WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

PUBLISHED MONTHLY
VOLUME XX, No. 12

DECEMBER • 1945

35 CENTS A COPY
$3.00 PER YEAR

IN THIS ISSUE

VALVES CLEAN

RINGS FREE

PORTS OPEN

With compressor oils that don't form hard carbon deposits

GET these important benefits . . . assure fewer repairs and replacements, longer and more trouble-free service between overhauls, better performance at lower cost . . . by lubricating your air compressor with *Texaco Alcaid, Algol or Ursa Oils.*

Texaco Alcaid, Algol and Ursa Oils are products born of many years of intensive research by The Texas Company in the field of air compressor lubrication. They are made from carefully selected crudes. The lubricating fractions are processed by modern Texaco methods in one of the world's largest refineries under the constant supervision of trained Texaco technicians. This is your assurance of uniformly high quality no matter where you buy them.

Texaco Products and Lubrication Engineering Service are available through more than 2300 Texaco distributing plants in the 48 States. Contact the nearest one, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

EXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

H JAMES MELTON SUNDAY NIGHTS ★ METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS

A BETTER TRUCK CRANE *for Tougher Service...*

A Northwest Truck Crane setting the foremast of the old Battleship Oregon as a monument in Portland, Oregon.

Truck Cranes always take a beating! You want yours to be ready to go at a moment's notice when you need it. You'd like to be sure you had, in it, the same dependability you find in your Crawler Cranes and Shovels—the kind of design and construction you find in a real Rock Shovel.

Northwest Crawler Cranes are serving all over the country on all kinds of work. Just as with Northwest Rock Shovels, Northwest Rubber Tired equipment is built with the hardest job a Truck Crane or Truck Shovel has to do in mind.

They bring you the same proved Northwest advantages found in Northwest Crawler Shovels and Cranes plus Truck Crane advantages, developed by Northwest engineers.

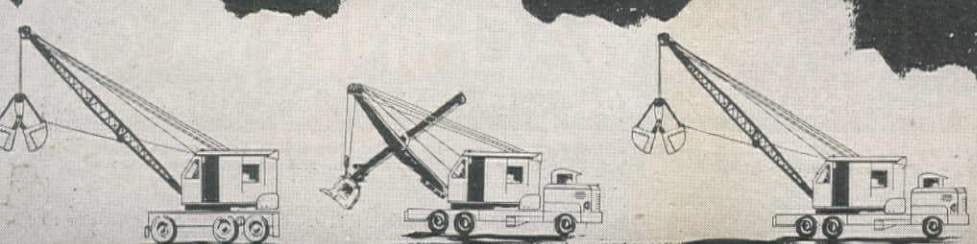
NORTHWEST ENGINEERING COMPANY
1727 Steger Bldg., 28 E. Jackson Blvd.
Chicago, Illinois

Northwest Sales Agents: **ARNOLD MACHY. CO., INC., 149 W. 2nd South St., Salt Lake City, Utah; BALZER MACHY. CO., 2136 S.E. Eighth Avenue, Portland, Oregon; WILSON EQUIPMENT SUPPLY CO., 902 W. 22nd Street, Cheyenne, Wyoming.**

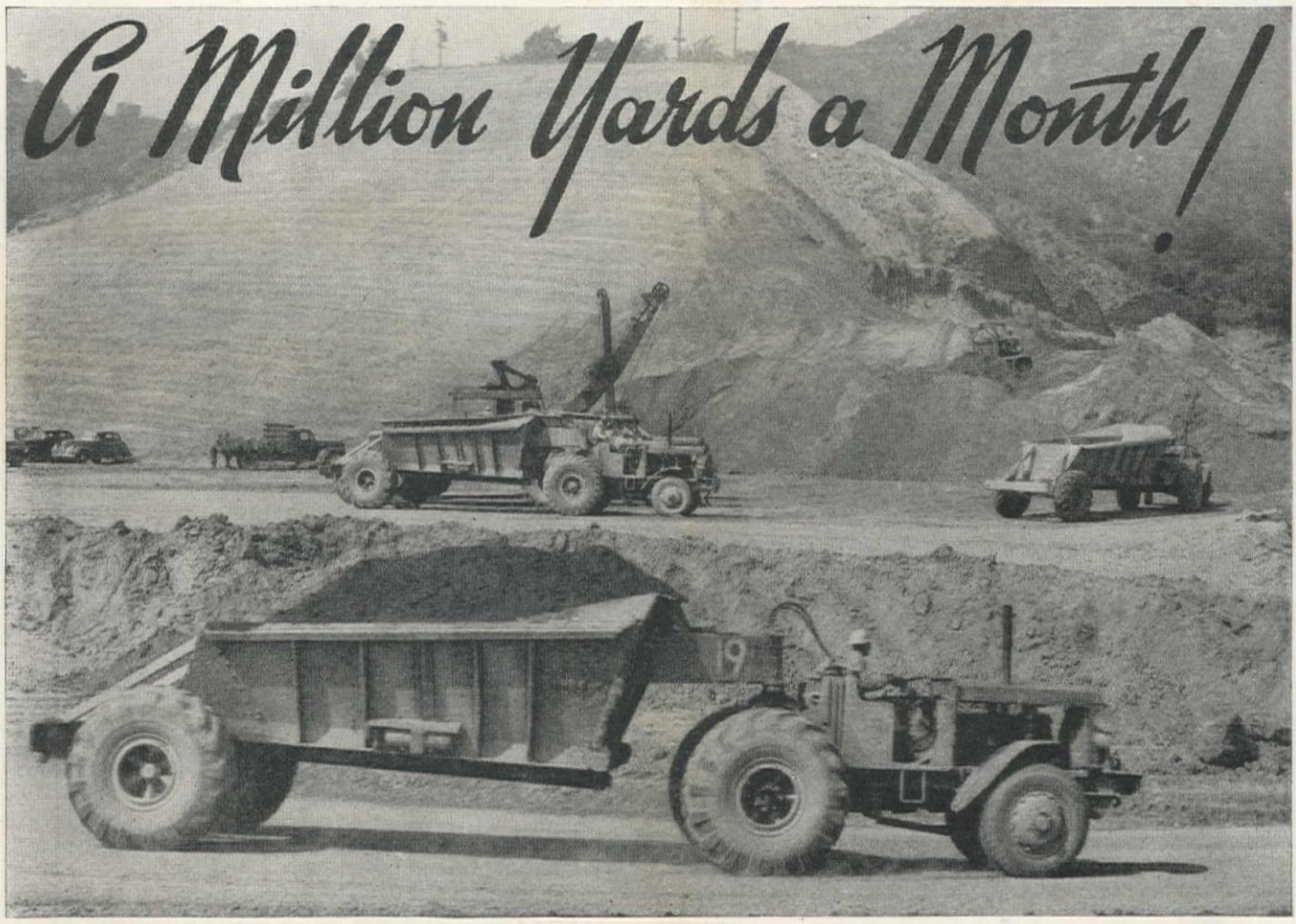
Branch Offices: **225 Tenth St., San Francisco, Calif.; 1234 Sixth Ave., South, Seattle, Wash.; 3707 Santa Fe Avenue, Los Angeles, Calif.; 3015 Claremont, Denver, Colorado**

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



Wait until you have seen the new NORTHWEST Rubber Tired Line of Truck Cranes, Truck Shovels or Wagon Cranes Before You Buy!



EUCLIDS Proved Their Mettle on This California Project

● The construction of Santa Fe Dam — a tremendous earth fill flood control project on the San Gabriel River near Azusa, California — required the hauling of 14,000,000 cu. yds. of material. Four large western contractors* combined their forces and equipment on this job.

Approximately 6,000,000 cu. yds. were hauled in 22 Euclids on hauls varying from 1500 ft. to 4.5 miles. They moved about 1,500,000 yards of core material over the longest haul, and the balance — consisting of sand, gravel and boulders — was hauled an average of 4,000 feet.

During peak operations a million yards were moved in a single month. Euclid speed, capacity and dependability of performance helped to make this record possible.

Euclids are built for tough, off-the-highway service — to move earth economically. See your distributor for facts and figures on what Euclids will do for you — or write us direct.

*Morrison-Knudsen Co., Winston Bros. Co., J. F. Shea Co., and Ford J. Twaits Co.

Outstanding Euclid Features

Exclusive Euclid all-enclosed double-reduction full-floating planetary type drive axle . . . unequaled for years of trouble-free performance on the toughest jobs.

Euclid wedge-shaped hopper which distributes more of the payload weight to drive wheels for better traction . . . rigidly welded, riveted and bolted construction.

Internal expanding air brakes, 17¼"x5½" brake shoes . . . individual steering brakes on drive wheels for better steering and traction control. Sturdy three-way universal hitch permits maximum maneuverability. Euclid wheel wind . . . simple air controlled mechanical device for closing doors, tested by years of trouble-free service. Doors opened instantly by control valve on steering column . . . closed in a few seconds on the return trip.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

THE EUCLID ROAD MACHINERY CO.

3710 SAN PABLO AVENUE — PIEDMONT 8046 — EMERYVILLE, CALIFORNIA

Brown, Fraser & Co., Ltd., Vancouver; Columbia Equipment Co., Portland; A. H. Cox & Co., Seattle; Hall-Perry Machinery Co., Butte; Intermountain Equipment Co., Boise; The Lang Co., Salt Lake City; Lively Equipment Co., Albuquerque; Constructors Equipment Co., Denver. District Representative: J. K. Greer, 2350 Jasmine, Denver, Colorado.

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Covering the Western Half of the National Construction Field

Contents for December, 1945

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Editor

Published Monthly by King Publications

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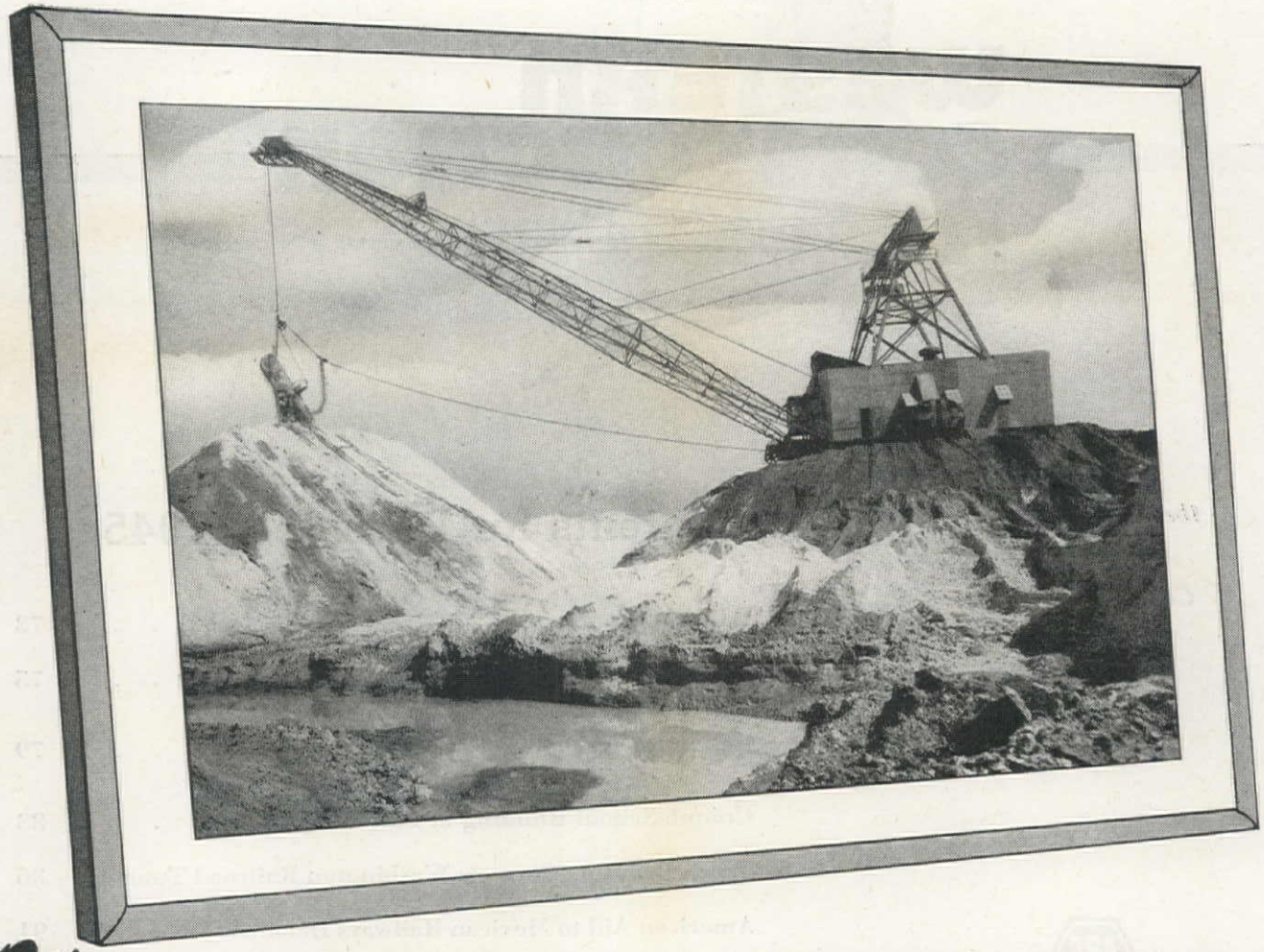
Please address correspondence to the executive offices, 503 Market St., San Francisco 5, California

Entered as Second Class Matter at the Post Office at San Francisco, California, under the Act of March 3, 1879.

SUBSCRIPTION RATES

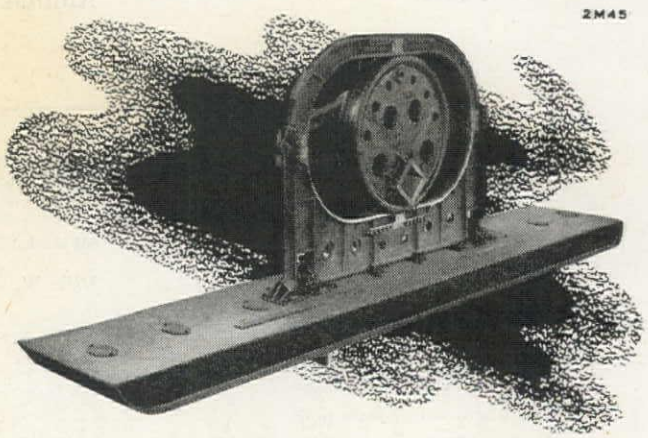
The annual subscription rate is $3 in the United States and foreign countries where extra postage is not required. To Canada and to foreign countries where extra postage is necessary the annual rate is $4. Single copies, 35 cents.



Winning Phosphate Output in a Walk!

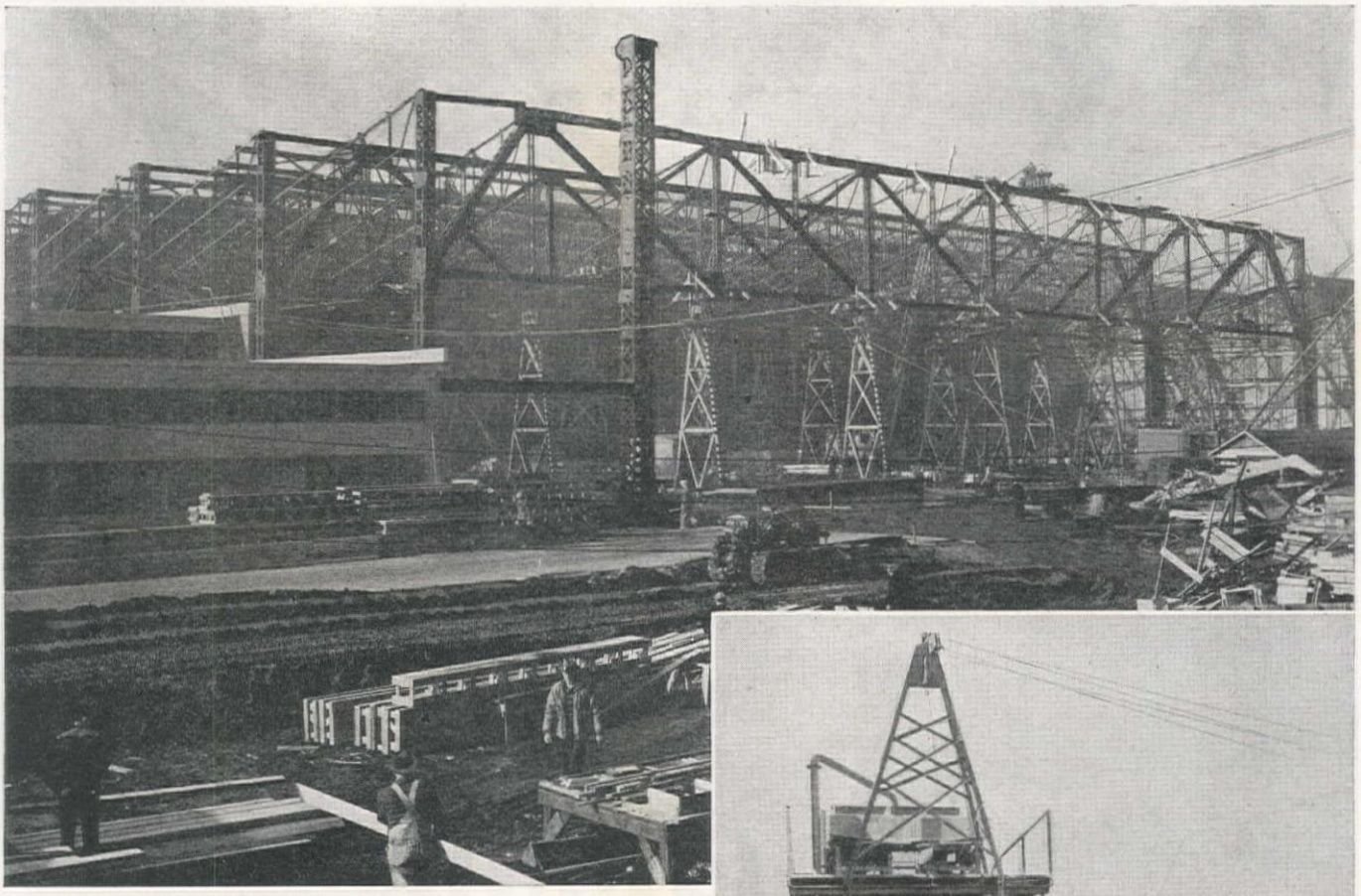
High water table means a soft, fully-sloughing surface which is one of the big problems in open pit phosphate mining in Florida. For profitable output under these conditions, many leading companies have selected Bucyrus-Monighan and Bucyrus-Erie walking draglines. These "years ahead" machines operate on big-area bases ideal for soft-ground performance. They have smooth rolling-cam walking traction which permits easy moving over soft or rough ground, and side-stepping in any direction to avoid trouble. Long booms fit stripping and matrix-handling; strong, simple construction keeps maintenance costs low. Easy, responsive controls permit the operator to make full use of the speed and balance built into digging, hoisting, swinging, and dumping motions. Available with booms to 250 feet and buckets to 50 yards, these walking draglines have proved their leadership in difficult work all over the world.

