4-16

LOS ANGELES CO.—**Fred E. Potts Co.,** 2516 12th Ave., Los Angeles—$482,000 for constr. of 3-story, reinf. conc. factory bldg. and warehouse, 3107 E. 26th St., Vernon—by National Lead Co., Los Angeles. 4-8

LOS ANGELES CO.—**W. C. Smith, Inc.,** 2119 Pacific Blvd., Long Beach—$193,000 for constr. of reinf. conc., school bldg. at 2620 Orange Ave., La Crescenta—by Glendale Board of Education, Glendale. 4-4

MARIN CO.—**Wm. Horstmeyer & Co.,** 23 Mars St., San Francisco—$136,700 for constr. of one and part two-story, conc. and wood frame apartment bldg. at 140 Bolinas Ave., San Anselmo—by San Francisco Theological Seminary, San Anselmo. 4-2

NAPA CO.—**Moore & Roberts,** 693 Mission St., San Francisco — $895,112 for constr. of 4-story, reinf. conc. wing to hospital and reinf. conc. barracks bldg. at Veterans' Home, Yountville—by Division of Architecture, Sacramento. 4-22

NAPA CO.—**G. L. Souza & W. W. Polley,** 1094 Silverado Trails, Napa and **D. L. Goforth,** 1010 Tennessee St., Vallejo—$337,900 for constr. of 54 frame and stucco, one-story dwellings, F. J. Scansi Memorial Subdivision on S. Jefferson St., Napa—by self. 4-9

RIVERSIDE CO.—**Paul Spencer,** 832 W. 5th St., Los Angeles—$299,985 for reconversion of bldgs. into 1000 dwelling units, near Field Club, Ramon Rd., Palm Springs — by City Housing Authority, Palm Springs. 4-22

SACRAMENTO CO. — **Lawrence Construction Co.,** 3030 V St., Sacramento—$305,646 for constr. of 5th and 6th story, structl. steel and reinf. conc. addition to existing bldg. at 12th and N Sts., Sacramento—by Division of Architecture, Sacramento. 4-28

SAN JOAQUIN CO.—**O. H. Chain,** Elks Bldg., Stockton—$94,979 for constr. of one-story, frame and stucco school bldg. addition, Hazelton Elementary School, Stockton — by City Unified School District, Stockton. 4-14

SAN JOAQUIN CO. — **MacDonald, Young & Nelson,** 127 Montgomery St., San Francisco—$139,717 for constr. of 3, Butler type metal rigid frame, bldgs., Naval Reserve Armory, adjacent to former Pollock Shipyard, Stockton—by Bureau of Yards & Docks, Washington, D. C. 4-14

SAN MATEO CO. — **Russell A. Cullen, Inc.,** 478 Jackson St., San Francisco—$125-791 for constr. of one-story, steel and wood frame school bldg., Wm. H. Taft Grammar School, Redwood City—by City Elementary School District, Redwood City. 4-15

SAN MATEO CO.—**Peter Sorensen,** 927 Arguello St., Redwood City—$131,050 for constr. of one-story steel and wood frame school bldg., James Monroe Grammar School, Redwood City—by City Elementary School District, Redwood City. 4-15

SANTA CLARA CO.—**Carl N. Swenson Co.,** Box 558, San Jose—$92,174 for constr. of one-story, reinf. conc., steel, wood frame school bldg. at Jefferson Union Elementary School, Santa Clara — by School Board, Santa Clara. 4-2

SOLANO CO.—**James Bitcon,** 628 Louisiana St., Vallejo—$100,000 for constr. of reinf. stucco, synagogue, Nebraska St., betw. Calaveras and Shasta St., Vallejo—by Sons & Daughters of Israel, Vallejo. 4-16

SOLANO CO.—**Stolte Inc., & Morrison-Knudsen Co., Inc.,** Box 1-A, Fairfield—$3,000,000 for constr. of foundations for 4-story and basement, reinf. conc. base hospital, nurses quarters, library, auditorium, gym, freight elevator and post exchange at Army Air Base, Fairfield—by Corps of Engineers, Sacramento. 4-4

YOLO CO.—**Moore & Roberts,** 693 Mission St., San Francisco — $310,037 for constr. of 2-story, reinf. conc. plant sciences bldg., Unit K, Davis Campus, Davis—by Board of Regents, University of California, Berkeley. 4-4

YOLO CO.—**Clem Anderson,** 2048-A Lincoln Ave., Alameda—$89,148 to move and re-erect 3 dormitories, from Benicia to Davis Campus, Davis—by Board of Regents, University of California, Berkeley. 4-29

Colorado

DENVER CO.—**Dutton, Kendall & Hunt, Inc.,** 4515 Garfield St., Denver — $55,000 for constr. of one-story addition to packing plant, 901 E. 46th Ave., Denver—by Pepper Packing Co., Denver. 4-1

DENVER CO.—**Northwestern Engineering Co.,** Box 567, Denver—$123,021 to convert 9 barracks bldgs. to 36 apartments, Lowry Field, Denver—by Corps of Engineers, Denver. 4-1

GARFIELD CO.—**Gardner Construction Co.,** Glenwood Springs—$183,000 for general constr. of brick high school bldg., Rifle—by Board of Education, Rifle. 4-2

Montana

DAWSON CO.—**John Sterhan,** Glendive—$96,500 for constr. of shop and office bldg. at Glendive—by State Highway Commission, Helena. 4-1

New Mexico

BERNALILLO CO.—**John T. Testman,** 3443 Floral Dr., Albuquerque—$136,927 for constr. of Naval Reserve Armory, Albuquerque—by Bureau of Yards & Docks, Washington, D. C. 4-21

Oregon

MARION CO. — **Guy F. Atkinson Co.,** Cascade Bldg., Portland — $526,500 for constr. of reinf. conc. 3-story and basement main bldg. and 4 wings, 12th and State Sts., Salem—by Board of Regents, Willamette University, Salem. 4-8

MARION CO.—**Halvorsen Construction Co.,** 1905 N. Commercial St., Salem—$129,960 for general constr. of receiving and processing plant, Salem—by Salem Nut Growers Cooperative, Salem. 4-16

Texas

BEXAR CO. — **Becher & Becher,** 1000 Austin St., San Antonio — $150,141 to constr. 16-room elementary school bldg., San Antonio—by Harlandale Independent School District, San Antonio. 4-28

DALLAS CO. — **Carpenter Bros.,** 1335 Plowman St., Dallas—$750,000 for constr. of apartment bldgs. at Plowman and Tilden Sts., Dallas—by self. 4-28

EL PASO CO.—**Ponsford Bros.,** Box 1412, El Paso—$373,115 to convert bldgs. at Wm. Beaumont General Hospital into apartment units, El Paso—by Corps of Engineers, Albuquerque, New Mexico. 4-16

NUECES CO. — **D. V. Copus,** Medical Professional Bldg., Corpus Christi—$235,000 to install storm sewers, grade, pave, constr. curbs and gutters, etc., Lindale Addition, Corpus Christi—by G. R. Swanter, Corpus Christi. 4-16

YOAKUM CO.—**B. M. F. P. Construction Co.,** Denver City — $274,875 for general constr. of school bldg., Denver City—by Sligo School District, Denver City. 4-28

Washington

GRAYS HARBOR CO.—**Grays Harbor Construction Co.,** 412 S. Park St., Aberdeen — $196,289 for constr. of 3 prefab. warehouse bldgs. connected by one-story frame struct., Naval Reserve Armory, Aberdeen—by Bureau of Yards & Docks, Washington, D. C. 4-30

KING CO. — **Casey Construction Co.,** Lowman Bldg., Seattle — $100,000 for constr. of one-story addition to service and repair bldg. at 1016 Airport Way, Seattle—by Lee & Eastes, Seattle. 4-2

KING CO.—**Sound Construction Co.,** 4103 W. 45th, Seattle — $514,726 for general constr. of electrical engineering bldg. on campus, University of Washington, Seattle — by Board of Regents, University of Washington, Seattle. 4-5

SPOKANE CO.—**Walter G. Meyers,** Spokane—$620,987 general constr. of 66-bed wing, hospital addition, Edgecliff Sanatorium—by County Commission, Spokane. 4-10

Canada

BRITISH COLUMBIA—**Dominion Company, Ltd.,** Vancouver—$250,000 for constr. of 5-story bldg., and additions to present bldg. at 622 Granville St., Vancouver, B. C. —by Saba Bros., Ltd., Vancouver. 4-3

Miscellaneous . . .