2M45

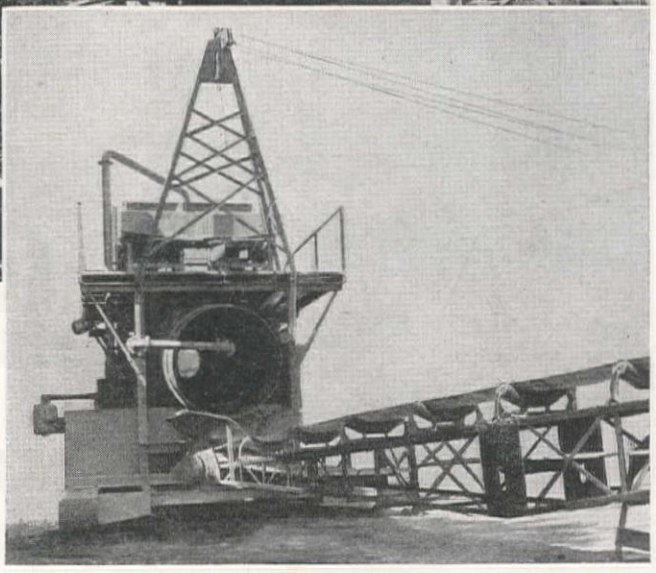


BUCYRUS-ERIE

South Milwaukee, Wisconsin



200-FOOT TRUSSES FOR BOEING—
ERECTION BY THE AUSTIN COMPANY



PORTABLE GOLD DREDGE BUILT FOR
MILL AND MINE SUPPLY COMPANY

Structural Steel— Now and Later

The structural steel you need will be produced to your complete satisfaction and delivered on time if you utilize the services of Pacific Car and Foundry Company's trained engineers and designers, skilled workmen and extensive plant facilities.

CARCO is proud of its long record of cooperation in working with architects, engineers and contractors.

CARCO'S staff is thoroughly experienced in all types of steel construction, from small welded units to complete steel assemblies for factories, bridges, buildings, towers, tanks, dredges, and other structural steel products. The two completely equipped, modern plants have every facility for shearing, rolling, forming and welding.

From light gauge material to heavy plate, your job will be completely detailed, fabricated, and, if desired, erected to your specifications.

May we quote on your requirements?

PACIFIC CAR AND FOUNDRY COMPANY

CARCO

SEATTLE AND RENTON, WASHINGTON, U. S. A.

FRUEHAUF

A GOOD NAME TO HAVE ON YOUR TRAILER

WHEN THE NAMEPLATE on your Trailer reads "Fruehauf" you are sure of several things.

You know that the Trailer you purchased was designed especially for your job—that there was no attempt to give you size or model "almost correct."

You know that it was built with a full realization that you are concerned with uninterrupted performance—with a Trailer's ability to stay on the job!

And, you know that back of it is not only a nation-wide service organization, but a company which has grown big by adhering to the sound principle "The Customer Is Boss."

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY

Western Manufacturing Plant — Los Angeles

Sales and Service Branches:

Los Angeles	Fresno	Portland
San Diego	Phoenix	Spokane
San Francisco	Seattle	Denver
Salt Lake City	Billings	El Paso

FRUEHAUF TRAILERS FRUEHAUF TRAILERS *"Engineered Transportation"*

REG. U. S. PAT. OFF.

STILL YOUNG

At-45,000 hours

45,000 WORKING HOURS is the record of this old "Caterpillar" Diesel Forty Tractor. Owners: Baragar Bros., Contractors, Elm Creek, Manitoba. Used with bulldozer, scraper, blade and elevating graders—on road building and airport contracts, winter freighting, and general farm work. Owner says, "Does twice as much work—and at half the operating cost—as the tractor it replaced."

At-19,200 hours

19,200 WORKING HOURS is the record of this husky "Caterpillar" Diesel No. 11 Motor Grader. Owner: Pratt County, Kansas (R. A. Peterson, County Engineer). Used for grading, snow-plowing and general road maintenance. Mr. Peterson says, "Operates at 60% of fuel cost and does twice as much work as the equipment it replaced."

22,000 WORKING HOURS is the record of a Diesel Seventy-Five Tractor this progressive county owns.

As the hour-meters on "Caterpillar" Diesel Engines, Tractors and Motor Graders roll up work records of 20, 40 and even 50 thousand hours, the evidence of sound planning, correct engineering and quality manufacturing grows more and more impressive.

What were once considered unusual life spans in power equipment are rated today as "normal expectancies" in "Caterpillar" Diesels. It is when "outside" comparisons are made that their outstanding endurance and performances are fully appreciated.

Typical examples of the long, serviceable life of "Caterpillar" Diesels are pictured here. At the time their hour records were reported, the units were still "going strong" and, according to their operators, far from the end of their career.

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

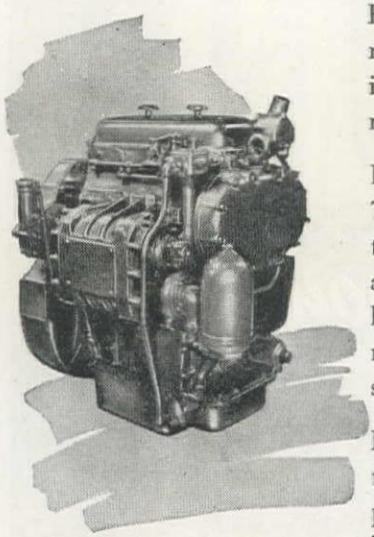
CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES · TRACTORS · MOTOR GRADERS · EARTHMOVING EQUIPMENT

The discharged veteran wears this emblem. Remember his service and honor him.

Hard working hand that keeps on the job



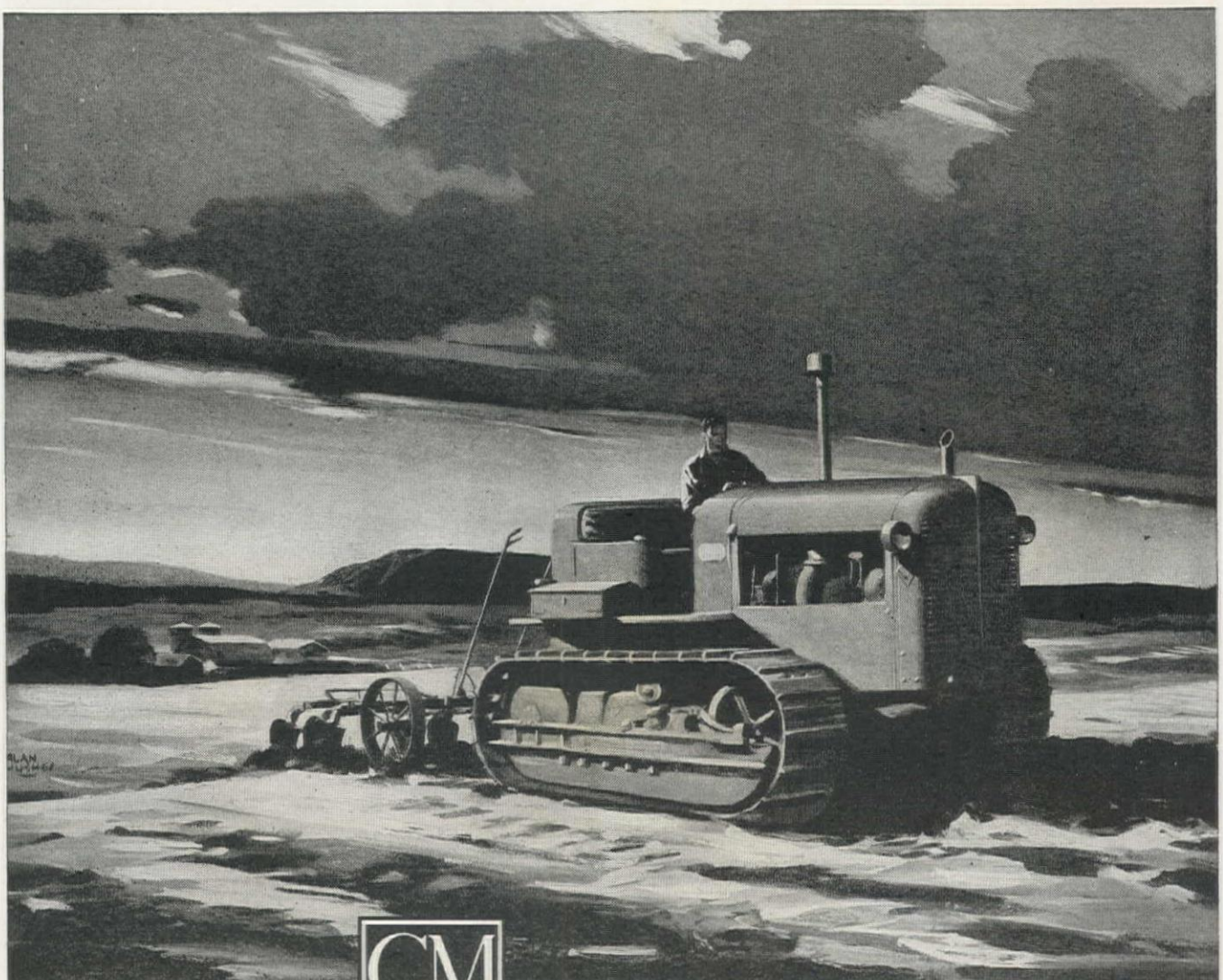
How hard a tractor can work, and how long, rests largely with its engine. Drawbar pull is heavy. Strains are great. And the job must go on day in and day out.

It's right here that General Motors Series 71 Diesels shine. Both in peace and at war they have built rare records of performance. Already many of them in tractors have delivered up to 25,000 hours of economical performance and are still going strong.

Farmers and construction engineers like them especially because they deliver great power with less than usual size and weight. They start fast and are easy to service. And replacements when needed are readily available because of GM simplified design and because elimination of *different* sizes of parallel parts increases the availability to owners of the right part *when it is needed.*

The successful example of GM Diesel power in tractors indicates its value in other products such as lumber carriers, "special" trucks —in all forms of marine power requirements —in all forms of contractors' and road machinery—in welders—in mining and pumping—in any tough industrial job.

During five years on the Arena-Norton farm, largest vegetable shippers in Arizona, an Allis-Chalmers tractor like this, powered by a GM Diesel, has operated 18,186 hours, day in and day out. This 3,200-acre farm now employs four of these tractors.



KEEP AMERICA STRONG
BUY VICTORY BONDS

GM
GENERAL MOTORS
DIESEL POWER

SINGLE ENGINES . . Up to 200 H.P.
MULTIPLE UNITS . . Up to 800 H.P.

DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.

Light but tough—

For The RIGHT COMBINATION

TYPES

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

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

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

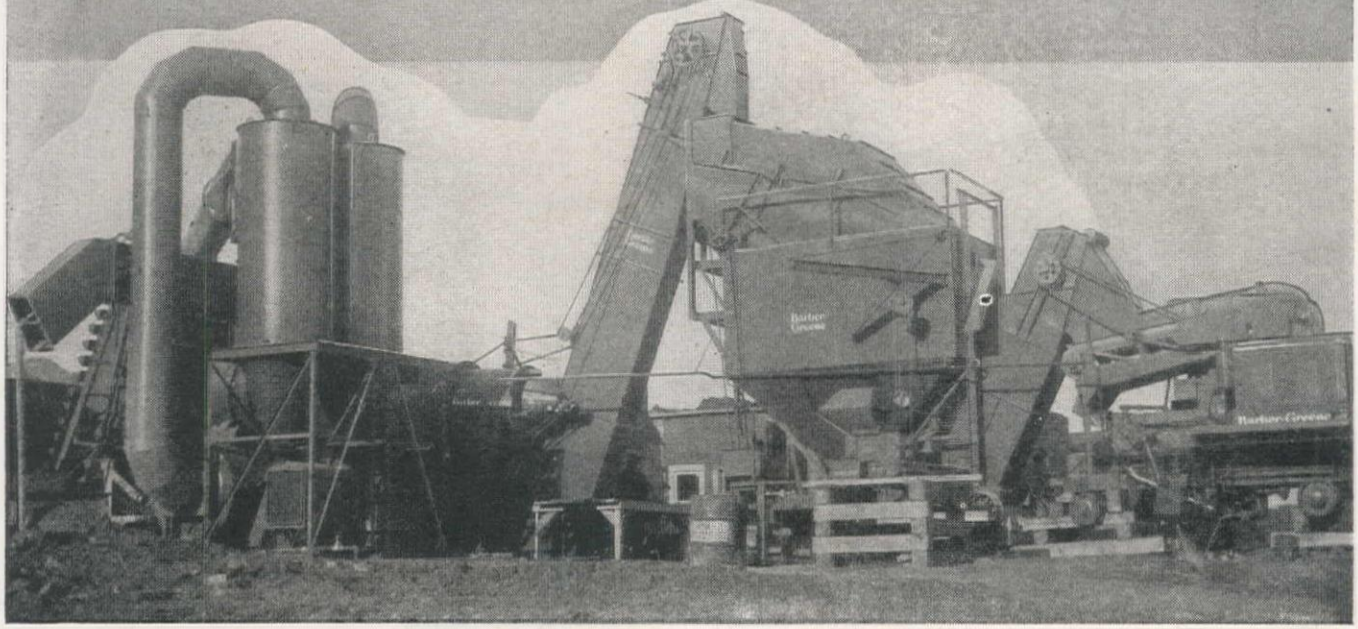
3/8 to 30 Cubic Yards

Also available without perforations.

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

DESOTO FOUNDRY, INC. • MANSFIELD, LOUISIANA

WHY THE COST PER TON IS LOWER WITH A B-G CENTRAL ASPHALT PLANT



The high daily output of this Barber-Greene Central Plant brings down the cost per ton of bituminous mix.

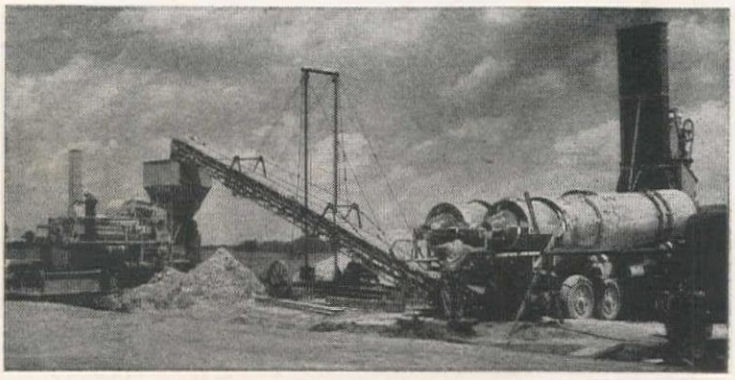
Continuous, straight-in-line, automatic measuring and mixing keeps production at the peak, hour after hour.

You'll find that the capacity of a B-G Central Plant is higher—size for size, weight for weight, investment for investment—than any other outfit you can buy. What's more, you can hook up any combination of these individual, carefully engineered, portable B-G units that best meets your construction conditions and specifications.

Complete portability means further savings—in transportation time and expense. You can locate at the most economical point . . . reduce truck mileage . . . increase your margin of profit on the smaller jobs. Several sizes available according to your requirements. Barber-Greene Company, Aurora, Illinois.

Above: A complete B-G Central Plant for production of highest type mixes, with Reciprocating Feeder, Cold Elevator, Dual Drum Dryer, Dual Cyclone Dust Collector, Hot Elevator, Gradation Control Unit, and Mixer.

Right: Here's one of the combinations for turning out "intermediate" type mixes. Gradation Control Unit is omitted. This set-up bridges the gap between high-type mixes and the "low cost" type of road mix construction.



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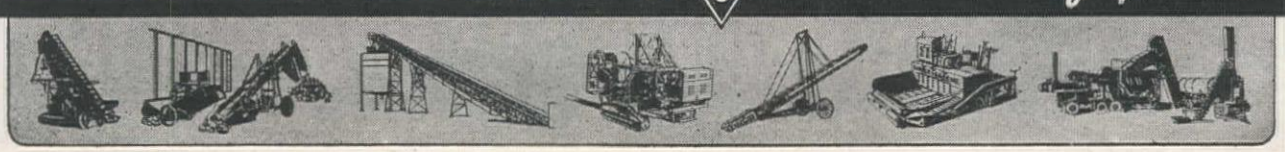
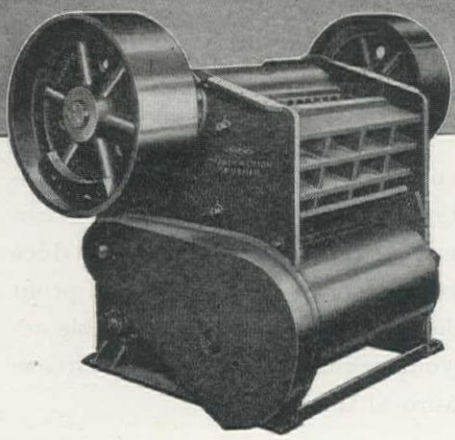
Barber-Greene B G *Constant Flow Equipment*



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

DIAMOND

DUAL-ACTION, portable CRUSHING AND SCREENING PLANT



3 SIZES—
70-200 CUBIC YARDS PER HOUR

Here's the Plant the Trade's Talking About!

SHORTER—by several feet than conventional plants. The DUAL-ACTION crusher saves space by combining primary (jaw) and finishing (roll) crushers into one smaller, lighter, more efficient unit.

LIGHTER—the DUAL-ACTION Crusher weighs about half the total weight of ordinary jaw and roll crushers. Shorter frame means less weight. Result: Plant is lighter by *one-third or more* than other portable plants. Comes well within all highway load limits.

MORE EFFICIENT — This modern DIAMOND plant with new DUAL-ACTION crushing principle produces more material faster, with less power — increases profits. No other plant can give you "DUAL-ACTION."

Ask for BULLETIN 45-M

OTHER DIAMOND UNITS

Jaw Crushers—Roll Crushers—Hammermills — Conveyors — Vibrating Screens — Scalping Screens—Scrubber Screens—Drag Washers — Feeders — Bins - Hoppers — Grizzlies.

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Phoenix	O. S. STAPLEY CO.
Albuquerque	CONTRACTORS' EQUIP. & SUP. CO.

DIAMOND

DIAMOND IRON WORKS, INC.

AND THE MAHR MANUFACTURING CO. DIVISION

1818 SECOND STREET NORTH MINNEAPOLIS 11, MINNESOTA

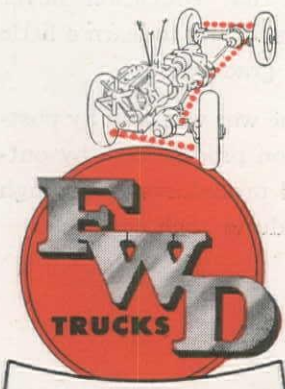
FWD *Snow-Bank Busting* POWER CONQUERS HEAVIEST DRIFTS

● FWDs are the snow-clearing trucks that can bust in and break the worst snow banks — clean them up fast, economically! Sure-footed traction and power on all four wheels make FWDs the No. 1 snow removal and road maintainance trucks of the nation. Thousands of these rugged, heavy-duty trucks, equipped with many different types of snow plows, will deliver the knockout punch to snow in every state in the snowbelt this year, and remove the menace of snowbound highways, streets, airports and other areas where snow must be put out of the way.

When Spring comes, these same rugged snow-fighting trucks will have their plows removed, to change over to the many other tough road jobs which only four-wheel-drive power and traction can match. One truck for ALL jobs, ALL seasons . . . that's the FWD!

THE FOUR WHEEL DRIVE AUTO COMPANY, Clintonville, Wis.

Canadian Factory: KITCHENER, ONTARIO



THE ORIGINAL EXCLUSIVE BUILDERS OF FOUR-WHEEL-DRIVE TRUCKS

THE ONE TRUCK FOR MANY JOBS

SPRING — Road conditioning and construction.
SUMMER — Earth-moving. Material hauling.
FALL — Road patrolling. Snow fence hauling.
WINTER — Snow clearing.

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.

then he said to himself:

"Education Will Win"

OF all the heroic plans to raise the status of the people—simplest and most practical is that of Mexico's President Camacho. Says he—

> "Each educated Mexican is to teach an illiterate Mexican to read and write."

The reason for this, he explains, is that we are going into a new world where education will win. Well he knows that the passing along of primary facts, from the instructed to the uninstructed, provides the toehold for education in any line.

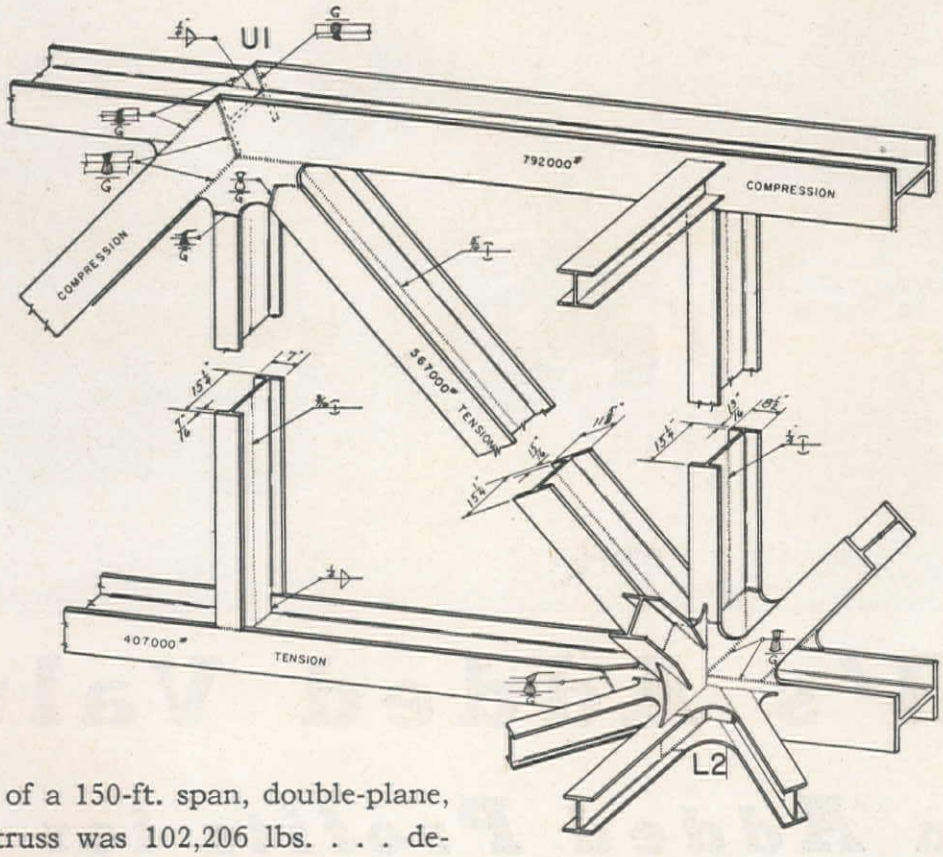
Well he knows that education never hurts a man, if he is willing to learn a little something after he graduates.

Well he knows the war was won by post-graduate thinking on production—by outsmarting outmoded procedures — through thousands of procedures such as—

"TEACH"... *he says*

HERE, PRESIDENT CAMACHO, is a source of education for any man interested in producing better structures at lower cost with Arc Welding:

HOW TO SAVE 21,806 LBS. IN TRUSS WEIGHT



Net weight of a 150-ft. span, double-plane, riveted jack truss was 102,206 lbs. . . . designed for an equivalent uniform load of 6,000 lbs. per linear foot. Designed for the same conditions and strength of arc welded construction, the truss weighs only 80,400 lbs. . . . saving 21.2% in truss weight.

The design and fabrication of this jack truss, *part of which* is shown above, are discussed in detail in Structural Studies 100 and 101. Free on request. Ask for these and future Studies on your business letterhead.

THE LINCOLN ELECTRIC COMPANY • DEPT. W-1 • CLEVELAND 1, OHIO

America's greatest natural **recourse**

ARC WELDING

HARNISCHFEGER CORPORATION: 82 Beale Street, San Francisco, Calif.
Warehouses Service Stations: Seattle, Los Angeles, San Francisco.
Portland, Oregon: Loggers & Contractors Machinery Co., 240 S E. Clay St.; Willows, Calif.: Willows Motor Sales Co.; Napa, Calif.: Berglund Tractor & Equipment Co., 1224 Third Street; Salt Lake City, Utah: National Equipment Co., 101 West Second Street, So.; Boise, Idaho: Olson Manufacturing Company, 2223 Fairview Avenue; Spokane, Washington: F. M. Viles & Co., 1007 Second Avenue, West; Sacramento, Calif.: Capital Tractor & Equip. Co., 235 W.16th Street; Reno, Nevada: Dennison Tractor & Supply Company, 559 East Fourth Street; El Centro, Calif.: Faure Tractor and Equipment Company, 1414 Main Street.

P&H EXCAVATORS

P&H's Added Values

mean *Added Profits* for you!

When you own a P&H, you're in a stronger competitive position to get business—to earn more profit. For P&H builds to quality standards far beyond those of the industry. P&H's added values make your investment a better investment for years to come.

HYDRAULIC CONTROL—smoother, faster, easier operation than you've known in an excavator.

PLANETARY TRANSMISSION—faster, more accurate crowd controls—far lower maintenance costs.

BETTER STEERING—you can turn right or left abruptly or make a complete circle without stopping.

TRACTOR TYPE CRAWLERS—save hundreds of dollars each year in trouble-free travel.

ALL WELDED CONSTRUCTION—rolled alloy steels provide greater strength, greater rigidity—longer life throughout.

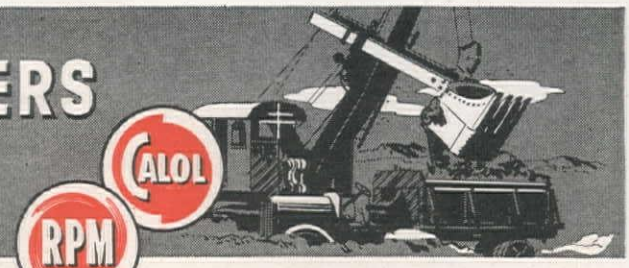
These are but a few of P&H's added values. Ask about the rest.

YOUR DOLLARS BUY MORE WHEN YOU BUY P&H

P&H EXCAVATORS
4490 W. National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION
EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

STANDARD ENGINEERS NOTEBOOK



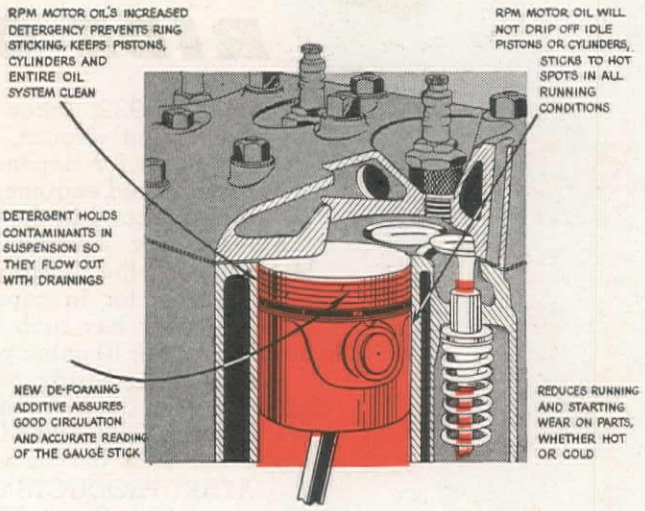
Improved RPM Motor Oil compounding reduces overhauls

Because of the lessening of military requirements for special ingredients used in heavy-duty lubricating oils, more compounding is now used in the manufacture of RPM Compounded Motor Oil. Operators using RPM Motor Oil will find engines running much cleaner and a marked reduction in wear on parts.

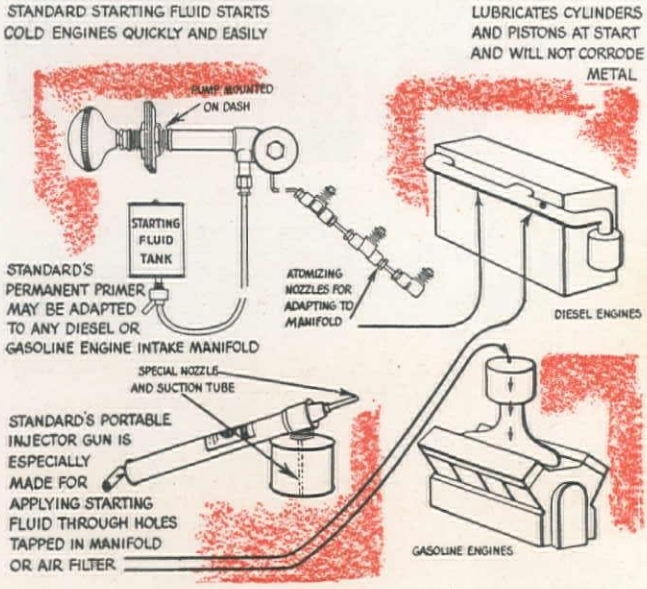
More detergent in RPM Motor Oil assures loosening of any gum-carbon deposits around rings, thus preventing sluggish action of rings, sticking and blow-by. Its washing action keeps cylinders, pistons and oil systems cleaner. It keeps contaminants dispersed in the oil until drained.

A new de-foaming compound has been added to RPM Motor Oil assuring full-flow oil circulation.

One hundred percent paraffin base RPM Compounded Motor Oil is improved in all of its old qualities including special affinity for metal whether hot or cold, resistance to oxidation and sludging, and prevention of corrosion on all engine parts.



Quick starts with cold engines in below-zero weather



In low temperatures, Standard Starting Fluid will save operators much time and trouble. It not only helps start engines almost at once when injected into fuel-mixing systems, but will keep them running until warm enough to operate on their regular fuel. It has started cold Diesels in temperatures as low as –50°F. and gasoline engines in temperatures as low as –40°F.

Standard Starting Fluid may be applied by a permanent primer pump mounted convenient to the operator and attached to atomizers installed in the engine manifold, or a portable spray gun used to inject the fluid through a hole in the manifold of a Diesel engine or the air filter of a gasoline engine. Both are available from Standard of California.

Standard Starting Fluid is easy to use. With the engine turning over, pump the primer or spray gun until the engine starts. Then diminish the spray volume until the engine is warmed up.

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

FOR EVERY JOB A STANDARD OF CALIFORNIA TEST-PROVED PRODUCT

...a peek into the future—

two brand new asphalt plants

for the bigger jobs —

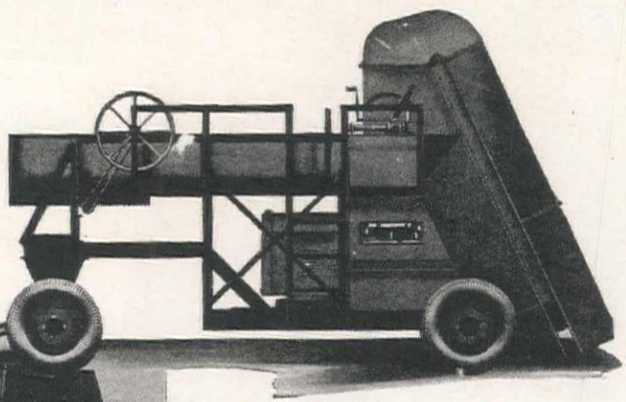
THE MODEL "F" (batch type)

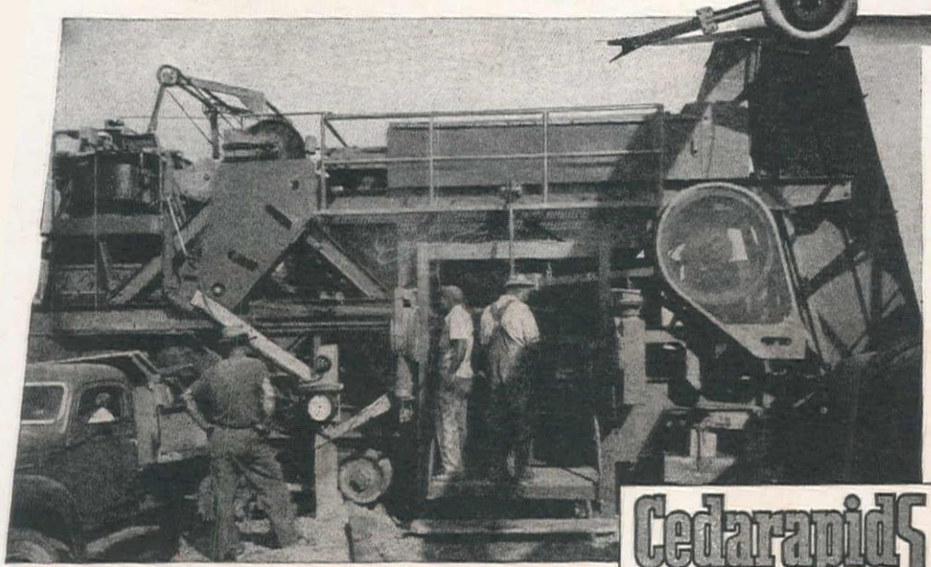
Here's the most portable, 2,000 lb. batch type plant you ever saw. It grades the aggregate, weighs the material, mixes it to suit specifications, does it better and satisfies the most rigid inspection. You can set it up ready for operation *faster* than any other plant we have ever built. Folding elevator is the only part that has to be raised. Patented skip elevates the aggregate from batcher near ground level to Pug Mill thus eliminating all tower structure. Mix is discharged directly into trucks without using belt conveyors. The Model F is the plant you have been waiting for to give you portability, low cost and troubleproof operation. Uses our standard sizes of dryers. Handles 2,500 pounds easily.

for the smaller jobs —

THE PATCHMASTER (continuous-mix type)

Its name describes it perfectly — the ideal machine for making patch material for anybody's paved roads or streets — anywhere. The Patchmaster is a continuous-mix type plant that will turn out a remarkably accurate mix at the rate of 25 to 30 tons per hour. Available with or without running gear, or drier, this new plant can be used as a portable or stationary plant to meet practically any plant mix problem. Gasoline or diesel engine or electric motor for power. Low priced — Low maintenance cost — Better mixes.





THE IOWA LINE
of Material Handling Equipment
is Distributed by

HOWARD-COOPER CORP.
Seattle, Washington, and Portland, Eugene, and Medford, Oregon
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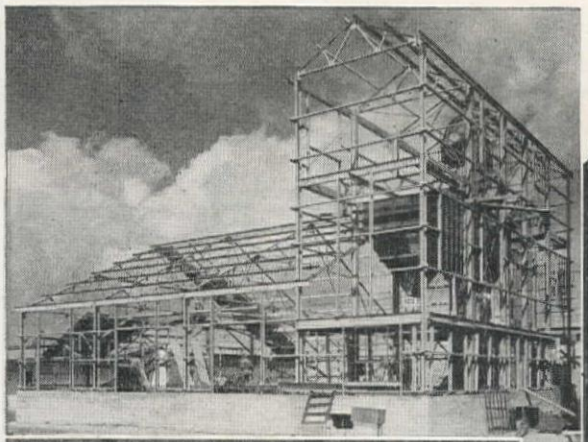
Cedarapids

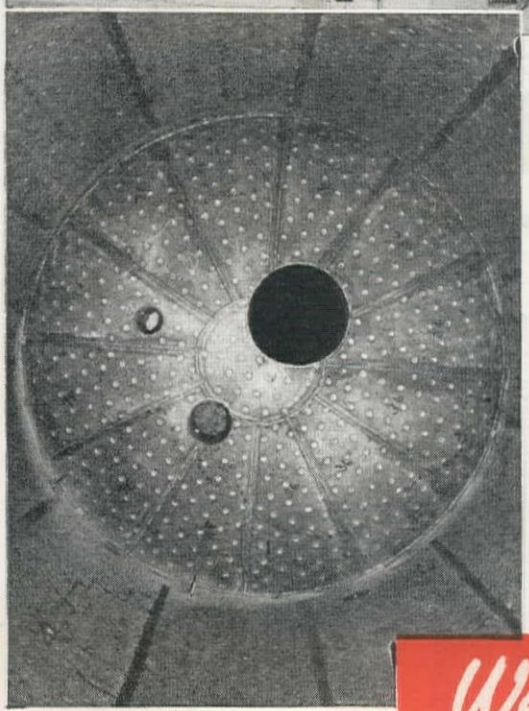
Built by IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa

STEEL CONSTRUCTION MEN *who know how!*





Developments by steel construction men today are numerous and varied. Tomorrow's demands call for precision and exactness. Pipe will be bent into intricate shapes, while sheets will be stamped or formed, punched and welded to special contours.

Western Pipe & Steel Company's personnel over the past forty years has accumulated millions of hours of steel construction knowledge and 'know-how. Whether it be of a storage tank, smoke stack, pressure vessel, water, oil or gas pipe line, Western Pipe & Steel Company has the answer to your steel construction problems.

Our staff will be glad to make recommendations on the application of steel to your needs. A letter or call is all that is necessary.

WESTERN BUILT PRODUCTS INCLUDE:

- Tanks
  - Bolted
  - Galvanized
  - Riveted
  - Welded
- Towers
- Gas Cleaners
- Gas Holders
- Gas Separators
- Heat Exchangers
- Linings, Corrosion Resisting
- Pipe
  - Gas, Water & Oil
- Towers
  - Bubble
  - Evaporator
  - Fractionating
- Vessels
  - Pressure
  - Walkways
  - Structural

Western PIPE & STEEL COMPANY OF CALIFORNIA

Fabricators and Erectors

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Low Cost Dirt-Moving with
INTERNATIONAL TRACTORS

The cost factors of power go down to bedrock when International Diesel Tractors do the dirt moving. *Low fuel consumption for work done* is the first benefit. *Greatly reduced maintenance* assures savings of time and money. *Long-lived stamina* reduces depreciation write-offs. And their *adaptability to all kinds of work* keeps International Crawlers forever busy.

There's a size of International TracTracTor or Wheel Tractor for almost every kind of power need—well adapted to any application you may have in mind.

Ask the International Industrial Power Distributor near you for information and help in selecting the best power and equipment for the projects you're planning.

INTERNATIONAL INDUSTRIAL POWER DISTRIBUTORS

Stanley J. Commerford, Eureka, California
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Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue — Chicago 1, Illinois

We'll see you at the
A. R. B. A. Convention
Chicago, January 14-17.

INTERNATIONAL INTERNATIONAL HARVESTER **Industrial Power**

HIGHBALL

California Channel Change *with* 6 TOURNAPULLS

Lytle Creek Channel change between San Bernardino and Colton, California, must be completed before next spring's floods. The channel is being dug 27′ deep, 40′ wide at bottom and will be concrete lined. All available equipment is being used.

To contractor Clyde Wood, quick completion on his section meant Tournapulls, so he moved in a fleet of 6.

Heap full loads in dead sand

Working in loose sand the pusher-loaded Tournapulls get heaped 12-yard pay loads in 150′. Loading takes 1½ to 2 minutes because the loose sand tends to bulldoze ahead of the blade. To minimize this condition, water wagons wet down the cut and hauling ramps to help pack the sand . . . enable the Tournapulls to load faster and climb the steep grades without slippage.