New Mexico

BERNALILLO CO.—**Robert E. McKee,** 4700 San Fernando Rd., Los Angeles, Calif. —$2,319,388 for constr. of 7 bldgs., sewer, gas, water systems, grade and pave, etc., at Sandia Base, Albuquerque—by Corps of Engineers, Albuquerque. 4-8

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

Ray W. Turnbull, president of HOTPOINT, INC., succeeds **Raymond M. Alvord** as the GENERAL ELECTRIC CO. commercial vice-president for the Pacific district with headquarters in San Francisco, it was announced recently. Alvord will retire at his own request on September 30th after 43 years of service with the company. Turnbull has been associated with the electrical appliance business since 1909, and has been president of Hotpoint, Inc., a GE subsidiary, since 1941.

☆ ☆ ☆

Completion of modern new San Francisco offices at 400 Alabama St. was announced recently by the PACIFIC COAST AGGREGATES, INC., largest organization of its kind in Northern California. More than 100 PCA employees will be housed in the reinforced concrete building, one of 48 offices, plants and warehouses which are located throughout northern California. Soundproof and fireproof, the building incorporates many new features, including a specially designed ventilation system which automatically controls the temperature of the building. A modern lunchroom adjoins the engineering division, located in the building's penthouse.

☆ ☆ ☆

Plans for erection of a Fiberglas factory on the recently-purchased 42-ac. plant site in Santa Clara, Calif., were announced recently by OWENS-CORNING FIBERGLAS CORPORATION, Toledo, O. Site is in the Pasetta industrial tract at the intersection of Kifer Rd. and the Santa Clara-Alviso Road. No date for the start of construction has been set, but the plant is being designed to provide approximately 500,000 sq. ft. of manufacturing and warehousing space, designed to meet the needs of West Coast builders and contractors for Fiberglas products.

☆ ☆ ☆

Representatives from the Mack Western Division now in the east receiving special training include: **C. E. Cole,** assistant manager, Los Angeles; **George P. Anderson,** wholesale manager, Los Angeles, and **S. V. Trent,** Salt Lake City district manager.

☆ ☆ ☆

Consolidation of the Reinforcing Steel Division, the Structural Steel Division, the Crane Division, and plants and general offices was recently announced by JUDSON PACIFIC-MURPHY CORPORATION. New address for the corporation is 4300 Eastshore Highway, Emeryville, Calif.

☆ ☆ ☆

Opening of complete branch headquarters in Los Angeles was announced recently by the PENNSYLVANIA FLEXIBLE METALLIC TUBING COMPANY of Philadelphia. Center of the company's Pacific division, it will include a large warehouse with complete inventory on hand and sales office.

☆ ☆ ☆

Appointment of **E. C. Herron** as manager of the GENERAL ELECTRIC COMPANY's South Pacific sales district in Los Angeles was announced recently by **M. L. Sloan,** vice-president and general manager. Herron, who has been associated with the lamp business since 1918, succeeds **E. P. Markee** who passed away February 2.

☆ ☆ ☆

New factory branch facilities are under construction at Sacramento for the FRUEHAUF TRAILER COMPANY. Located on U. S. Highway 40, the concrete and steel building will be on a 17-ac. site and occupy approximately 40,000 sq. ft. of floor space, largest in the Sacramento territory. Equipment will feature all modern devices, including provision for "shot" welding stainless steel, an exclusive feature. **Otto P. Bammer** will be branch manager of the organization, which will employ almost 100 people, while **Harold Bauer** will be sales manager.

☆ ☆ ☆

Carl R. Chrisco is the newly appointed office manager of the San Francisco sales branch of the WESTERN MACHINERY COMPANY, it was announced by **G. G. Curto,** San Francisco branch manager. Chrisco, who was previously employed by Bethlehem Steel Co., takes over duties of giving increased service to WEMCO customers and promoting the sale of the company's complete line of nationally-known construction equipment brands.

☆ ☆ ☆

Final approval on plans for restoring and modernizing the Los Angeles plant of the MACK INTERNATIONAL MOTOR TRUCK CORPORATION was received by **J. C. Rowold,** western division vice-president during his visit to the company's general headquarters in New York. Six to eight months is the expected time required to complete construction on the plant, which contains 300,000 sq. ft. of working space. A new West Coast model Mack truck is expected to be ready for June shipment also. Especially adaptable to West Coast requirements, the truck embodies features which were approved and decided upon after a long study by plant engineers.

☆ ☆ ☆

Reginald C. Cushing will make his headquarters at the MINNEAPOLIS-HONEYWELL REGULATOR CO.'s San Francisco office after his recent appointment as sales manager of the air conditioning controls division for the Pacific region. Cushing, who joined the company in 1935, worked closely with the United States Army during the war in the design and installation of aircraft engine test cells.

☆ ☆ ☆

THE SANTA FE TANK AND TOWER CO., with headquarters in Los Angeles, announces the addition of **Harold A. Dresser** to its engineering staff. Dresser, who has been associated with the cooling equipment industry since 1926, has taken over the cooling equipment division of Santa Fe as part of a comprehensive expansion program. Nationally recognized as one of the foremost authorities in the cooling equipment industry, Dresser for the past 15 years has been associated with the National Gasoline Association.

☆ ☆ ☆

WESTINGHOUSE ELECTRIC CORP. recently announced the appointment of **R. A. Neal,** vice-president, formerly of Pittsburgh, Pa., as general manager of the company's Pacific Coast district operations, with headquarters in San Francisco. Neal's appointment in no way changes the duties or responsibilities of **Chas. A. Dostal** of San Francisco, vice-president in charge of sales for the Pacific Coast district, or of others now in the

ON HAND to inspect the 5000th Tournapull as it came off the production line at the Peoria, Ill., plant are S. D. MEANS, domestic sales manager; O. W. NELSON, vice-president and general manager; and P. E. FULFORD, export manager of R. G. LeTourneau, Inc. Model shown above is one of a complete new line of electrically-controlled Tournapulls. Tournapulls have been produced since the year 1938.

company's employ in this district. Neal, whose appointment is dictated solely by the expansion of Westinghouse's western operations, has been with the company for 37 years. Westinghouse has just completed lease arrangements to operate the 57-ac. Sunnyvale, Calif., works formerly operated by the Joshua Hendy Iron Works.