Average 8000′ cycle every 11 minutes

Each Tournapull completes the 8000′ round trip in 10½ to 11 minutes in spite of tough loading and stiff grades! That figures around 56 pay yards per Tournapull per 50-minute hour. When your jobs are tough and rush . . . pick Tournapulls to pull you through at a profit . . . they are job-proved for lowest net cost per yard. To find out what Tournapulls can do for you, see your LeTourneau Distributor TODAY.

C42

E TOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

JOB-PROVED
Over 3800 Built and Shipped

TOURNAPULLS*

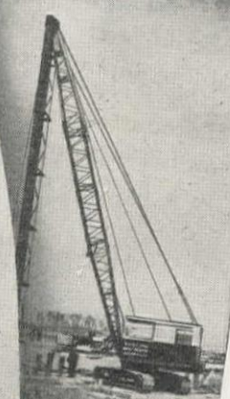
*Trade Mark Reg. U.S. Pat.

Purchase Order # ——

Successful Contractors, Inc.
Everywhere

Quantity | Description | Price

The MARION of MY CHOICE



NOW AVAILABLE

A fast—powerful—modern machine—in a size and type to meet all job requirements.

Make your choice a Marion.

THESE
MARION
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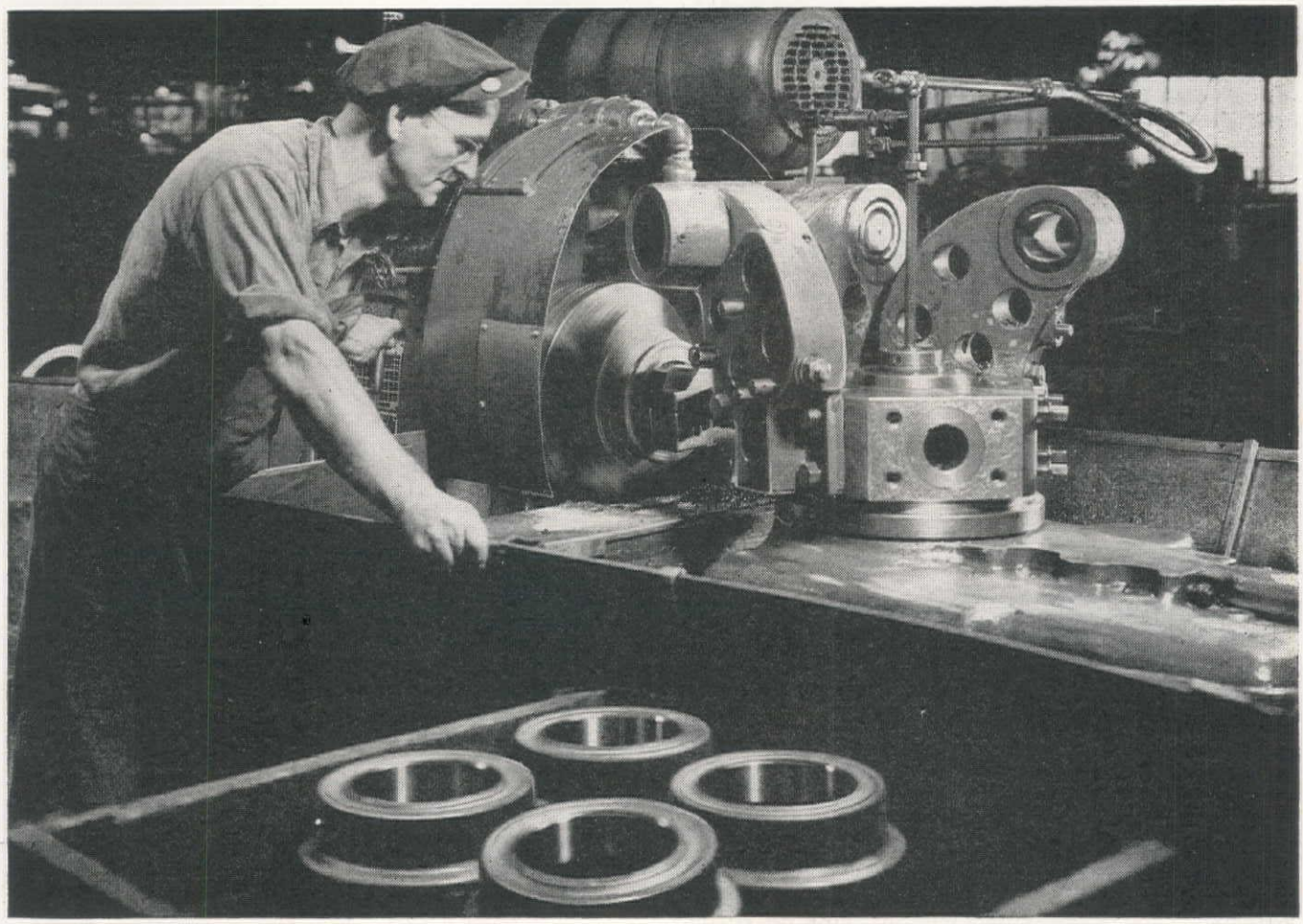
KNOW MATERIAL HANDLING

Edward R. Bacon Company, Folsom at 17th Street, San Francisco 10, Calif.; The Marion Steam Shovel Company, 571 Howard Street, San Francisco 5, Calif.; Joseph O. Reed, The Marion Steam Shovel Company, 603 Terminal Sales Building, Portland 5, Ore.; Star Machinery Co., 1741 First Avenue., South, Seattle 4, Wash.; Shaw Sales & Service Co., 5100 Anaheim Telegraph Road, Los Angeles, Calif.; H. H. Nielson, 902 Boston Building, Salt Lake City, Utah.

They are at your Service

THE MARION STEAM SHOVEL COMPANY
MARION, OHIO
Offices and Warehouses in all Principal Cities
3/4 cu. yd. to 40 cu. yds.



Boring lower track wheels to .002 tolerance using Carbide tools in the Oliver "Cletrac" plant.

We hold an "edge"!

The use of Carbide cutting tools in boring our lower track wheels . . . tools that will hold their cutting edge at higher operating speeds . . . is one reason why Oliver "Cletrac" tractors hold a big "edge" in quality.

Typical of the modern production methods in the Oliver "Cletrac" plant, this cost-cutting boring operation permits us to build in added quality, in materials and workmanship, without added cost to you. Highly skilled Oliver "Cletrac" craftsmen plus the most modern equipment combine to maintain the standard of *extra* quality that is characteristic of every Oliver "Cletrac" tractor.

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

CLETRAC

THE OLIVER CORPORATION Cletrac

a product of

The OLIVER Corporation

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

STOODY HARD-FACING ALLOYS

Lengthen the Service Life of Vital Equipment

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

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

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

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

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

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

Save Buying Time

Send for your FREE copy of this illustrated folder — "Welding Supplies Price List". It gives full details on Airco's comprehensive line of gas welding supplies. Address your nearest Airco office or write to Dept. WCN at the New York office.

AIR REDUCTION

Western Offices: San Francisco, Calif.; Emeryville, Calif.; Portland, Ore.; Los Angeles, Calif.; and Seattle, Wash.

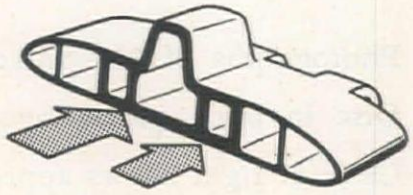
Offices in All Principal Cities

AIRCO

Everything for gas welding and cutting

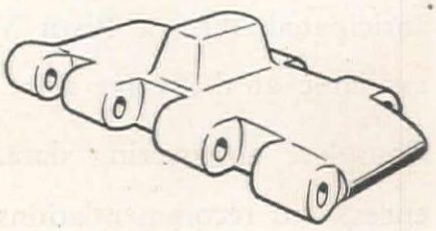
Ninety thousand pounds shovel weight plus 30,000 pounds digging load — and any one of the 66 hardened cast alloy shoes can take the whole 120,000 pounds. So strong, they'll outlast unhardened high carbon steel shoes at least three to one.

Double Thick WHERE THEY TAKE THE LOAD



Cross section shows double thick crawler roller paths, rigidly supported by double thick inside ribs. Cast, seamless, this shoe takes loads as a unit. Heat-treated alloy has basic strength, ductility to ride out shock loads, hardness to resist abrasion.

Self-Cleaning, OF COURSE! NO DIRT TRAPS



Like the shoes on Koehring equipment for 25 years, the hardened cast alloy shoes on the Koehring 605 have no dirt traps. Smoothly streamlined, they shed mud and stones and won't shower grit on the crawler belt rollers.

PACIFIC HOIST & DERRICK CO. . . . Seattle, Washington
WESTERN MACHINERY CO. . . . . Spokane, Wash.
COLUMBIA EQUIPMENT CO. . . . . Portland, Oregon
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WESTERN CONSTRUCTION EQUIPMENT CO. . Billings, Mont.
KOEHRING COMPANY WEST COAST PARTS WAREHOUSE . Sacramento, California

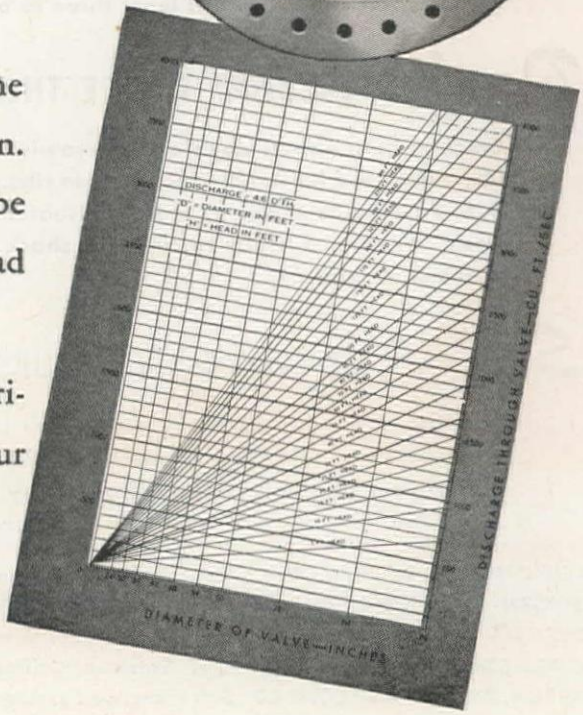
INVESTIGATE

Chapman's

DOW DISC-ARM PIVOT VALVE

For control, regulating, throttling, emergency shut-off and free discharge service

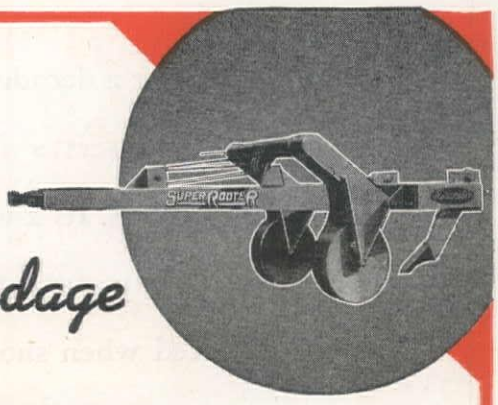
Photographs of 30" valve show position of the Disc in open, partly open and closed position. Chart at right shows approximate discharge to be anticipated thru a Pivot Valve under the head available at the valve inlet.



Complete engineering data, applications, experiences, and recommendations are contained in our Bulletin No. 40. Write today for your copy.

The CHAPMAN VALVE
Manufacturing Company
INDIAN ORCHARD, MASSACHUSETTS

Boost Dozer and Scraper Yardage

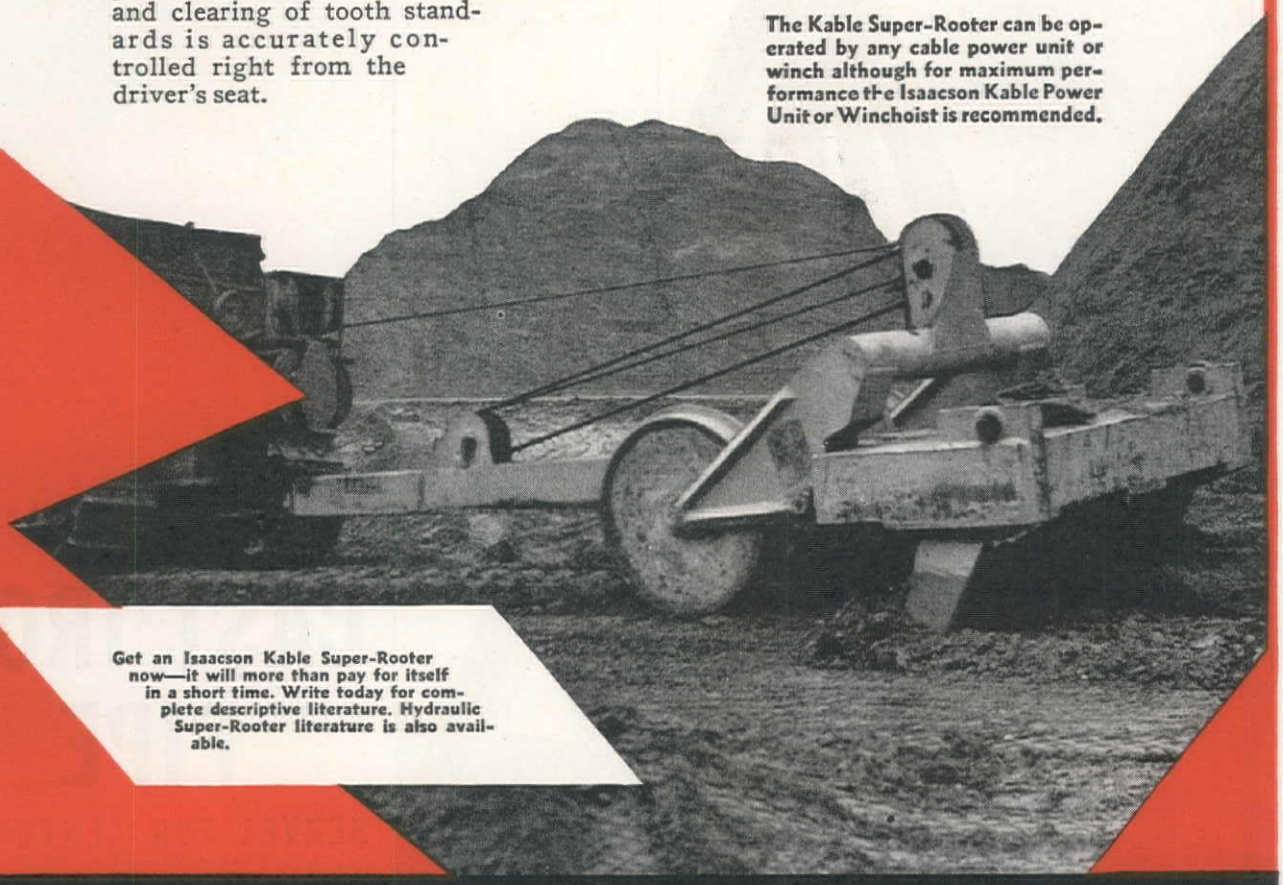


Turn an Isaacson KABLE SUPER-ROOTER

loose on hardpan, decomposed granite, sandstone, macadam or other rock-like materials and your digging costs will "hit the skids." You'll see your Kable TracDozer or Karry-Scraper *yardage* shoot right up when you break ground with one of these husky rippers. You'll save wear and tear on your other dirt-moving equipment, *get bigger loads in half the time.* What's more you'll be able to tackle the toughest jobs that come your way, frequently *without blasting.*

Built to take hardest knocks and shocks, the box beam all-welded construction of the heavy duty Super-Rooter will handle the drawbar pull of largest tractors. When more weight is needed just fill the frame with water, sand or punchings. The digging depth and clearing of tooth standards is accurately controlled right from the driver's seat.

The Kable Super-Rooter can be operated by any cable power unit or winch although for maximum performance the Isaacson Kable Power Unit or Winchoist is recommended.



Get an Isaacson Kable Super-Rooter now—it will more than pay for itself in a short time. Write today for complete descriptive literature. Hydraulic Super-Rooter literature is also available.

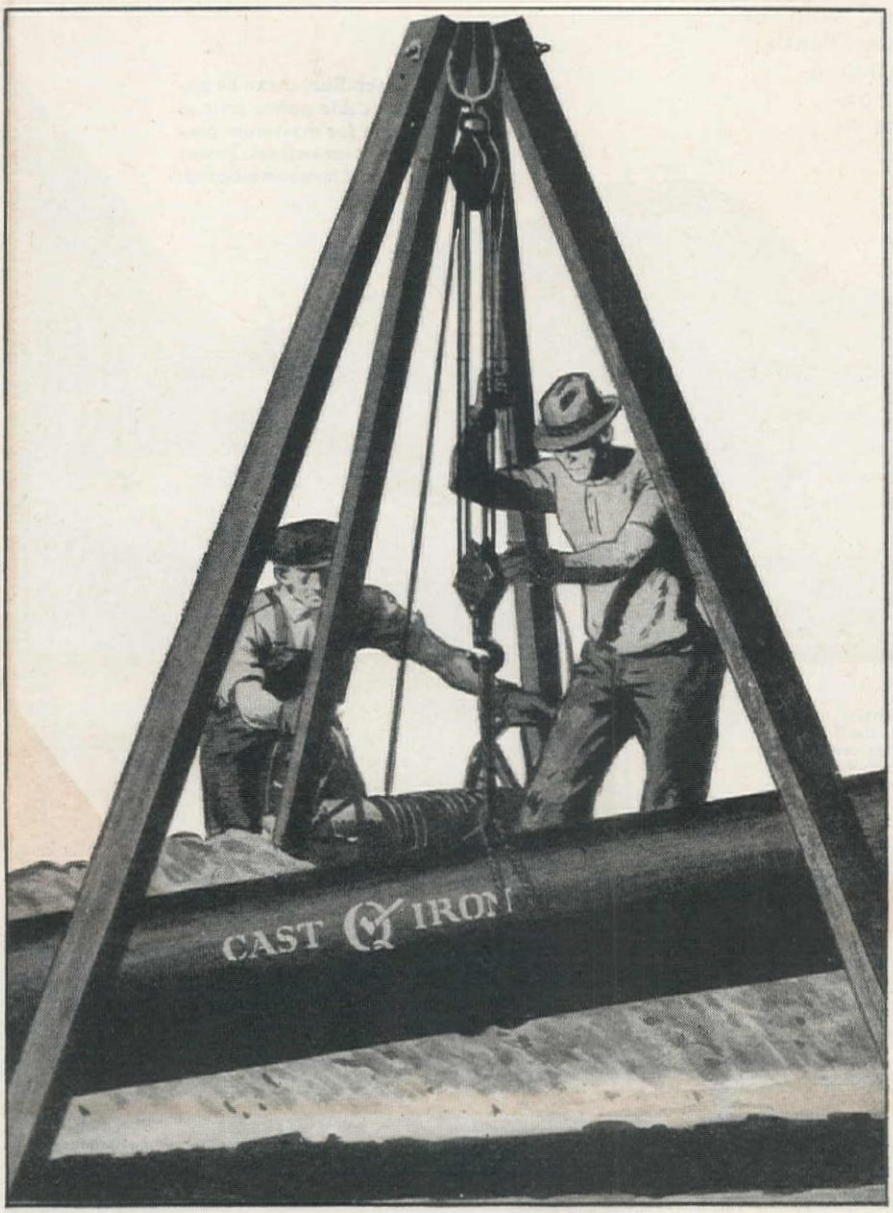
ISAACSON

Tractor Equipment

A PRODUCT OF THE ISAACSON IRON WORKS • SEATTLE

Not for a decade, not for a generation, but for a *century* or more, cast iron pipe serves faithfully and economically in water, gas and sewerage systems. Its known useful life is more than double the estimated life of other pipe used for underground mains. Replacements sooner or later required when shorter-lived pipe is installed are avoided by the use of cast iron pipe, thus saving many millions of tax dollars. That is why cast iron pipe is so often referred to as Public Tax Saver No. 1.

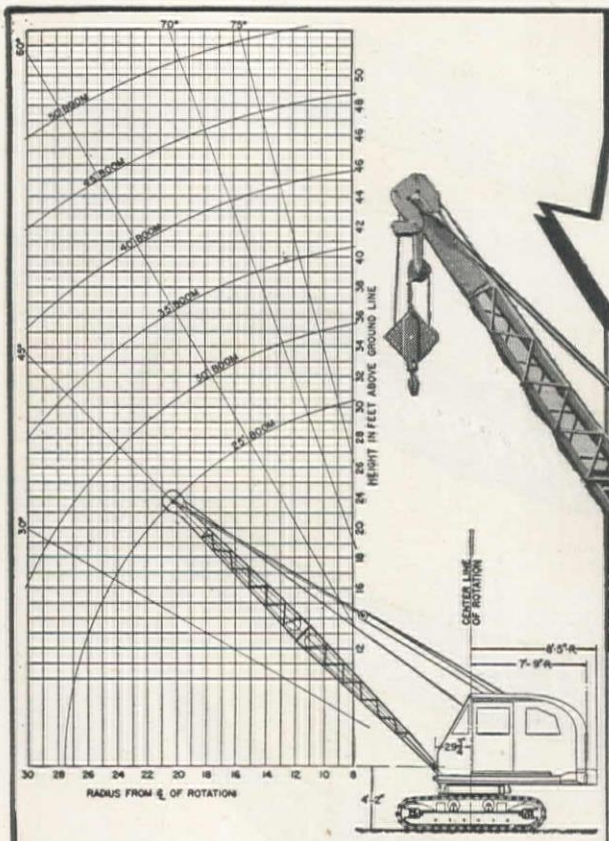
Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, Peoples Gas Building, Chicago 3, Illinois.



CAST IRON

CAST IRON PIPE

SERVES FOR CENTURIES



MODEL C-16
CRANE CAPACITY CHART

Boom Length	Radius In Feet	Standard C'Weigth	1000 lb. Extra C'Weigth	2000 lb. Extra C'Weigth	1400 lb. Rear C'Weigth	Rear C'wt. +1000 lb. C'Weigth	Rear C'wt. +2000 lb. C'Weigth
25 ft. Boom	10	12,550	14,000	15,500	14,700	16,200	18,000
	12	9,580	10,750	11,900	11,290	14,740	13,500
	14	7,780	8,680	9,600	9,120	10,020	11,400
	16	6,530	7,280	8,000	7,660	8,420	9,200
	18	5,620	6,270	6,900	6,610	7,260	7,900
	20	4,950	5,550	6,100	5,810	6,380	6,900
	22	4,420	4,920	5,400	5,180	5,690	6,200
	25	3,780	4,230	4,700	4,460	4,900	5,300

AN EASIER HANDLING EASIER OPERATING CRAWLER- SPEEDS EVERY JOB!

Model TLDT-20 Truck-type Crane, 12-ton capacity

Model T-6-K Truck-type 3/8-yard Shovel, 6 to 8 ton Crane. Completely convertible.

MODEL C-16 MICHIGAN
½-YARD CRAWLER-CRANE

Faster production, greater operating ease, lower costs on all types of crane work—that's what owners and operators get with this combination of job-proven MICHIGAN-built crawler unit plus the air-controlled mechanism of the world-famous Michigan Truck-Type Shovel-Crane . . .

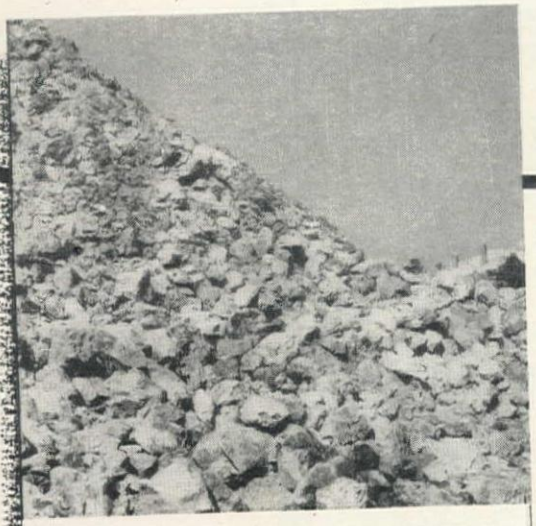
The complete story about Model C-16's *tractor steering, simultaneous travel-hoist-swing-crowd, quick convertibility, finger-tip air-controlled clutches* — and many other time-saving, profit-earning MICHIGAN features — is given in Bulletin W-125. Write today.

MICHIGAN
POWER SHOVEL COMPANY
BENTON HARBOR, MICHIGAN

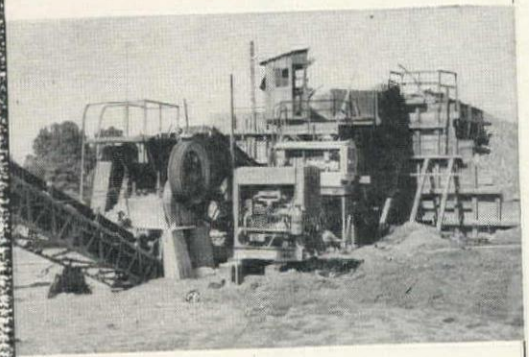
CRUSHING FLINTROCK

ONE OF THE HARDEST AND MOST ABRASIVE ROCKS IN THE WORLD

with PIONEER EQUIPMENT



Flintrock boulders, near Joplin, Mo. equalled in abrasiveness by only one known South African rock deposit.



Pioneer Plant owned by Harold Youngman of Baxter Springs, Kansas.

Pioneer No. 56 Primary Crusher Unit—Travelling Grizzly Feeder and 2436 Primary Jaw Crusher.

● This is one of those interesting jobs that men who make their living in pit and quarry enjoy reading. It begins with the Santa Fe railroad which has recently installed new high-speed trains on its main line west of Kansas City. It was found that limestone ballast did not stand up under severe service.

Chats, which are rejects from lead and zinc mines near Joplin, Mo., were available, but their size was minus $\frac{3}{8}$" and too fine for ballasting the main line for high-speed trains.

Also available were great piles of flintrock which the mine operators had rejected as uncrushable. The mining section of W.P.B. advised that this rock was the most abrasive known in the U. S. and equalled only by one known rock deposit in the world located in South Africa.

Harold Youngman of Baxter Springs, Kansas, took the contract to crush this flintrock to $1\frac{1}{2}$" minus. The following PIONEER equipment is doing the job:

- a PIONEER No. 56 Primary Crusher, which consists of a Grizzly feeder and a 2436 Primary Jaw Crusher
- a PIONEER 1536 intermediate jaw crusher
- a PIONEER 48-V plant which includes a 1036 jaw crusher, a 40" x 22" roll crusher and a 4' x 12' vibrator screen.

Because of the extreme abrasiveness of the rock, it was found that better results could be obtained by using the four crushers and closing down the top opening on the jaw crushers, thus reducing the angle between the jaws and increasing the manganese life several times.

PUT IT UP TO PIONEER

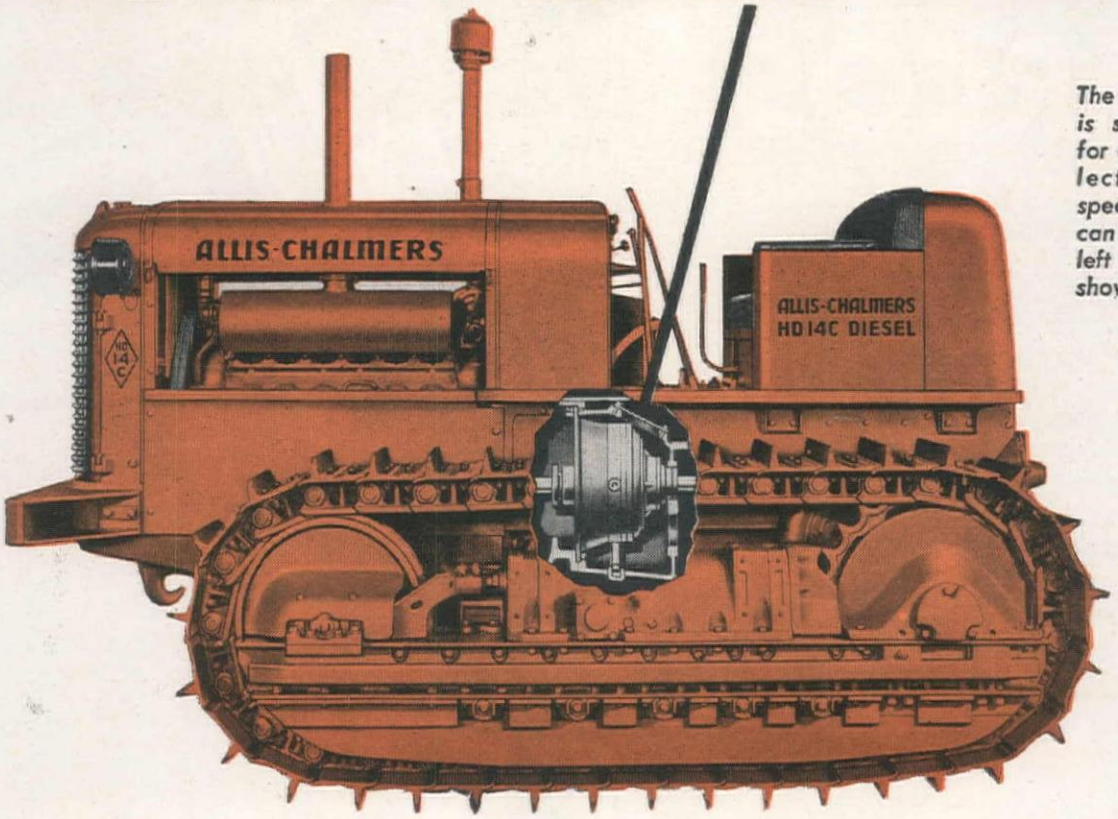
You may never have a job like Mr. Youngman's, but whatever your job you'll want Pioneer equipment—the dependable equipment built with extra margins of performance for extra profits.

Pioneer
ENGINEERING WORKS
Jaw Crushers · Roll Crushers · Screens · Conveyors · Feeders · Washers

ENGINEERS and MANUFACTURERS of QUARRY-GRAVEL AND MINING MACHINERY

MINNEAPOLIS 13, MINN

NOW... A TORQUE CONVERTER TRACTOR



The torque converter is simply a device for automatically selecting maximum speed at which load can be moved. At left is cutaway view showing location in tractor.

ALLIS-CHALMERS MEETS THE NEED

Here it is . . . the tractor of the times . . . torque converter driven . . . tried, tested, proved over the last five years on every type of construction work . . . now in full production! It's revolutionary — different from any tractor you've ever seen . . . amazing, the way it smooths out and steps up tractor performance.

25% MORE WORK is accomplished because horsepower output of engine is held near maximum — the torque converter balances tractor speed with load to give maximum operating speed at all times. This means many more yards moved, more miles of roads built.

LESS GEAR SHIFTING, less operator fatigue, because the torque converter instantly, automatically does, in effect, what the operator of a conventional tractor accomplishes when he shifts gears — makes available the necessary pull or push to handle the load. The engine cannot be overloaded or stalled — keeps running even when an extreme overload pulls tractor to a standstill.

SMOOTHER OPERATION — longer tractor life and longer life of auxiliary equipment is assured by smoother operation. There is gradual acceleration and even application of power — of particular advantage in lengthening the life of cable.

CUSHIONED PROTECTION — cushion of oil eliminates solid contact between engine and power train, protecting all parts of tractor and auxiliary equipment against shock and abuse.

MORE ACCURATE CONTROL — operator can inch into any desired position smoothly, gradually, safely.

SIMPLIFIED DRIVE — the torque converter is a simple mechanism, only two moving parts separated by a cushion of oil. In addition, transmission is simplified — three forward speed ranges cover every need, with operation in any gear from zero to maximum — up to 2.89, 3.61, 7.13 m.p.h. . . . to 3.36 m.p.h. reverse.

You will want to investigate these and the many other advantages of this revolutionary, money-making Diesel tractor. Get all the facts from your Allis-Chalmers dealer.

FREE

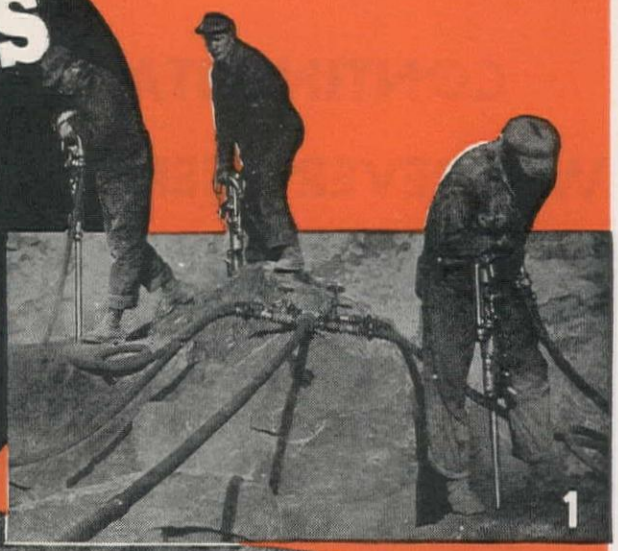
Write for this book:

"Allis-Chalmers HD-14-C Torque Converter Tractor"

Fully explains torque converter principle and its application to the HD-14-C.

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

JACKHAMERS *for* EVERY JOB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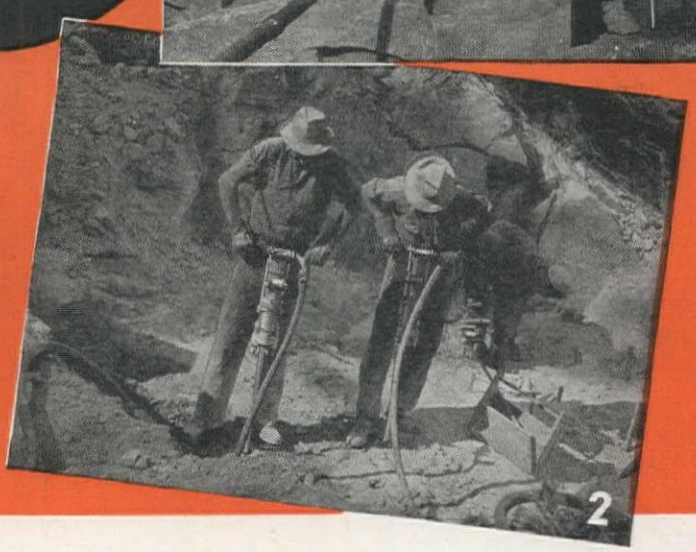
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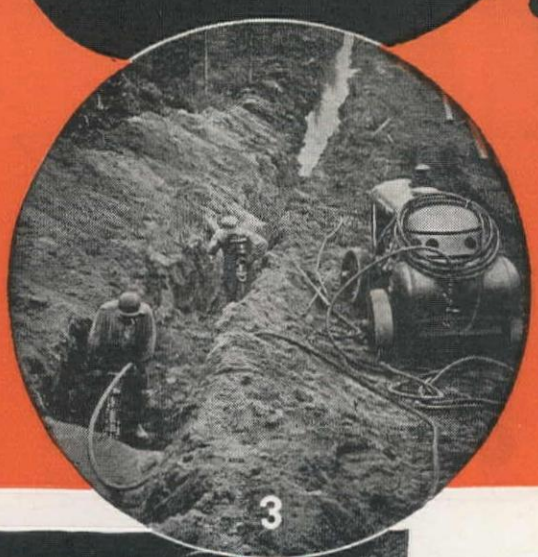
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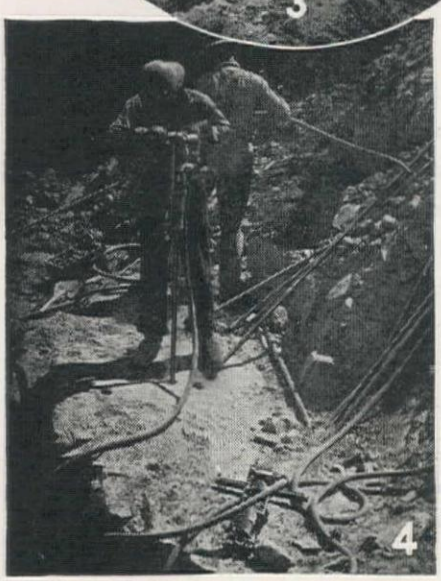

4

All six sizes* of Ingersoll-Rand Jackhamers are outstanding performers. There's a machine for every job. Fast drilling, ease of handling and ability to stand up under hard use have made them general favorites with drill operators and owners everywhere.

The fine performance of these machines is backed by Ingersoll-Rand's experienced service organization. This group of men will not only give advice on how you can get the most out of your rock drills, but they can also help you select the best machine for your conditions.

• • • • •

1. Three JB-5 Jackhamers at work. The easy holding of this machine enables operators to drill more feet of hole per shift.
2. Roadbuilding requires sturdy, dependable equipment. Jackhamers are famous for trouble-free operation.
3. Jackhamers, Mobil-Air Compressors and Jackbits speed construction of eastern pipeline.
4. JB-4 Jackhamers aid construction of important western dam.

*A JACKHAMER FOR EVERY JOB

Model	Weight Class
JB-30	30 lb.
JA-35	35 lb.
JB-4	45 lb.
JB-5(S-68)	55 lb.
X-59	80 lb.

Jackbits reduce the cost of drilling rock.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

5-576C

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • OIL AND GAS ENGINES

10 BIG REASONS WHY...

OWNERS PREFER ADAMS MOTOR GRADERS

★ There are many reasons why Adams Motor Graders are the outstanding choice of owners who demand the utmost in performance, utility, endurance and economy. Here are ten of the foremost:

1. **STRENGTH AND DURABILITY**—Adams have the rugged strength and stamina to stand up under continuous hard work—with minimum maintenance and repair.
2. **BALANCED DESIGN**—Weight is distributed to exert adequate blade and scarifier pressures, utilizing full power and traction of Adams machines.
3. **POWER AND TRACTION**—All models powered by dependable International engines, with lugging ability to hang on in tough going. Suitable traction utilizes full engine power.
4. **ADAPTABILITY TO WIDE RANGE OF JOBS**—All models, from smallest to largest, are adaptable to every type of surface, ditch and bank work of which motor graders are capable.
5. **WIDE RANGE OF SPEEDS**—All models have wide range of working speeds, plus high top speeds for fast transport from job to job.
6. **EASY STARTING**—Push-button starting available—engine starts easily, in any weather.
7. **DEPENDABLE OPERATING CONTROLS**—Adams positive mechanical controls always operate at uniform speed, regardless of number used at any one time.
8. **ECONOMICAL OPERATION**—International engines are easy on fuel and oil—economical to keep up. All working parts of graders are adjustable for wear, insuring long life.
9. **BIG FRONT AXLE CLEARANCE**—Adams high-arch front axle provides exceptional clearance—no power wasted bulldozing axle through heavy windrows.
10. **WORLD WIDE DEALER SERVICE**—Adams machines are sold and serviced throughout the United States and Canada, and in 30 countries all over the world.