☆ ☆ ☆

Winchester King was recently selected as district representative in northern California, Utah and Nevada for LAPLANT-CHOATE MANUFACTURING CO., according to announcement of **S. I. Harris,** company western division sales manager. King, who was formerly with the Pacific Coast Engineering Co., Alameda, Calif., is a registered mechanical engineer and will make his headquarters in LaPlant-Choate offices at Oakland, Calif.

☆ ☆ ☆

R. D. Paine takes over the position of manager of the GENERAL ELECTRIC COMPANY's Oakland Lamp works, succeeding **H. H. Barrows** who retired after almost 40 years of service with the company. Paine has been cost engineer with Lamp Manufacturing at Nela Park prior to his recent appointment.

☆ ☆ ☆

C. D. D'Amico was recently appointed manager of the Special Steels Department at the Los Angeles plant of JOSEPH T. RYERSON & SON, INC., steel distributors, it was announced by **F. A. Purdy,** plant manager. He is in charge of sales of alloy and stainless steels. Active in metallurgical circles on the West Coast, D'Amico has been plant metallurgist of the Vulcan Steel Foundry Co., Oakland, Calif., and later as chief metallurgist at the Joshua Hendy Iron Works, Sunnyvale, Calif.

☆ ☆ ☆

The EDWARD R. BACON COMPANY, San Francisco, is enlarging their customer field service staff with the addition of four experienced men, under the direction of **Willard Kidder,** according to an announcement by **Jack How,** general manager. **John Lyon, Al Koehn** and **W. Matthews** will be under Kidder's supervision. Kidder has been with Erbco since 1945, and has had previous service with Sullivan Machine Co., Empress Gold Mines, and Idaho-Maryland Gold Mining Co., as well as having seen naval service in both world wars.

☆ ☆ ☆

MACK-INTERNATIONAL MOTOR TRUCK CORP., with western division headquarters in Los Angeles, recently announced that plans are nearing completion for the construction of a new Mack branch building in Sacramento. The ground area will be approximately 40,000 ft., with about 25,000 ft. of building space, on which will be erected a modern truck sales and service station. Schedule calls for completion of the building by midsummer.

☆ ☆ ☆

ENGINEERING CONTROLS, INC., is the new corporate name of the firm which, for many years, has operated internationally under the name Pacific Enterprise Products Co. **Lloyd C. Harbert,** formerly vice-president and general manager, becomes president of the new corporation, with **William G. Corey,** consulting engi-

neer of Los Angeles as vice-president in charge of engineering and **Forrest W. Monroe** as secretary-treasurer. Plans for greatly expanded plant facilities are also included in the reorganization. Main office continues in Los Angeles. A new line of Control products—standard, electronic and special models—are also being introduced. Trademarked "E-C", they include a complete line of Automatic Engine Controls actuated by pressure, liquid level, power failure, power demand, temperature, etc.

☆ ☆ ☆

Frank Potts is new export sales manager for the PERMANENTE CEMENT CO., according to a recent announcement. Potts has had experience in the general export sales department of several Henry J. Kaiser-managed companies, a department which has been decentralized because of increased business in each of the company's fields. He will have offices in Oakland, Calif., and will report to the general sales manager, **James K. Beatty.** At the same time, announcement was made of the appointment of **W. J. Gleason** as export sales manager of Kaiser Company, Inc., Iron and Steel Division. Gleason formerly headed the centralized general export sales department serving the Kaiser organization.

☆ ☆ ☆

After 42 years of continuous service with the GENERAL ELECTRIC COMPANY, **S. E. (Sam) Gates** retired recently, according to announcement by **A. G. Jones,** San Francisco Pacific district manager for the GE Company's apparatus department. **G. F. Maughmer** will succeed Gates as manager of the company's Los Angeles apparatus department. He has been his assistant since April, 1945. Gates has been in the Los Angeles General Electric office since April, 1924, prior to which he served in the Spokane, Wash., office as manager. He has been extremely active in civic groups as well as in engineering and technical societies during his residence in the southern city.

☆ ☆ ☆

Peter Colefax, former executive vice-president of the AMERICAN POTASH & CHEMICAL CORP., with headquarters in Los Angeles, was recently elected president of the organization at the regular monthly meeting of the board of directors in New York. Colefax, who has been with the company since 1935, succeeds **Frederic Vieweg,** who resigned shortly before his death March 3. Vieweg had been with the company for 28 years.

☆ ☆ ☆

Personnel changes at THOMPSON TIRE CO., San Francisco, include appointment of **C. C. Combellack,** former sales manager, to the position of vice-president and general manager. **R. E. Worth** was upped to the position of assistant manager, while **H. C. Hepler** replaces Worth as service manager. **Vernon Sanders,** recently released from the army, returns to become secretary-treasurer of the organization.

☆ ☆ ☆

PACIFIC NORTHWEST

Clay Lilleston, who has been associated with THE PARAFFINE COMPANIES, INC. since 1930, was recently promoted to the post of Pabco northern district manager, Building Materials division, with headquarters in Seattle, Wash. Paraffine is one of the country's leading manufacturers of paint, roofings, linoleum and other building materials.

☆ ☆ ☆

Richard A. Colgan succeeds **Wilson Compton** as chairman of the Lumber Survey Committee, it was announced recently by Secretary of Commerce **W. Averell Harriman.** Compton is now president of the Washington State College at Pullman, Wash. Colgan is executive vice-president of the National Lumber Manufacturers Association with headquarters in Washington, D. C.

☆ ☆ ☆

PADDOCK EQUIPMENT CO., distributors of SEAMAN tillers in southeastern Washington and eastern Oregon, have opened a branch office in Walla Walla, Wash. The company has offices in La Grande and Ontario, Ore.

☆ ☆ ☆

SUTHERLAND READY-MIX CO. will open its new concrete truck mix service in Pullman, Wash., this month. The company is headed by **R. H. Sutherland** of Colfax, Wash., and **Claude Irwin** of Pullman.

☆ ☆ ☆

H. G. Wallis has been appointed market research representative for the Washington division of the GENERAL PETROLEUM CO. with headquarters in Seattle. Wallis was recently released from active duty with the army after having spent six years as colonel in the Chemical Warfare Service.

☆ ☆ ☆

Roland Maus, formerly sales manager of Valdura division of the AMERICAN-MARIETTA COMPANY, and **E. Emerson Brott,** former vice-president and general manager of the SCHORN POINT MANUFACTURING CO. of Seattle, a division of American-Marietta, were recently elected to vice-presidencies in the

parent company. Maus is in charge of sales of the Valdura division and also of the company's newly acquired Pacific Chemical Co., Los Angeles. His headquarters are in Chicago. Brott will be in charge of the entire Pacific Northwest operations of the paint manufacturers. He has been associated with the paint business since 1923.

☆ ☆ ☆

INTERMOUNTAIN

K. J. King is the new manager of the Denver branch office of the WESTERN MACHINERY COMPANY, with offices at 1004 Speer Blvd. King has formerly been assistant sales manager and office manager of the company's San Francisco sales office, and is thoroughly familiar with mining, industrial and construction equipment. The company also has a Western-Knapp Engineering Co. division who design and construct industrial and metallurgical plants.

☆ ☆ ☆

PIONEER ENGINEERING WORKS, INC., Minneapolis, Minn., recently appointed two new Montana distributors of the complete line of Continuflo equipment featuring complete sales and service to contractors and producers of all kinds of aggregates. CENTRAL MACHINERY CO., Great Falls, will serve the northwestern part of the state and WORTHAM MACHINERY CO., Billings, the southwestern area.

☆ ☆ ☆

The DART TRUCK DISTRIBUTORS recently opened offices in Phoenix, Ariz., representing the Dart Truck Co., Kansas City, Mo., builders of heavy-hauling trucks since 1908. **J. D. Williams,** long familiar with the trucking business, operates the Arizona plant at 3958 S. Central, while his partner, **E. I. Barnett,** manages the California division in Los Angeles. Dart Trucks are custom built to the purchasers' own specifications. Operations have expanded into California, Nevada, New Mexico, West Texas, and Utah.

☆ ☆ ☆

R. L. Stevenson, formerly engaged in sales work in the Chicago area for SCHRAMM, INC., West Chester, Pa., manufacturers of portable and stationary air compressors, was recently transferred to Salt Lake City, Utah, with headquarters at 212 Beason Building. In his new capacity he will be engaged in the sale of Schramm compressors in a territory including Colorado, Utah, Wyoming and Idaho.

☆ ☆ ☆

Robert L. Miller, previously assistant sales manager of the Road Machinery division of THE HEIL CO., Milwaukee, Wis., is the new district sales manager for all Heil products in the central states of Iowa, Missouri, Nebraska, Kansas, and Colorado, with headquarters at Kansas City. Well-known to construction equipment distributors, Miller has been with the Road Machinery division since its inception nearly 12 years ago. In his new position he will take over management of the district office at Kansas City, one of the nine similar offices set up to assist distributors of Heil products.

☆ ☆ ☆

Appointment of **Leonard C. Andersen** as district manager of District 8, covering the southwest states of California, Arizona and Nevada was announced recently by THE HEIL CO., Milwaukee, Wis. Andersen, who has been sales coordinator of the company's six divisions for the past four years, will have his headquarters at Los Angeles. **Karl Mindemann,** member of the company for ten years, will take over as sales coordinator in Milwaukee.

☆ ☆ ☆

AMONG THE MANUFACTURERS

Production has started at the new Kansas City, Kans., Fiberglas plant, according to recent announcement by the OWENS-CORNING FIBERGLAS CORP. Heretofore the manufacture of this item, nationally distributed by Armstrong Cork Co., The Flintkote Co., and the U. S. Gypsum Co., has been centered in Newark, Ohio.

General sales, credit and accounting departments of the LINK-BELT SPEEDER CORPORATION were recently transferred from Chicago to 1201 Sixth Street S.W., Cedar Rapids, Iowa.

☆ ☆ ☆

TRUSCON STEEL CO., Youngstown, Ohio, recently purchased the portion of Knapp Brothers Manufacturing Company's facilities which manufactures plastering accessories. Bull Nose and Scalloped Edge Corner Beads, Special Base Grounds and Screeds, Picture Mold Casings, Fittings and other plastering items are included. The equipment and dies are being moved from Joliet, Ill., to the plant at Youngs-

town. Acquisition of these products now give the Truscon Steel Co. a more complete line of plastering accessories to supplement their present line.

☆ ☆ ☆

L. M. Morley was elected vice-president of the MINNEAPOLIS-HONEYWELL REGULATOR CO., Minneapolis, Minn., according to announcement by President **Harold W. Sweatt.** Morley, who is vice-president in charge of sales for the Brown Instrument Co., a Honeywell subsidiary at Philadelphia, will continue in that capacity, also. His promotion makes him an officer of the parent company as well as its subsidiary, however. Morley joined the Brown Company in 1919.

☆ ☆ ☆

Sigurd Carlson, assistant general passenger agent for the SANTA FE RAILWAY in Topeka, Kans., has been named general passenger agent at Los Angeles, succeeding **Ross E. Chappell.** Chappell transfers to Topeka as passenger traffic manager in place of **R. T. Anderson,** who was promoted to assistant general passenger traffic manager at Chicago. Carlson and Chappell have both been with the company since 1920.

☆ ☆ ☆

Robert C. Lewis is newly-appointed installation manager for R. G. LETOURNEAU, INC., Peoria, Ill., it was announced recently. Field engineering work, supervision of plant engineering projects, test farm, and distributor personnel sales training programs will all be part of his new position. Lewis was with the U. S. Army Engineers for five years, serving in the American and Southwest Pacific theaters. At the same time, announcement was made of the addition of **Keith Thompson** to the Installation department in the capacity of applications engineer. Thompson has been a LeTourneau Service engineer for the past 7 years.

☆ ☆ ☆

O. A. "Jack" Williams and **A. M. "Monte" Newman** were among recent appointees to new positions with R. G. LETOURNEAU, INC., Peoria, Ill., in the Western sales area. Williams, formerly district representative for LeTourneau, is

WILLIAMS NEWMAN

now Western sales manager, with headquarters at the company's Stockton office. He replaces **E. M. Ferguson,** who is now Eastern sales manager in Washington, D. C. Newman, who has been with LeTourneau since 1932, has been named chief service engineer for the Western area, with headquarters at Stockton also.

☆ ☆ ☆

Announcement was made recently of the appointment of **Harry B. Cummings** as manager of the tar department of the Tar Products Division of KOPPERS COMPANY, INC., with headquarters in Pittsburgh, Pa. Cummings takes over direction of the production and sale of various tar products, including road and roofing materials, preservatives, pitches, acids, bases, and other products. He was previously executive assistant to the officials of the Wailes Dove-Hermiston Corp. of Westfield, N. J., a wholly owned subsidiary of Koppers Company, Inc.

☆ ☆ ☆

Personnel changes in branch management of the INTERNATIONAL HARVESTER COMPANY included appointment of five assistant branch managers and one manager. Changes listed are: **W. F. Schaeffer,** formerly retail motor truck manager at Shreveport, La., and now assistant manager at that branch. **M. R. McClure** is new assistant manager at the Fort Dodge, Iowa, branch, while **H. T. Rosell** was appointed assistant manager at the Dallas motor truck branch. **R. G. Walls,** former retail motor truck manager at Atlanta, Ga., is now in New Orleans, La., as assistant manager for the motor truck branch there. **G. B. Healey,** previously retail manager at Eau Claire, Wis., is now assistant manager at the Davenport motor truck branch, and **J. D. Richardson,** formerly assistant manager at Omaha, Nebr., is now manager of the newly established Omaha motor truck branch.

☆ ☆ ☆

Promotion of **V. E. McMullen** to executive vice-president of the CUMMINS ENGINE CO., INC., Columbus, Ind., builder of high speed diesel engines, was announced recently by **Hugh Miller,** chairman of the

company's board of directors. **R. E. Huthsteiner** moves up to McMullen's former position of vice-president and general manager. Simultaneously, the appointments of **Leonard W. Beck** as general sales manager and **Waldo M. Harrison** as controller were announced.

☆ ☆ ☆

Announcement was recently made of the appointment of **Ralph D. Holcomb** as general sales manager for the HARNISCHFEGER CORPORATION, Milwaukee, Wis., builder of P&H products. Holcomb,

a veteran of 18 years continuous service with the company, will direct the sales of all P&H products, excavators, road machinery, hoists, cranes and welding equipment. Prior to his promotion, he was district manager for the San Francisco territory.

☆ ☆ ☆

J. F. Linthicum, president of the AMERICAN LUMBER & TREATING COMPANY, Chicago, recently announced that production of fire, termite and rot resistant wood at the company's nine plants during 1946 exceeded by more than 52 per cent the amount of lumber treated during the previous year. Production for 1947 was expected to reach an all-time high, it was stated. Operation of a new pressure-treating plant at Baltimore, Md., was started in February, and bids were received Feb. 15 on the construction of another plant at Everett, Wash.