The proof of Adams superiority is in the performance facts. Ask your near-by Adams dealer for the full, convincing story.

J. D. ADAMS MANUFACTURING CO.
Indianapolis, Indiana

LOCAL *Adams* DEALERS

ALASKA—Glenn Carrington & Co., Fairbanks
ARIZONA—O. S. Stapley Company, Phoenix
CALIFORNIA—Lee & Thatro Equip. Co., Los Angeles
Sutton-Morf Tractor Co., Sacramento
J. G. Bastain, Redding
Valley Equip. Co., San Jose, San Francisco
Brown Tractor Co., Fresno
Thompson-Sage, Inc., Stockton
CALIFORNIA (Cont.)—Farmers Mercantile Co., Salinas
Stevenson Farm Equip. Co., Santa Rosa
Stanislaus Impl. & Hdwe. Co., Modesto
Exeter Mercantile Co., Visalia
Gallagher Tractor & Impl. Co., Merced
COLORADO—McKelvy Machinery Co., Denver
IDAHO—Intermountain Equipment Co., Boise, Pocatello
MONTANA—Industrial Equip. Co., Billings, Missoula
NEVADA—Brown Motors, Reno
NEW MEXICO—Hardin & Coggins, Albuquerque
OREGON—Howard-Cooper Corp., Portland, Eugene
UTAH—The Lang Company, Salt Lake City
WASHINGTON—Howard-Cooper Corp., Seattle
Intermountain Equipment Co., Spokane
WYOMING—Industrial Equip. Co., Billings, Mont.
The Lang Company, Salt Lake City, Utah

The economics of cathodic protection demand a stable pipeline coating

When considering the installation of Cathodic Protection for pipelines, it is important to select a pipe protection whose underground electrical insulating properties are not affected by varying moisture content of the soil during changes in season, weather or by time itself. Obviously, the correct amount of electrical current cannot be varied continually to compensate for the fluctuations in current required.

Barrett *Coal-tar* Enamels possess this all-important *stability* of high dielectric strength. Because of their resistance to moisture absorption, they provide a constant, uniform and long-lasting stable insulation.

Coal-tar Enamels, applied by the modern mechanical methods now in use, and electrically inspected, assure the proper continuity of a stable insulation—and require less current and smaller capacity equipment to make Cathodic Protection economical.

The effectiveness of Barrett Coal-tar Enamels in preventing corrosion in conjunction with Cathodic Protection has been established through years of service in all types of soil and climatic conditions. A dependable guide to engineers when designing corrosion-proof pipelines.

FIELD SERVICE: The Barrett Pipeline Service Department and staff of Field Service men are equipped to provide both technical and on-the-job assistance in the use of Barrett Enamel.

Barrett COAL-TAR ENAMEL

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

THEY'RE HERE!

NEW LPC CARRIMORS*

...IN 8 AND 14 YARD SIZES!

COMPLETELY NEW FROM THE GROUND UP AND THOROUGHLY PROVED BY 2 YEARS OF TESTING

Everyone who has seen these new LaPlant-Choate scrapers in action has been quick to admit that "they have all the good points of other rigs—*and a lot more besides.*" Moreover, on scores of tough earthmoving jobs from coast to coast, these greatly improved cable outfits are proving far superior to competitive equipment in all phases of operation. But don't take our word for it. Ask your nearest LaPlant-Choate "Caterpillar" distributor to take you to see the new LPC's working. Then you'll learn why so many agree on LPC for *lowest possible cost per yard*—wherever tractor-drawn scrapers are indicated. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; San Leandro, California.

*Reg. U.S. Pat. Off.

ONLY Scrapers in the World with ALL These Profit-Making Features

Easier Loading

Because of generous initial apron opening without movement of rear gate. Curved bowl design plus smooth interior and special offset cutting edges produce continuous "fountain action" in loading, while exclusive eccentric hoist sheaves permit effective "pumping" in loose material.

Easier Hauling

Thanks to lower draft, shorter wheel base and elimination of excess weight. Newly designed apron retains load under all conditions.

Faster, Cleaner Dumping

Because of positive forced ejection. Rear gate actually bulldozes the material out, scraping bottom and sides of bowl perfectly clean. High lifting apron moves ahead with rear gate, assuring speedy unloading of all materials, without sticking or jamming.

More Accurate Spreading

Assured by improved positive control.

Greater Stability

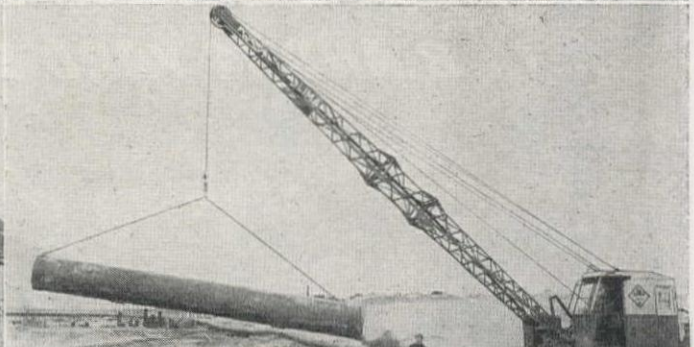
Thanks to low center of gravity and freedom from bulky overhead structures.

Greater Utility

Because wide, open-top bowl also permits overhead loading with shovel, drag-line or bin.

LaPLANT CHOATE

EARTHMOVING AND LAND CLEARING EQUIPMENT



SOME DAY YOU ARE GOING TO BUY A 3/4 yd. Limaster

When you buy your next 3/4 yard shovel, crane, dragline or pull-shovel you can make no better choice than a LIMA *PAYMASTER.* The *PAYMASTER* is relatively light in weight yet rugged enough to withstand the most severe conditions encountered in hard digging. It is equipped with an 18′ box type boom and 15′ tubular type dipper handle. When equipped as a shovel the *PAYMASTER* can easily be converted to a crane, dragline or pull-shovel or conversely without major dismantling. Such an advantage makes the *PAYMASTER* an efficient tool, adaptable to many kinds of work. A LIMA shovel, crane or dragline is identified by the Diamond on the cab. The LIMA Diamond is a symbol of 75 years of quality workmanship and dependable service.

Write now for a copy of bulletin No. 034C.

LIMA LOCOMOTIVE WORKS, Incorporated
SHOVEL and CRANE DIVISION LIMA, OHIO

NEWARK, N. J. NEW YORK, N. Y DALLAS, TEXAS MEMPHIS, TENN.
SEATTLE, WASH PORTLAND, OREGON SAN FRANCISCO, CALIF. SPOKANE, WASH.
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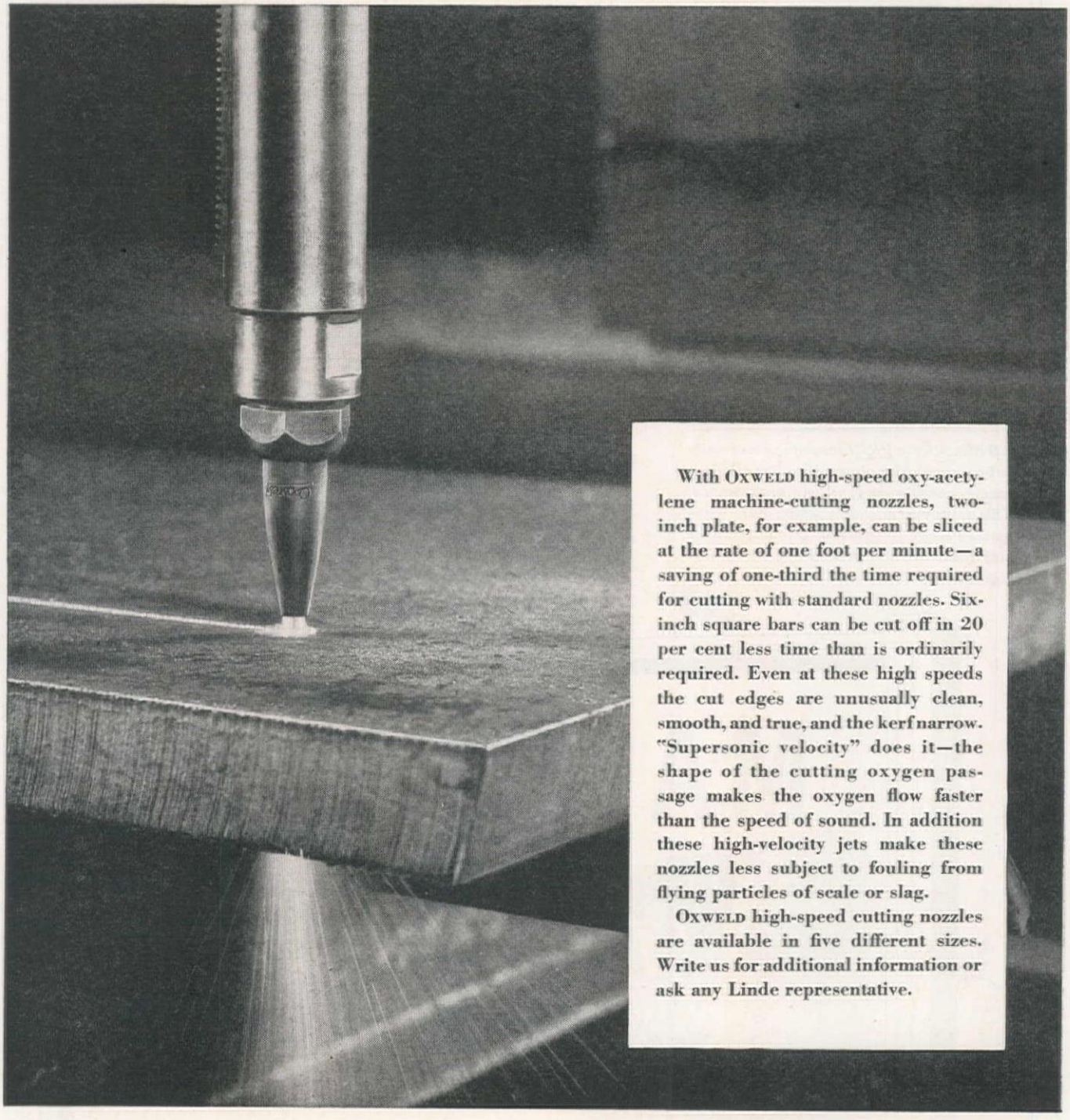
LIMA

LIMA

SHOVELS • DRAGLINES • CRANES • PULL-SHOVELS

Seattle Office: 1932 First Ave. So.; Feenaughty Machinery Co., 112 S. E. Belmont St., Portland, Ore.; Feenaughty Machinery Co., 600 Front St., Boise, Ida.; Garfield & Co., 1232 Hearst Bldg., San Francisco, Calif.; Smith Booth Usher Co., 2001 Santa Fe Ave., Los Angeles, Calif.; Smith Booth Usher Co., 1756 Grand Ave., Phoenix, Ariz.; Heid & McCoy Machinery Co., 3201 Brighton Blvd., Denver, Colo.; Steffeck Equipment Co., Main and Cutler Streets, Helena, Mont.; Willard Equipment Ltd., 860 Beach Ave., Vancouver, B. C., Canada; Western Machinery Co., 748 W. 8th St., Salt Lake City, Utah; Contractors' Equipment & Supply Co., Springer Bldg., Albuquerque, N. Mex.; Wells Alaska Motors, Fairbanks, Alaska; Modern Machinery Co., Inc., N. 2417 Division St., Spokane, Wash.

OXWELD HIGH-SPEED NOZZLES CUT STEEL NEARLY 50 PER CENT FASTER THAN STANDARD CUTTING NOZZLES



With OXWELD high-speed oxy-acetylene machine-cutting nozzles, two-inch plate, for example, can be sliced at the rate of one foot per minute—a saving of one-third the time required for cutting with standard nozzles. Six-inch square bars can be cut off in 20 per cent less time than is ordinarily required. Even at these high speeds the cut edges are unusually clean, smooth, and true, and the kerf narrow. "Supersonic velocity" does it—the shape of the cutting oxygen passage makes the oxygen flow faster than the speed of sound. In addition these high-velocity jets make these nozzles less subject to fouling from flying particles of scale or slag.

OXWELD high-speed cutting nozzles are available in five different sizes. Write us for additional information or ask any Linde representative.

BUY AND HOLD UNITED STATES VICTORY BONDS AND STAMPS

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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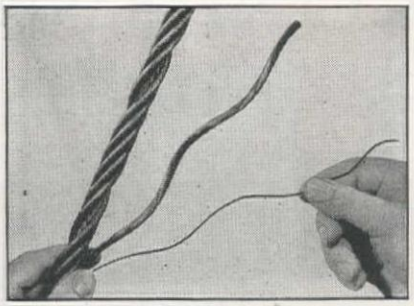
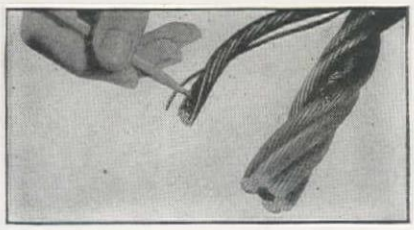
In Canada: Dominion Oxygen Company, Limited, Toronto

The word "Oxweld" is a registered trade-mark of Union Carbide and Carbon Corporation

For maximum safety, service, economy



All wires and strands in Macwhyte PREformed are spiral shaped to fit naturally into position. When you select Macwhyte PREformed you get "the correct rope for your equipment," plus a personal interest in helping you get the most out of your rope.



All Macwhyte PREformed is internally lubricated! Macwhyte Wire Rope Lubricant is packed around each wire in all strands. This improves the sliding action of the wires as they move in bending around sheaves and drums. It also protects against inside corrosion.

You make sure of the best when you buy Macwhyte PREformed. It's a rope with less internal fatigue, less friction, better balance and longer life. It's a safer, easier-to-use rope. These extra advantages are acquired through PREforming — every strand is shaped to take its place *naturally* in the rope. Internal stresses are held to a minimum.

The wire that goes into Macwhyte PREformed is processed under constant metallurgical control in Macwhyte's own wire mill. And when this tough, flexible wire is assembled into strands, PREformed and internally lubricated under close supervision of Macwhyte wire rope craftsmen, it just has to be the correct rope for your equipment.

Macwhyte PREformed is especially recommended for your extra-tough jobs, though many wire rope users tell us it pays them to specify this superior rope for all operations. They say its greater life makes it cost less in the long run.

Get this Macwhyte Wire Rope Catalog!

170 pages of useful information. A request on your company letterhead will bring it to you promptly. Ask for Catalog G-15.

MACWHYTE COMPANY

Wire Rope Manufacturers

2909 Fourteenth Avenue, Kenosha, Wisconsin

Mill Depots: New York • Pittsburgh • Chicago • Fort Worth • Portland • Seattle
San Francisco • Distributors throughout the U. S. A.

MACWHYTE PREformed and Internally Lubricated Wire Rope... MONARCH WHYTE STRAND Wire Rope ... MACWHYTE Special Traction Elevator Rope ... MACWHYTE Braided Wire Rope Slings ... MACWHYTE Aircraft Cables and Tie-Rods ... MACWHYTE Stainless Steel Wire Rope, Monel Metal Wire Rope, Galvanized Wire Rope

NO. 837

Time now To Count the Cost...

Through the war years, the cost of the job was secondary to *getting that job done.* But from now on, COST—both operating and maintenance—will be the all-important factor in the purchase of new heavy-duty earth moving and material handling equipment. When it comes to deciding what kind of power will operate that equipment at lowest cost, don't overlook the proved-on-the-job advantages of high-speed Cummins Dependable Diesels . . . their demonstrated reliability and long life . . . their easy, economical maintenance and service . . . their high horsepower output per pound of engine weight. Models for all types of power applications . . . automotive, portable or stationary . . . 50 to 275 hp.

CUMMINS ENGINE COMPANY, INC.
Columbus, Indiana

THE DOCTOR HAS PRESCRIBED . . .

Rx viae durae atque bonae sine fine *

DOCTORS ARE UNABLE TO REACH THOUSANDS OF FAMILIES QUICKLY

Rx viae durae atque bonae sine fine

EVERYTHING WE EAT AT SOME TIME OR OTHER MUST TRAVEL A ROAD OR HIGHWAY

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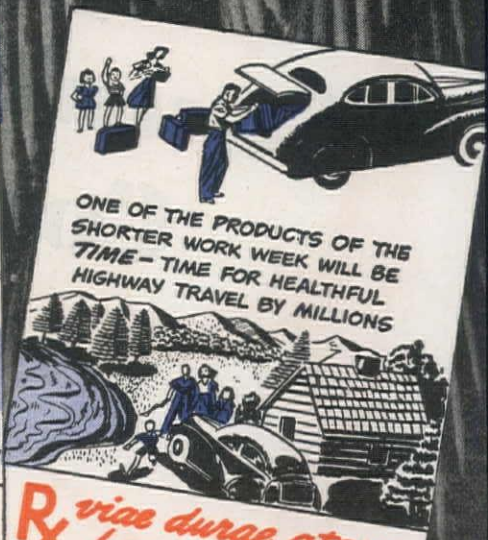

ONE OF THE PRODUCTS OF THE SHORTER WORK WEEK WILL BE TIME – TIME FOR HEALTHFUL HIGHWAY TRAVEL BY MILLIONS

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43% OF THE COMMUNITIES IN THE UNITED STATES RELY EXCLUSIVELY ON MOTOR CARRIERS.

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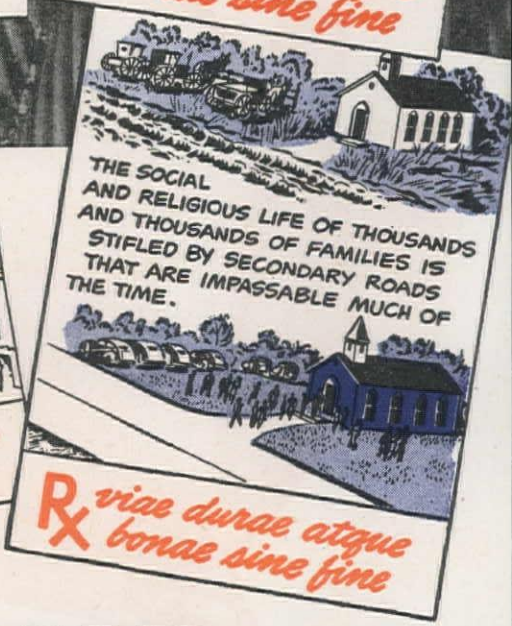


THE SOCIAL AND RELIGIOUS LIFE OF THOUSANDS AND THOUSANDS OF FAMILIES IS STIFLED BY SECONDARY ROADS THAT ARE IMPASSABLE MUCH OF THE TIME.