☆ ☆ ☆

Steel drums are now in production at the new Rheem-Hume Singapore plant, according to word received by **R. S. Rheem**, president of the RHEEM MANUFACTURING CO. Heavy orders from the petroleum, latex and other industries have booked the plant's entire output for the remainder of the year. Rheem is now manufacturing steel drums in five foreign locations—Singapore, Rio de Janeiro and Sidney, Melbourne and Brisbane, Australia.

☆ ☆ ☆

New director of factory sales for GAR WOOD INDUSTRIES, INC., is **E. B. Hill**, former district manager of the general line. In his new position, Hill will supervise all factory sales activities, including those of the company's Buckeye Traction Ditcher and St. Paul Hydraulic Hoist divisions. He has been with the company since 1925. Three other appointments were announced at the same time. **Nick Etten**, first baseman of the New York Yankees, is assistant to the manager in Gar Wood's Chicago branch. He will return to the Yankees when the baseball season begins. **Ben C. Helm** was appointed to Hammond's staff, while **William H. Lingner**, formerly with the hoist and body sales department, has been appointed assistant manager of the Gar Wood San Francisco branch.

☆ ☆ ☆

Appointment of **M. E. Army** and **Ralph Rodgers** as assistant district managers of the Pacific Coast district was announced recently by the SHOVEL AND CRANE DIVISION of LIMA LOCOMOTIVE WORKS, INC., Lima, O. Army will continue to make his headquarters with Smith Booth Usher Co., Los Angeles, and Rodgers will have his office with **Paul Fenwick**, district manager for the Lima company with offices in San Francisco. Both Army and Rodgers have been associated with the organization for several years in the capacity of sales and service engineers.

☆ ☆ ☆

YEOMANS BROTHERS CO., Chicago, Ill., have acquired a license to promote and sell the Aero-Filter (Halverson-Smith) process of biological treatment using high capacity trickling filters. The Aero-Filter completes the Yeoman's line of sewage equipment to the extent that all equipment for most types of plants are now available from one manufacturer.

☆ ☆ ☆

Harry G. Podlesak, veteran of many branches of the engineering field, has been appointed executive engineer for the

KRAFT FOODS COMPANY, it was announced by **G. C. Pound,** executive vice-president of the company. Before beginning his association with Kraft, Podlesak was plant manager for body building and final assembly in the Chevrolet Cleveland division of General Motors Corp.

☆ ☆ ☆

A new parts inventory program, to be called "inventory management" has just been announced for the 142 distributors of INTERNATIONAL HARVESTER CO. Industrial Power by **W. W. Black,** supervisor of the company's service and parts section of the industrial power division. Inventory management is a "control" program designed to maintain a 60-day bank of service parts in the parts department of industrial power distributors. Another goal of the program is a four-times-a-year turnover of parts inventory. Service parts managers are to attend the Harvester Company's Central School for Sales Personnel in Chicago in groups of 25 for a week's instruction.

☆ ☆ ☆

Six executive changes in the Holyoke, Mass., branch of the WORTHINGTON PUMP & MACHINERY CORP. were recently announced by **Herman J. Schorle,** branch works manager. **A. W. Soutter,** formerly engineering assistant to the works manager, has been appointed purchasing engineer of the Holyoke Works, while **E. E. Foote,** formerly purchasing agent, was named assistant to the purchasing engineer. **O. J. Schorer,** formerly chief engineer of the Rock Drill & Air Tool division, has been appointed engineering assistant to the works manager, while **P. H. Nast** takes over Schorer's former job. **F. G. Riedel,** who was chief engineer of the Air Conditioning & Refrigeration division and works director of all research, is now chief engineer of the Freon Compressor division, retaining his title of works director of all research. **Justin Neuhoff** takes over his former job of chief engineer of the Air Conditioning and Condensing Units division.

☆ ☆ ☆

Henry Rowold recently assumed the duties and title of assistant general sales manager of MACK-INTERNATIONAL MOTOR TRUCK CORPORATION, it was announced by **A. C. Fetzer,** vice-president and general sales manager. Rowold, also a vice-president of the company, combines his new activities with those of national accounts manager, a position he has held for some time.

☆ ☆ ☆

For having the best safety record of the heavy industries division for 1946, LIMA LOCOMOTIVE WORKS, INC., Lima, Ohio, was recently awarded a certificate of merit by the Industrial Commission of Ohio, Division of Safety and Hygiene. Award was presented by James H. Fulker, superintendent of the division of Safety and Hygiene, at the 16th annual Allen County Safety Award Dinner.

☆ ☆ ☆

Announcement was made recently of the appointment of **M. V. Cornell** as sales manager of MARION POWER SHOVEL COMPANY, Marion, O. He succeeds **Walter N. Westland** who recently resigned to join the sales organization of the CUMMINS ENGINE CO., INC. Cornell has been associated with the company since 1938, a period which was interrupted by three years of military service. During most of that period he served as a lieutenant, senior grade, attached to ships of the 7th fleet.

☆ ☆ ☆

DIESEL ENGINE MANUFACTURERS ASSOCIATION recently announced an intensive, one-week educational conference for college and university professors who teach Diesel engineering to be given in Chicago during the week of June 23. The conference, with fifty professors from all sections of the country in attendance, will combine tours of Diesel engine factories, visits to mechanical engineering school laboratories, and classroom lectures, and will be the first of its type ever to be given. The General Motors plant at La Grange and the International Harvester Company in Chicago will be visited by the delegation.

☆ ☆ ☆

Net 1946 sales of FAIRBANKS, MORSE & CO. totaled $56,551,298.76, an all-time high for the company's peacetime volume, it was declared in the firm's annual report to the stockholders. Net profit for the year after taxes was $3,079,135.20, or $5.14 per common share as compared with $4.34 per share earned in 1945. This was accomplished in spite of strikes at the Beloit, Wis., and Three Rivers, Mich., plants early in 1946.

☆ ☆ ☆

George W. Kelsey, director and general sales manager of BUILDERS IRON FOUNDRY, Providence, R. I., was named vice-president of the organization following the February meeting of the board of directors, according to announcement by President **Henry S. Chafee.** A member of the American Society of Mechanical Engineers, Kelsey came to Builders Iron Foundry in 1938 from the U. S. Steel Corporation.

☆ ☆ ☆

Russell DeYoung was named vice-president in charge of production and a member of the board of directors of the GOODYEAR TIRE AND RUBBER CO., according to recent announcement by **P. W. Litchfield,** chairman of the board. DeYoung succeeds **Cliff Slusser,** who recently resigned his position. Slusser will continue as vice-president and general manager of the subsidiaries which operate Goodyear's textile mills and coal mines, however. **Fred W. Climer** was also elected to the new Goodyear position of vice-president in charge of industrial relations.

☆ ☆ ☆

Six directors were recently elected to the board of the AMERICAN STANDARDS ASSOCIATION, it was announced by **Frederick R. Lack,** president of the association, and vice-president in charge of the radio division of Western Electric Co. Newly elected directors are: **R. L. Pearson,** representing the Association of American Railroads; **Curtis W. Pierce,** representing the fire protection group; **J. H. Hunt,** representing the Society of Automotive Engineers; **J. H. McElhinney,** representing the American Iron and Steel Institute; **R. Oakley Kennedy,** who represents general consumer interests on the board; and **Auguste G. Pratt,** who represents the American Society of Mechanical Engineers.

NEW EQUIPMENT

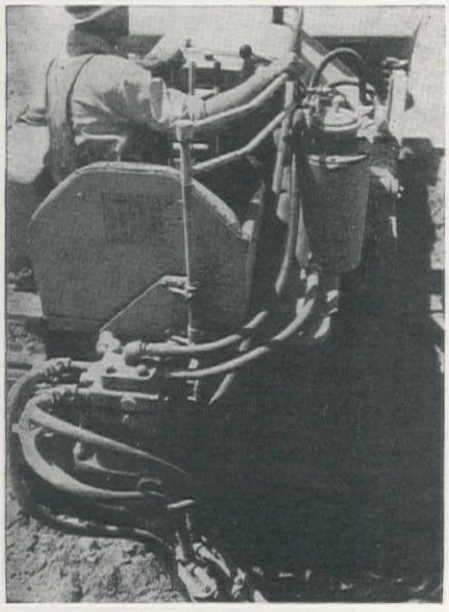
MORE COMPLETE information on any of the new products or equipment briefly described on these pages may be had by sending your request to the Advertising Manager, Western Construction News, 503 Market Street, San Francisco 5, California.

New Hydraulic Units for Tractors

Manufacturer: LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa.

Equipment: Hydraulic units for small tractors.

Features claimed: Designed for hooking into existing hydraulic systems on D-2 and D-4 tractors, these new units make it possible to operate a 2- or 4-yd. scraper in combination with present dozers, without



having to purchase an additional hydraulic system for scraper operation. These conversion units are available in two designs—one for adapting the 2-yd. LaPlant-Choate scraper to present D-2 hydraulic dozers and the other for adapting the 4-yd. scraper model to D-4 dozer units. Hook-up of either arrangement is a simple job and can be done without special tools.

New Compressor

Manufacturer: Schramm, Inc., West Chester, Pa.

Equipment: Schramm Model 105 compressor.

Features claimed: Equipped with a U-6

International Harvester gasoline engine, with bore and stroke of 3⅞ in. x 5¼ in., the new compressor is designed for work requiring quick handling to and from the job. Actual air delivery is 105 cu. ft. of air. The trailer type mounting is provided with a Universal coupling or towing ring for connection to car or truck, for hauling at maximum towing speeds. It can be easily handled by one man.

Materials Handling Machine

Manufacturers: Mixermobile Manufacturers, Portland, Oregon.

Equipment: Power steering materials handling machine.

Features claimed: The addition of power steering and an enclosed cab have been announced as new optional equipment on the standard model Scoopmobile, a tricycle type materials handling machine designed to handle virtually any type of material. The Vickers hydraulic system of power steering is claimed to give absolute operation, and efficiency of the Scoopmobile has

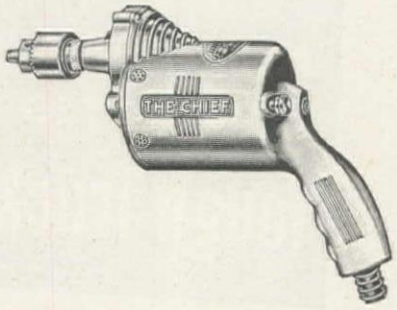
increased tremendously with its addition. The enclosed cab may be added for the comfort and protection of the operator, and features deluxe, full size upholstered seat, windshield wiper, and large safety plate windshield. Both sides of the new cab have doors that may be latched open in warmer weather. Visibility has not been impaired.

Portable Electric Drill

Manufacturer: Chicago Precision Machine Co., Chicago, Ill.

Equipment: Lightweight electric drill.

Features claimed: The "Chief" Drill, Model 63, weighing only 3¾ lb., is claimed to reduce operator fatigue and simplify ease of handling through balanced construction.



Specifications are as follows: Drills up to ¼-in. in steel and up to ½-in. in wood; equipped with three-jaw Jacobs Chuck with key; easy-reach finger point switch; comfortable pistol grip; 12 ft. of rubber cable; free speed 2000 r. p. m. Operates on 110-volt, AC-DC.

New Electrode

Manufacturer: Air Reduction Sales Co., New York, N. Y.

Equipment: New electrode for machinable welds.

Features claimed: The Airco No. 375 electrode for machinable welds on cast iron has a high nickel core wire and a heavy extruded coating that has a possible application wherever an electrode is used on cast iron. Because of the high nickel content, the electrode flows exceedingly well and resultant deposit is sound. Weld and fusion zone is soft and easy to machine, and it will also withstand hydrostatic pressure and may be used with ease in the downhand, vertical or overhead positions. Ordinarily preheating is not necessary.

Prefabricated Steel Building

Manufacturer: Soulé Steel Co., San Francisco, Calif.

Equipment: Factory prefabricated, steel utility building.

Features claimed: Suitable for use as warehouses, machine shops, equipment storage, garages, and other industrial building needs, this mass-produced building is quick to erect, and has high uniform head room. Corrugated APS plastic-covered Plasteel sheets are used as covering for roof, sidewalls and door leaves of the building. Plasteel is a combination of a special asphaltic plastic and pure mineral mica scientifically bonded to both sides of the steel sheeting, and is reported to withstand even the effects of sea spray. It is also claimed that no periodic or maintenance painting is needed.

Interior of the standard 40 x 100-ft. Soulé

Steel utility building shows 4,000 sq. ft., unobstructed by interior columns. Sidewalls are 14 ft., with 21-ft. ridge height. Each sidewall is made up of 5 sections, two of which are solid and three containing 6 ft. 8⅞ in. wide by 4 ft. 1 in. high windows. Door is a horizontal two-leaf sliding type, 12 ft. wide by 14 ft. high. All parts are easily numbered for identifications, and quick and easy erection is facilitated. The utility building is shipped complete with framing, sidewalls, roof, anchor bolts, frame bolts, straw nails and hardware for doors and windows. The company does not supply concrete foundations or floors, or glass for windows.

Liquid Rust Remover

Manufacturer: Allied Products Co., Chicago, Ill.

Equipment: New liquid rust remover.

Features claimed: A new development in the corrosion control field, CorOdex claims to remove even the thickest coat of rust on any metal surface. Applied in a minimum of time with a paint brush or cotton swab, it reaches pin point spots, pits, crevices and

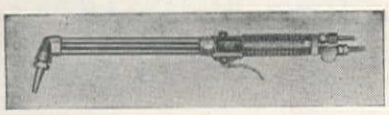
corners. Other claims are that it requires no rubbing, is non-explosive, non-inflammable, and will not injure metal or the hands of the user. CorOdex removes rust, but causes no structural changes whatever in the metal. It is available in unlimited quantities and is sold in 12-oz. and quart bottles and gallon containers.

Cutting Torch

Manufacturer: Air Reduction Sales Co., New York, N. Y.

Equipment: Airco Series 9000 cutting torch.

Features claimed: This torch with monel metal head and stainless steel tubes, which was discontinued during the war, is once again on the market. Torch head, made of durable monel metal offers long service.



The stainless steel lever and ribbed handle, the silver brazed connections to assure permanent leak-proof service, and the tubes, made of stainless steel for greater rigidity are a few features claimed. A total of 22 interchangeable cutting tips are available for the cutting torch. Standard torch is 21 in. long, and weighs 3 lb., 4 oz. It is usually supplied with 75 deg. or a 90 deg. head, but straight heads are also available.