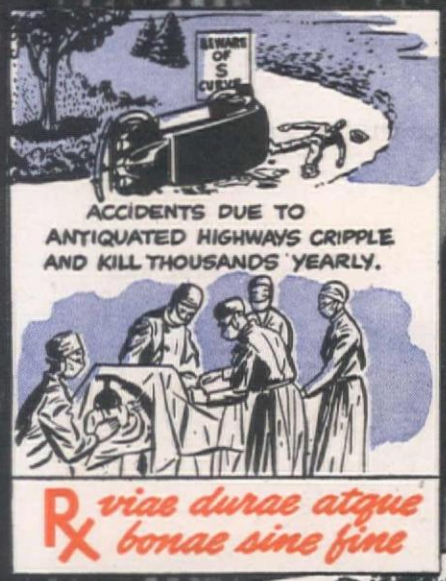
Rx viae durae atque bonae sine fine

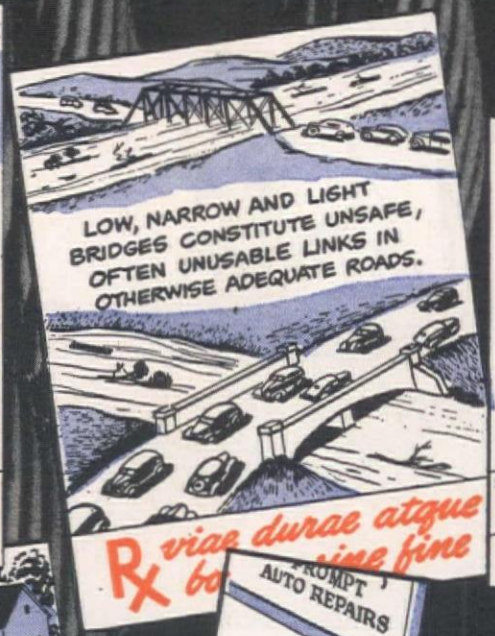
POSTWAR CARS ARE ALREADY COMING OFF PRODUCTION LINES. HIGHWAYS AND STREETS MUST BE BUILT SPEEDILY TO AVOID CONGESTION

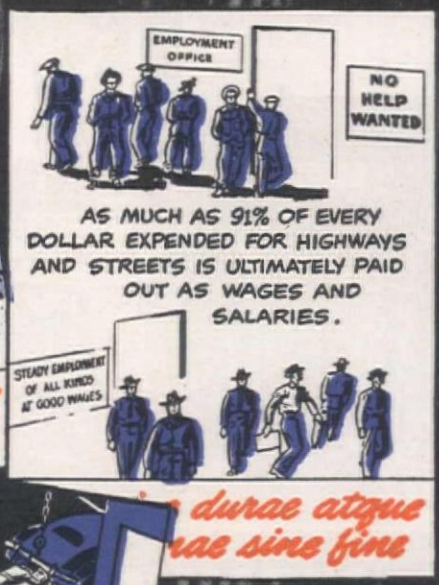
Rx viae durae atque bonae sine fine

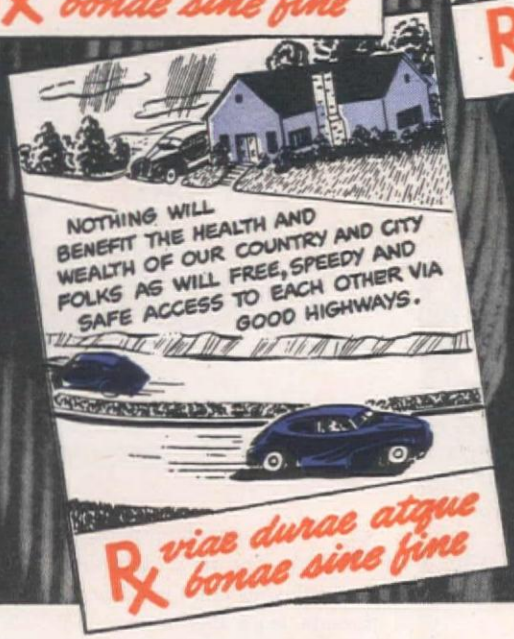
union *Wire Rope*

union-formed is *Preformed* TO OUTPERFORM









THE DOCTOR HAS PRESCRIBED...

✱HARD AND GOOD ROADS WITHOUT END

Not only has the doctor written this prescription—he has earmarked funds to pay half the cost of a 3 year course of medicine.

The other half (1½ billion dollars) must be raised by 48 patients. The will to get well of a majority of them is at a low ebb. Only 7 states have sufficient plans for the first year of the program. Plans for highway projects ready to let amount to less than half the medicine apportioned by the doctor for the first year to say nothing of the other 2½ years.

A lot of nursing is yet necessary. If a large highway construction program is to be gotten under way in 1946, then everyone in the industry and profession must turn nurse and help the doctor coax the patients to take their medicine. Otherwise, men will go unemployed, traffic will snarl and the next dose of medicine will be plenty bitter for lovers of the American way of life to take.

UNION WIRE ROPE CORPORATION, 2146 Manchester Ave., Kansas City 3, Mo.

☐ Send a Free copy of book entitled "The Road Ahead"
☐ Send a Free copy of book entitled "Put Your Town on the Air Map"

Name.....

Firm .....

Address..... *City*..... *Zone*... *State*.....

E-45

★ **MANEUVERABILITY**

The Silver Eagle 5th wheel type trailer equipped with dual pneumatic tires means time saving, smooth, economical transport and adaptability to all types of terrain

★ **SAFETY IN TRANSPORT**

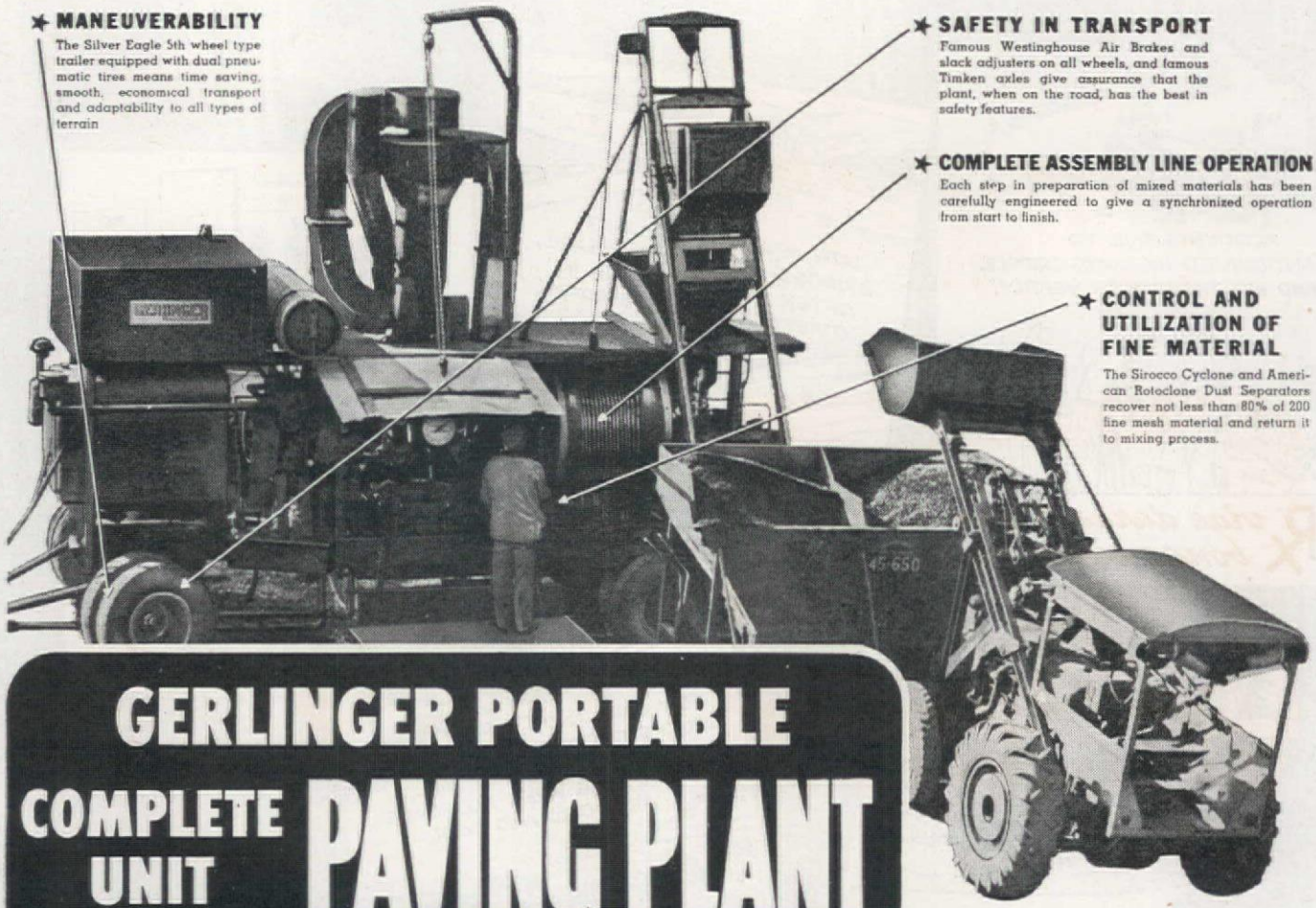
Famous Westinghouse Air Brakes and slack adjusters on all wheels, and famous Timken axles give assurance that the plant, when on the road, has the best in safety features.

★ **COMPLETE ASSEMBLY LINE OPERATION**

Each step in preparation of mixed materials has been carefully engineered to give a synchronized operation from start to finish.

★ **CONTROL AND UTILIZATION OF FINE MATERIAL**

The Sirocco Cyclone and American Rotoclone Dust Separators recover not less than 80% of 200 fine mesh material and return it to mixing process.



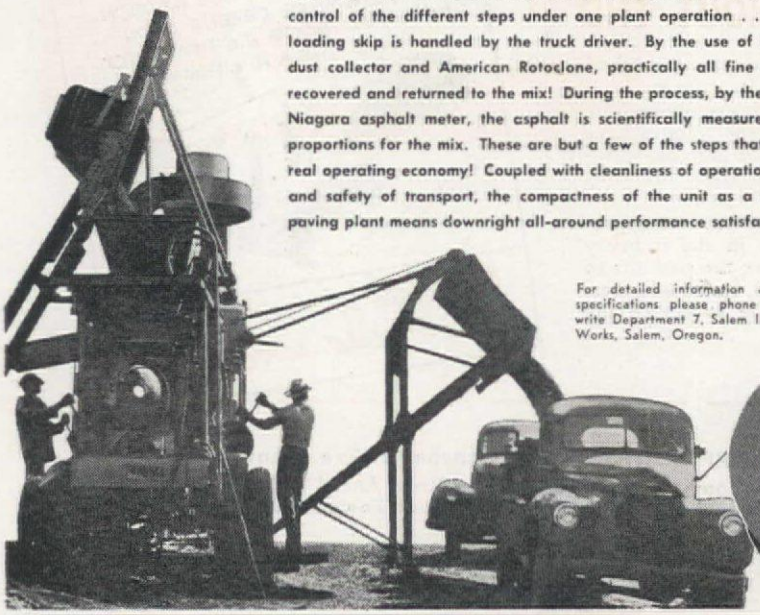
GERLINGER PORTABLE COMPLETE UNIT PAVING PLANT

Now, more than ever before *Top Producer* of Asphaltic Concrete and Hot Mix!

EACH STEP in the operation of this plant has been engineered to give the maximum production . . . not less than 90 tons of mixed materials per eight-hour shift It has been engineered to mechanize and centralize the control of the different steps under one plant operation . . . only the loading skip is handled by the truck driver. By the use of the Sirocco dust collector and American Rotoclone, practically all fine material is recovered and returned to the mix! During the process, by the use of the Niagara asphalt meter, the asphalt is scientifically measured in exact proportions for the mix. These are but a few of the steps that add up to real operating economy! Coupled with cleanliness of operation, the ease and safety of transport, the compactness of the unit as a whole, this paving plant means downright all-around performance satisfaction.

★ The outstanding performance record of this Gerlinger Paving Plant is achieved through extra advantages that have been "engineered in" to its operation. Mechanical loading units of over 1000 lbs. capacity. Centralized air valve controls. Pug mill, twin-shaft type, mounted in anti-friction bearings, capable of thorough mix in 60 seconds or less. Fully equipped Budda Diesel engine Niagara asphalt meter. Bearings throughout are anti-friction mounted in dust-proof housings. Worthington Air Compressor.

S-1



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

GERLINGER PRODUCTS

A PRODUCT OF SALEM IRON WORKS SALEM OREGON

TEST PROVES TRITON CUTS COSTLY CARBON

1. Most carbon in gasoline engines is caused by the motor oil. And carbon causes many engine troubles. Less carbon means less overhaul cost.

2. Triton Motor Oil, in comprehensive tests, proved to contain less carbon-forming elements than any of seven premium oils sold in the West.

3. Triton is a 100% pure paraffin-base lubricant carefully refined by Union's exclusive propane-solvent process. It offers the finest type of lubrication and cuts costly carbon.

4. Give Triton a trial. You'll find that its low carbon-forming tendencies will help eliminate knock, save gasoline, lengthen the life of engines, and reduce maintenance expense.

Your Union oilman—or the Union Oil Company, Los Angeles 14, Calif.—will gladly deliver a supply.

TRITON
MOTOR OIL

ANOTHER UNION OIL 76 SUCCESS-TESTED PRODUCT

Affiliate Member, Associated General Contractors of America

WORLD'S NUMBER 1 TRUCK!

When you buy a Mack, you buy a truck that is built to work harder, longer, and at a lower per-day cost than any other truck in the world. Why? Because of Mack quality factors, such as the liberal use of heat-treated steel alloys; tetrapoid instead of conventional gears; with rubber shock insulators instead of the usual spring shackles; and wristpins finished to one ten-thousandth of an inch.

Forty-five years of experience and craftsmanship go into the making of every Mack Truck you buy today. And the records of American business, in every field in which trucks are used, prove over and over again that "You can't beat a Mack for performance."

Macks have been making money for their owners for nearly half a century. Now is the time to find out what Macks can do for you.

★ BUY THAT VICTORY BOND TODAY ★

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

Mack

TRUCKS FOR EVERY PURPOSE

ONE TON TO FORTY-FIVE TONS

Performance Counts

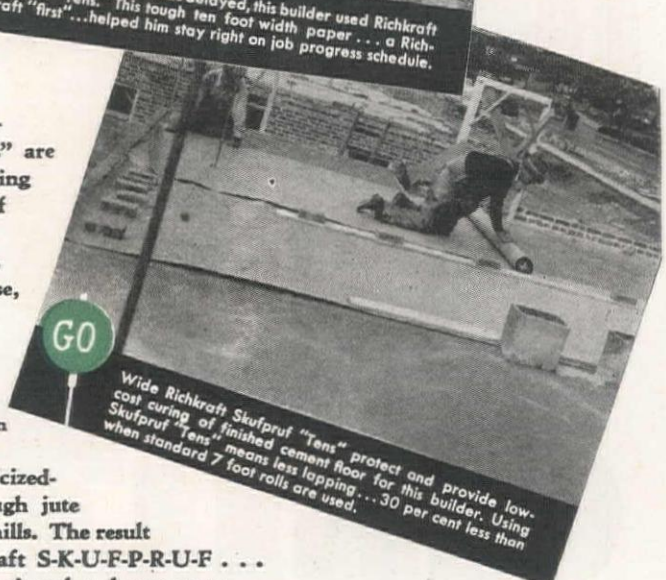
Richkraft

SKUFPRUF GREEN

...The Go Sign to ...keep your jobs rolling

Richkraft paper makes the job of subfill protection easier and economical. This builder is "keeping his job rolling" ... and meeting Fed. Spec. UUP 264 ... with Richkraft.

When roofing material was delayed, this builder used Richkraft Skufpruf "Tens." This tough ten foot width paper ... a Richkraft "first" ...helped him stay right on job progress schedule.



Wide Richkraft Skufpruf "Tens" protect and provide low-cost curing of finished cement floor for this builder. Using Skufpruf "Tens" means less lapping ... 30 per cent less than when standard 7 foot rolls are used.

HERE'S a real building paper . . . designed by construction men for construction uses . . . Richkraft Skufpruf "Tens" are our 10 foot rolls—the perfect width for curing floors, protecting materials stored in the open, etc. This ten foot width of Skufpruf covers 30 per cent more floor area with fewer laps . . . less labor.

Fewer laps mean fewer chances for floor damage. Added up, it means less labor—less trouble—more profit per job. (Of course, Skufpruf is available in regular standard sizes too.)

All Skufpruf paper has been given our special Plasticizing Treatment . . . not the surface or "Puddle treatment" commonly offered . . . Skufpruf Plasticizing is done to the raw kraft pulp itself. This means Richkraft Plasticizing becomes an integral part of the paper . . . a part of the wood fibre itself.

Here's what Richkraft Skufpruf is: Two sheets of plasticized-treated kraft, EACH coated with asphalt and combined with tough jute reenforcing . . . all done in one of the world's most modern mills. The result is a waterproof, scuffproofed paper, second to none. Richkraft S-K-U-F-P-R-U-F . . . easily identified by its green tint . . . Skufpruf Green . . .The go sign that keeps your jobs rolling in all kinds of weather. Write for the booklet "The Mills Behind Richkraft."

The RICHKRAFT Company

General Offices: Builders Building, Chicago 1, Illinois

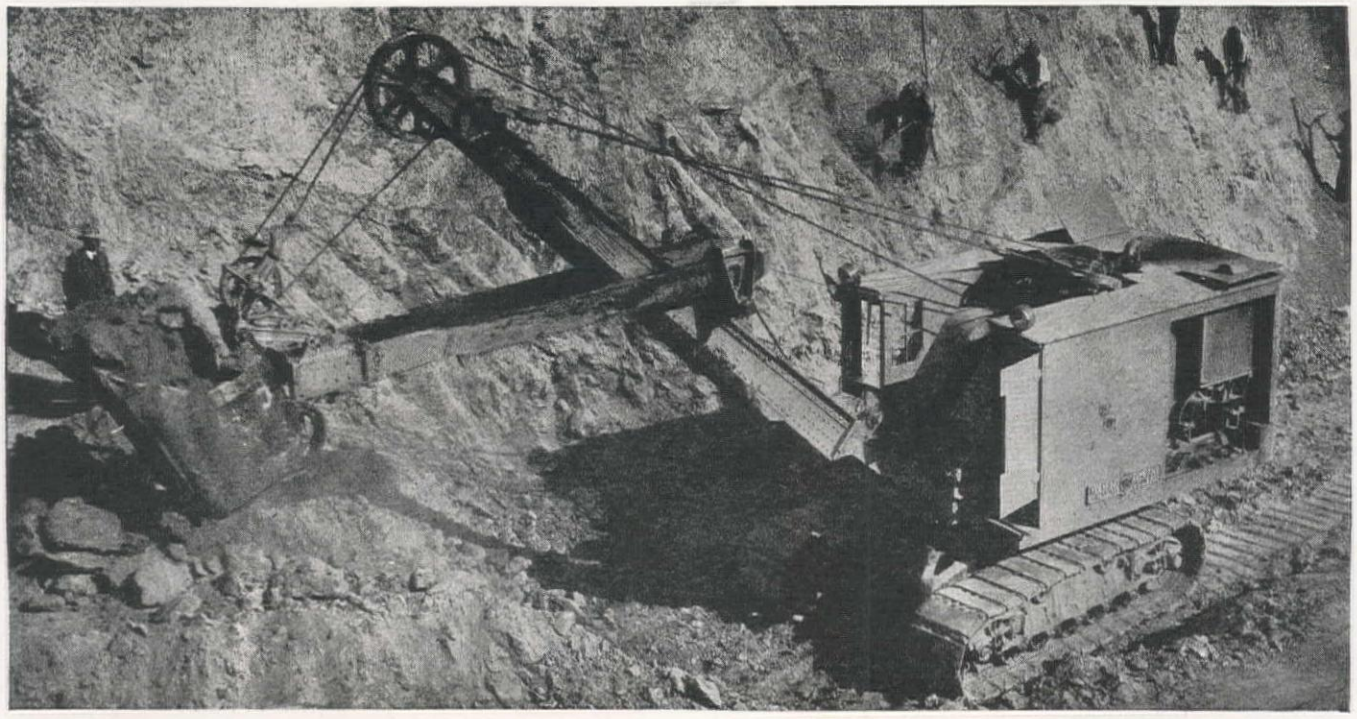
Eastern Office: Westport, Conn., Western Office: Pacific Building, Oakland 12, Calif.

and Progressive Dealers . . . Nationwide . . . With Stocks On Hand Waiting to Serve You.