Pneumatic Paving-Breaker

Manufacturer: Ingersoll-Rand Company, Phillipsburg, N. J.

Equipment: The PB-8, a new paving-breaker.

Features claimed: Suitable for heavy-duty demolition work and general paving breaking jobs, the machine weighs 82 lb. Efficiency is increased through use of the new kicker-port valve, while a metering device that furnishes lubrication for all working parts aids in oil economy. An adequate oil reserve is provided by a generous size oil reservoir in the handle. A rigid joint between the handle and cylinder is the result of four bolt construction, and reverse buttress threads on the fronthead bolts provide sufficient tightness without overstressing the bolts. Easier and smoother starting is provided by an improved throttle valve which allows the gradual entrance of air. Other features claimed for the new Paving Breaker are a sturdy block-type piston, long anvil-block bearing and a longer handle. The PB-8 may also be converted into a pile driver or spike driver by changing frontheads, a feature which enables the breaker to do the work of three different machines.

Diesel Engine Models

Manufacturer: Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich.

Equipment: New diesel engine models.

Features claimed: Versatility is the keynote of the new and improved General Motors Series 71 "Twin 6" Diesel engine models. Each twin unit is made up of two basic GM 6-cylinder 2-cycle engines mounted side by side and geared to a single shaft. Either right or left-hand rotation is offered. Continuous BHP at 1,800 RPM is 276 with maximum intermittent rating of 400 at 2,000 RPM. A variety of power take-off arrangements are available, and any one of four different transfer gear types may be selected. They are: (1) the H.D. or heavy duty power take-off. Takes pulley and chain drive side thrust without need for a special cradle-mounted sheave or sprocket. (2) S.S. or Stub Shaft qualifies with any type of coupling encountered with heavy duty machinery. (3) The D.F. or Drive Flange may be used where the driven machinery is to be connected directly to the power unit. (4) The O.H. or S.A.E. "O" size housing will support any close coupled power take-off within proper horsepower range. It may be applied particularly well with torque converters.

New Plumb Bob

Manufacturer: Suverkrop Instruments, Bakersfield, Calif.

Equipment: Micro plumb bob.

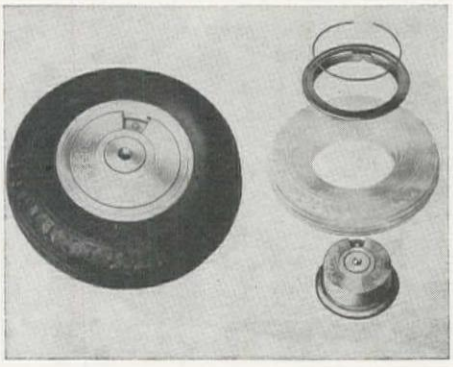
Features claimed: This precise plumb bob has a rotatable reel and special hook on top of the neck. The cord is reeled off to the approximate length wanted, then slipped into hook which holds bob exactly centered anywhere on the cord. The bob can then be minutely adjusted up and down by simply rotating the spool. Made of dense, forged brass with a point of finest steel, the Micro is properly heat treated for toughness and hardness, and fitted so as to insure against loss. Spool has a 30-ft. capacity. Comes in 10, 12, 14, and 16 oz. sizes.

New Type Pneumatic Wheel

Manufacturer: Aerol Co., Los Angeles, Calif.

Equipment: Pneumatic wheel with detachable rim.

Features claimed: Detachable rim of Aerol's new Model No. PW-1642, makes it possible to change tires in less than one minute, it is claimed. The wheel is cast of clean, corrosion-resistant aluminum alloy and comes in two sections. One includes the bearing carrying part of the wheel and one rim; the other, the detachable rim which slides into position over the main part of the wheel and is held in place by a special steel spring retainer ring. Installation is easy, as is removal of the tire. Double wall construction has been used on Aerol wheels, and they are also equipped with Timken Tapered Roller Bearings, which do not need lubrication under average conditions during their lifetime. These pneumatic tires are available in three axle sizes: 1¼-in., 1-in., and ¾-in. Hub diameter is the same for all wheels, but the ¾-in. bearings allow sufficient stock in wheel walls for mounting of a sprocket.

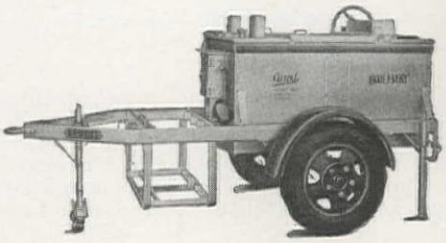


Double Vat Asphalt Kettle

Manufacturer: Aeroil Products Co., West New York, N. J.

Equipment: Thermostatically controlled kettle.

Features claimed: The Heat- Master Double Vat Kettle Model 120-DVP has been designed as the answer to the problem of correct heating and melting of the new rubberized asphalt joint sealing compounds. Differing completely from other previously known types of asphalt melting kettles, it uses a double boiler heating principle for application of thermostatically controlled indirect heating. No engines, pumps, or other similar mechanical equipment is used which requires skilled operators. Uniform heat is brought to the compound from the sides and bottom of the kettle, and also from



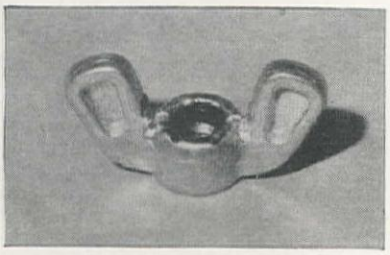
within the melting compound itself. A new type of valve has been adapted to permit use of thermostatic controls on this kettle. Once having lit the burners on the kettle, the operator need only turn a knob dial to the exact temperature required and burners go off and on as heat may be needed to keep the melted material at the exact heat necessary for operation.

Self-Locking Wing Nut

Manufacturer: Elastic Stop Nut Corp. of America.

Equipment: New self-locking wing nut.

Features claimed: Featuring a red elastic nylon locking collar, this wing nut was developed to answer design requirements calling for the convenience of a wing nut, plus the ability to lock in position anywhere on a bolt or stud. Industrial machinery and equipment, automobiles and trucks, furniture, and office equipment are but a few potential applications. Wing nuts are available in four diameters with both fine and coarse threads. Machine screw sizes, in fine threads, are 8/36, 10/32 and 12/28 with the fractional size of ¼-28. Coarse thread sizes are 8/32, 10/24 and 12/24, in addition to ¼-20.



Diamond Saw

Manufacturer: Hyatt Lapidary Equipment Co., East San Diego, Calif.

Equipment: Streamliner diamond saw for tile cutting.

Features claimed: Combining portability with low power requirements and ease of operation with accuracy of cutting, the Hyatt Streamliner has a rigid cast aluminum housing and light weight construction throughout. Weight without motor is 28½ lb. It is 11 in. wide, 21 in. long, and 6 in. deep. Efficient operation is accomplished with 1/5 hp. motor as cutting action is brought to bear at the most efficient position to cut the tile with greatest cutting force without wedging or dragging action on the tile.

LITERATURE FROM MANUFACTURERS . . .

Copies of the bulletins and catalogs mentioned in this column may be had by addressing a request to the *Western Construction News*, 503 Market Street, San Francisco 5, California.

ENGINE GENERATORS — **The Ready-Power Co.**, of Detroit, Mich., has released an 8-page booklet giving information concerning the Ready-Power Engine Generators and mentioning their use in lumber camps, mines, oil fields, manufacturing plants, construction projects, and in many other fields. Gasoline, Diesel and natural gas models are available. The booklet pictorially and editorially describes the various functions, types and the construction of parts of the engine generators. Specifications for alternating current and direct current engine generators are given.

CATALOG OF TRAILER MODELS —**Fruehauf Trailer Co.**, Los Angeles, has compiled a new 64-page catalog that contains illustrations and specifications of its complete line of trailers. Of particular interest to those in the construction field are the pages devoted to dump, machinery, tilt deck, carryall and pole trailers. Dump trailers illustrated include those with bodies designed for end, side or bottom dumping and the roll-off type which permits the hoist on the truck to operate the trailer body also. Descriptive details on the six-wheel attachment for converting conventional trucks into three-axle units are presented in the catalog.

DUMPING CONCRETE — **Maxon Construction Company, Inc.**, Dayton, Ohio, describes in its green and gold booklet the uses of the Dumpcrete for hauling concrete, sand, gravel, earth and coal. The story of its development, outstanding features, hauling and discharge advantages is given with action photographs to complement the text. A table of specifications based on the average truck chassis height "I" is printed on the back cover.

PLEXIGLAS TO GUARD—**Rohm & Haas Company**, Philadelphia, Pa., has prepared as a service to fabricators, engineers and designers a 12-page, color booklet giving the results of exhaustive research in laboratory and plant. The booklet discusses briefly the need for adequate protection for machine operators; states factually the advantages of Plexiglas; illustrates clearly the many applications of transparent plastic as safeguards; lists, for readers' information, the names of firms specializing in the commercial production of Plexiglas guards and the location of the nearest technical representative.

REDWOOD GRADE AND GUIDE—**California Redwood Association** of San Francisco, Calif., is distributing two new and helpfully illustrated data sheets, "Yard Grades" and "Grade Use Guide," to aid lumber dealers, architects and other specifiers to select the proper grade of Redwood lumber for each specific application. Designed as quick and easy references, the data sheets are the convenient 8½x11 size. They are punched for ready insertion in sales or specification books. "Yard Grades" gives a clear-cut description of each of the seven new yard grades of Redwood. It tells in simple language exactly what each grade is and indicates the suitability of the grade for specific purposes. Pertinent illustrations supplement the text. "Grade Use Guide" presents a handy list of the proper yard

grades for more than 90 specific uses of Redwood in building construction on farms and in the garden. Of special interest to architects and specifiers are two serviceable tables: "Standard Net Sizes of the Most Used Standard Patterns of Worked Redwood Lumber" and "Standard Net Sizes for Surfaced Redwood Yard Lumber."

TOOL OF MANY USES—**Templeton, Kenly & Co.,** Cicero, Ill., has recently issued a new descriptive bulletin on its Simplex Util-A-Tool. Designed to facilitate construction through speed-up on building equipment repair, together with many other industrial applications, this No. 610 set as outlined in the bulletin provides multi-purpose equipment that also pushes, pulls, spreads, clamps and lifts easily and efficiently. The center spread of the bulletin describes in detail the various construction uses of the Util-A-Tool. Listed on the bulletin's back page is a wide selection of push-and-pull jacks and steamboat ratchet pulling jacks. Specification charts and price listings on these and the Util-A-Tool are included.

SNAKE BITE KIT—**Mine Safety Appliances Company,** Pittsburgh, Pa., has released information in bulletin form of its new Plastic Snake Bite Kit, which provides rapid, dependable emergency snake bite treatment for oil field, construction and utility workers, lumbermen, research parties, section gangs, etc. The M.S.A. Plastic Snake Bite Kit is light in weight, small and compact — little larger than a pack of cigarettes—and can easily be carried in a vest pocket ready for instant use. The bulletin describes in detail and illustrates the contents and applications of the Kit.

COST CUTTING SAW RIGS — **The Paxson Company,** Dowagiac, Mich., has sent off the presses two bulletins dealing with the construction of four models of Bearcat portable power saws that are now in production. Two basic sizes are offered, each supplied in either tilting-top or fixed-top models. One bulletin pictorially and editorially describes the Bearcat Portable Models XCO (tilting-top) and CO (fixed-top) for contractors and builders doing heavy construction work. These two models rip or cut-off stock up to 9 in. thick with saw diameter up to 24 in. and require 5 to 20 HP motors. Fabricated steel table-tops are 43 in. by 54 in. on the XCO and CO. The second bulletin concerned with the use of the saws in general home building, factory maintenance, crating and cabinet-making, Models XJR (tilting-top) and JR (fixed top) rip or cut-off stock up to 4 in. thick. These models use motors or engines from 1½ to 8 HP.

ARC WELDERS OF TOMORROW —**Hobart Trade School, Inc.,** Troy, Ohio, has just published a 24-page booklet "Learn Arc Welding." Graphically pictured and described in detail in the booklet is the outline of courses, (full course takes only sixteen weeks); the location of the school; uses of arc welding in industry and in private business. This is a fully accredited school and qualified service veterans may enroll in the Hobart Trade School with the Government paying all costs of training.

HEAVY-DUTY TRUCKS—**The Four Wheel Drive Auto Co.,** Clintonville, Wis., has released a new illustrated folder describing the ten and twelve ton FWD trucks, built for heavy-duty service. Action photographs of these trucks hauling, towing heavy loads and pushing a plow in the gruelling job of snow removal, as well as cut-away views of parts simply augment the editorial content.

INSURE PROFIT—**R. G. LeTourneau Inc.,** of Peoria, Ill., has recently published a folder titled "Profit Insurance." This 12-page booklet is devoted mainly to captioned action photographs taken on typical Tournapull jobs in the general construction, industrial, railroad, mining, pit and quarry, and export fields. Actual job histories show how Tournapulls are being successfully used on roadwork, dams, airports, levees, plant site grading, coal handling, stripping and working gravel pits, and lime reclamation.

JAW AND ROLL CRUSHERS—**Universal Engineering Corporation,** Cedar Rapids, Iowa., have sent off the press two new bulletins about the Universal Series "SL" Streamline Jaw Crusher and the Series "SGRB" Star Gear Drive Roll Crusher. Tables of specifications, sectional views, cutaway drawings and photographs supplement the written information. The jaw crusher is recommended for all primary crushing in both stationary and portable quarry and gravel plant installations. The roll crusher is designed for secondary reduction following a primary crusher, and for producing large quantities of small crushed material where the secondary reduction ratio is not too great.

THE ELECTRONIC LINK BETWEEN MEASUREMENT AND CONTROL—**Wheelco Instruments Co.,** Chicago, Ill., recently issued their educational Bulletin No. 5 on "Automatic Temperature Control Systems." Charts, tables and diagrams explain measurement and automatic

OPPORTUNITY SECTION

control and the selection of proper control systems for process applications. "Thermocouples, Their Placement and Hints Governing Their Use" and "Selection of Thermocouple Protecting Tubes" are treated separately. ASME terminology referring to processes and automatic control is also listed.

CATERPILLAR DIESEL ENGINES AT WORK—**The Caterpillar Tractor Co.**, Peoria, Ill., has put out a new booklet which catalogues the many and varied work applications of Diesel engines. The booklet, which is profusely illustrated, includes mention of such applications as those industrial engines utilized in crushing plants, sawmills, mines, cotton gins, hatcheries, oil pumps and oil drilling, steel mills, pipeline pumping, feed mills, asphalt plants, ice plants, waterworks, and so on. It points to electric sets applied in lighting plants, sand and gravel plants, and other places.

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