General Distributors: PACIFIC COAST AGGREGATES, INC., 85 Second St., San Francisco, SUtter 8940

Distributing Yards at San Francisco, Oakland, Emeryville, Berkeley, Daly City, San Jose, Stockton, Fresno, Sacramento

***Road Distributors:* Nelson Equipment Co., Portland, Spokane, Seattle, Boise, Idaho**



TOUGH STUFF...a typical example of ESCO Dipper Performance...

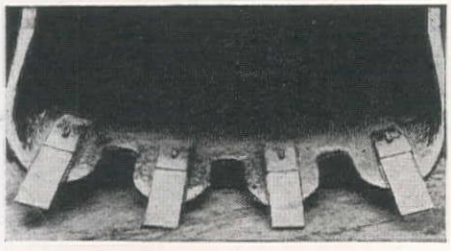
NOT A BIT OF POWDER was used on this cut. It was hard, tough stuff. But not too tough for this ESCO Dipper. Here's why ESCO Manganese Steel Dippers can perform so well on jobs like this:

LIGHTER IN WEIGHT—every pound of metal not needed for *strength* or *wear-resistance* is engineered out.

MORE DURABLE—the design assures the *distribution* of all strains *uniformly* throughout the dipper—and all parts subjected to wear and shock are amply reinforced.

STRONGER—every step in manufacturing, from the refining of the steel to the heat treatment of the finished castings, is *laboratory controlled* with the most precise methods.

BETTER DIGGING—the teeth fit into the front itself, eliminating the usual bulky tooth holder which must be forced through the muck or hard-pan. The sharp edge of the exclusive web support provides the *scooping action* for easier loading.



ESCO *CLEAN-CUTTING front. The unusual strength of the one-piece manganese steel front permits extra length between tooth point and edge of lip, increasing its digging ability.*

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A Byword in Wire Rope:

— FOR 6 BIG REASONS!

YOU LEARN A GREAT DEAL from individual service records about the efficient performance, the low average cost of Roebling "Blue Center" Steel Wire Rope. But records tell you only part of the story . . . of its toughness, its reserve strength, its basic dependability under *all* conditions of operation.

What makes "Blue Center" a rope you can choose with full confidence? The Roebling ***reputation,*** for one, and the superior Roebling-made ***steel*** in the wires.

There's the ***skill*** born of a century's experience that goes into the rope's fabrication, the modern, unsurpassed ***facilities*** used.

Add to the never-ending ***research*** that gives you longer rope life, the practical ***engineering*** that assures the best rope for your purpose.

Remember those facts when you order from America's first wire rope maker. They back up the performance you can expect from every reel of Roebling Wire Rope, preformed or non-preformed . . . and every correctly designed Roebling "Blueclad" fitting.

Now that increasing quantities of Roebling Wire Rope are available, we suggest you place your orders early. Call or write our nearest office . . . a Roebling engineer will help you select the correct rope and get full productive life from it.

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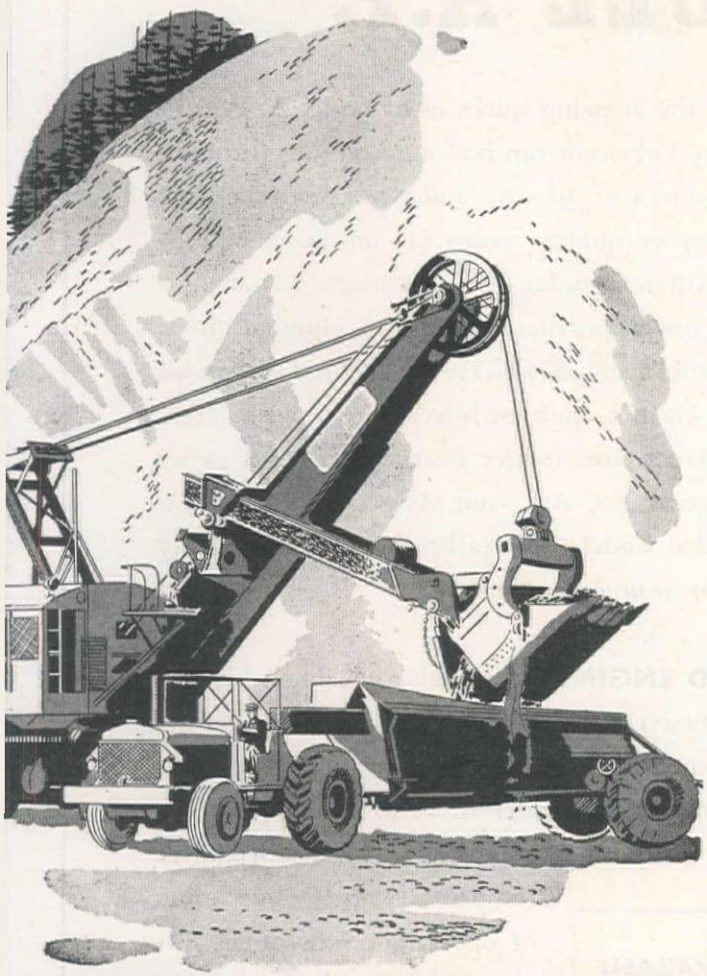
OF CALIFORNIA
San Francisco • Los Angeles • Seattle • Portland

Wire Rope and Strand • Fittings • Slings • Cold Rolled Strip • Round and Shaped Wire • Wire Cloth and Netting • High and Low Carbon Acid and Basic Open Hearth Steels • Aircord, Swaged Terminals and Assemblies • Suspension Bridges and Cables • Electrical Wires and Cables • Aerial Wire Rope Systems

ROE

PACEMAKER IN

"BUY ROEBLING"



ROPE REMINDERS

Proper maintenance of wire rope pays off. And it's also a good slogan to remember in keeping comparative records of wire rope service.

It's desirable to keep accurate, complete records to check on operation. But even the most carefully kept records may be misleading, unless correctly analyzed.

For example, time on the job is not necessarily a yardstick of service. Ropes working less than average may have to contend with corrosion. Besides, a rope that operates only a few days a month may get less attention and care than a steadily working one.

The one invariable rule in record-keeping is that each installation must be considered individually. That's where Roebling engineers can be of invaluable service to you. They know wire rope, and they've had experience with a wide variety of rope-operated installations. It will pay you to consult them.

BLING

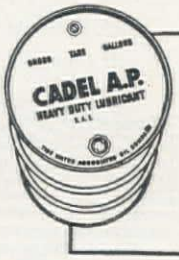
JR ROEBLING

WIRE PRODUCTS

"All My Equipment Uses CADEL A.P."

Convincing proof of the amazing qualities of Cadel A. P. (all-purpose) Heavy Duty Lubricant can be found on jobs throughout the West — in engines of all sizes and types, both gasoline and diesel. Its *all-purpose* quality means (1) on-the-spot lubrication of *all* your equipment under field conditions, (2) smaller oil inventories and fewer purchases, and (3) elimination of lubricating errors. Cadel's special *detergent-inhibited-dispersive* properties offer you cleaner engines, lower engine wear, freer piston rings and valve stems, longer bearing life, and easier starting at low temperatures. Ask your Associated Representative for proof of what Cadel A. P. (all-purpose) Heavy Duty Lubricant will do for *your* equipment.

TO CLEAN FOULED ENGINES: Cadel A. P. is so high in detergency and dispersiveness that it will clean and purge deposits previously formed in engines by oils not possessing these characteristics. When you use Cadel A. P. in your equipment for the first time, it is recommended that it be drained after the first 500 miles or 25 hours of operation. Subsequent fills at normal drain periods will render — and keep — engine surfaces free from these objectionable deposits.



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LET'S GET ASSOCIATED

BUY and HOLD VICTORY BONDS

Now it is Easier than Ever to Choose the Right Truck

White Trucks PLUS White Personalized Service point the way to lower costs.

White Truck Model WA-20
Photo Courtesy Manning Bros., Los Angeles

Thousands now know why White Trucks were able to make an outstanding record in wartime operations. The White Personalized Service Plan was the deciding factor that kept overworked equipment rolling. Today this service program is acknowledged to be the truck industry's most comprehensive plan for keeping trucks on the road.

Now, in peacetime, this plan will offer you as a White owner the tailored, proven protection that will enable you to get lower transportation costs. You can plan for bigger profits when you have your new White Trucks on your job. Each will be backed by a maintenance "know-how" that reduces costs and saves important maintenance-manhours.

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FOR MORE THAN 45 YEARS THE GREATEST NAME IN TRUCKS

Lithographed on stone by Edward A. Wilson

Illustration shows installation of cast iron flexible joint subaqueous pipe line specified for the required service conditions. How to do it when you get the go-ahead is a problem we are always glad to help out on if it involves pipe design, or recommendations as to pipe and fittings which have successfully met similar problems. To see that our product is correctly specified for the purpose intended is an important function of our sales engineering and technical staffs. Forty-five years' experience as largest producers of cast iron pipe is behind them and always at your service.

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Here's a sturdy, nimble ½-yard excavator with compact, streamlined design . . . built for safe, efficient operation. Fast, finger-tip responsiveness. All controls within easy reach of operator. Automatic, foolproof traction brakes. New full vision cab, equipped with shatter-proof glass, promotes safety and increases operating efficiency.

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A 4873-1P-C

Read the inside dope.... here's why Winslow filters thoroughly clean lube oil

CLEAN INSIDE AND OUT

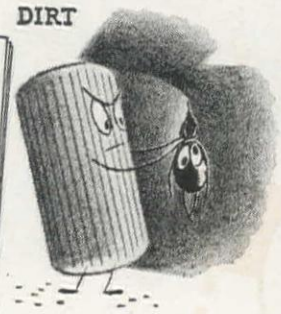
All acid and most of the injurious gums and resins are removed by neutralizing agents in Winslow Oil Conditioners.

KEEPS WATER OUT

Very little moisture can penetrate Winslow's water repellent surface...

(Even if it did-the absorbent fibers inside would promptly drink it up).

SQUEEZES OUT DIRT



The filter channel narrows from the outer surface toward the center like a piece of pie so that larger particles of dirt are first deposited and smaller ones later removed. As a result, foreign matter is deposited evenly through the element and not only on the outside ring.

EXPANDS WITH USE

The curly cellular wood fibers within the Winslow Element straighten out and expand instead of becoming compressed as they absorb moisture, acid and other impurities-insuring free flow and effective filtering for longer periods of operation.

WRITE today for FREE BOOKLET which ends all filter mysteries in 20 fact-filled, color pages similar to those above.

Distributors—Jackson Implement Co., Portland; Wait Motor Supply Co., San Francisco; Burklyn Company, Los Angeles; Dewalt Disher Corp., Ltd., Vancouver, B. C.

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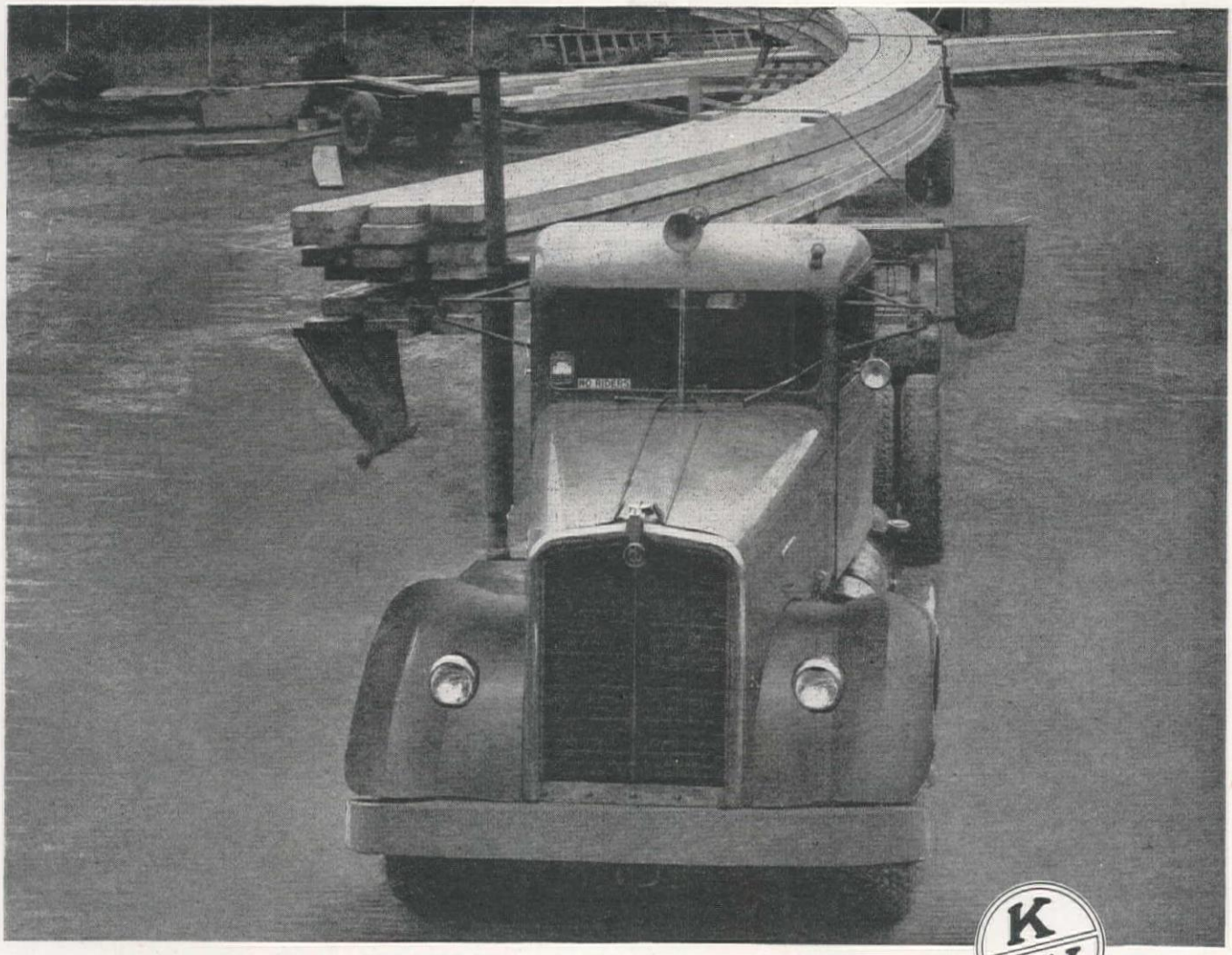
WINSLOW

FUEL FILTERS • OIL CONDITIONERS • ELEMENTS



Construction Ahead

Millions are to be spent in construction. New homes, new factories, public buildings, roads and other projects—postponed because of the war emergency—are now the first order of business.

The many heavy duty Kenworth trucks now in the field and the new ones coming off the Kenworth production line will play an important role on these widespread construction projects. Big loads of materials will be moved onto the jobs efficiently, quickly and economically aboard Kenworth trucks.

Transportation firms and contractors have learned from experience to depend on custom-built Kenworth trucks, specially designed for the job, to deliver greater payloads at top performance throughout a longer truck life.

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TRUCKS ★ BUSES ★ TRAILERS ★ FIRETRUCKS

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Rugged Enough FOR THE DIVE BOMBER

VICKERS HYDRAULIC CONTROLS

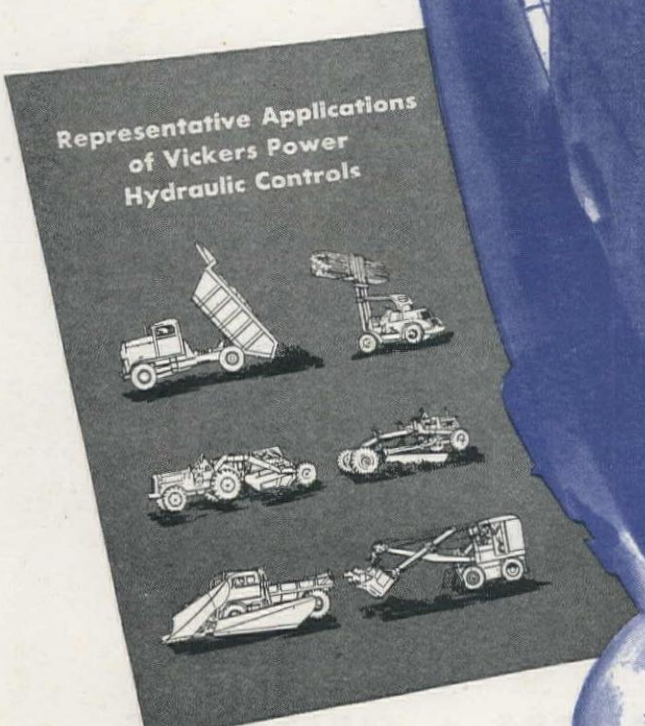
ALSO make Construction Equipment MORE DEPENDABLE

When a dive bomber pilot pointed the nose of his plane at the target and began that lightning-like dive, his life and hitting the target depended on the plane's controls. Vickers produced the dependable power hydraulic controls which, in spite of difficult weight limitations, met these exacting dive bomber standards. Vickers also produced dependable controls for many other types of important war implements.

Dependable controls are vital in construction equipment too. While life and the turn of battle do not depend on them, many other factors of importance do.

Vickers Power Hydraulic Controls for construction equipment have the same dependability which met the crucial test of battle in war machines on every front. These controls will take all the smashing, pounding shocks that construction equipment must withstand. They are simple, flexible, inherently self-lubricated, rarely need maintenance . . . assure immediate response to "finger-touch" on the operating lever, no matter how heavy the job.

Specify Vickers Power Hydraulic Controls . . . and get the most modern, fast-working construction equipment.



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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

4½ years on the "Water" Front

The hose shown here is a Goodyear Water Suction Hose, put in service 4½ years ago by a large Texas construction company upon recommendation of the G. T. M.—Goodyear Technical Man. It has been used in tough construction, suction and cofferdam work ever since and, as you can see, it is still in good condition — proof of its extra ruggedness and durability. That's just the kind of long-lived, money-saving performance you can expect from all Goodyear Industrial Rubber Products — Hose, Belting, Molded Goods and Packing.

TO ORDER: phone your nearest Goodyear Industrial Rubber Products Distributor — or write the G. T. M., Akron 16, Ohio or Los Angeles 54, California.

Here's what CECO gives you for faster low-cost road building

ACCURATE PRE-BIDDING INFORMATION

Ceco takes the guesswork out of bidding by supplying accurate data, so you can bid to get the job . . . and make money on it, too.

BLUEPRINTS OF ENGINEERING DETAILS

Ceco engineers do the detail work for you in supplying all engineering data on reinforcing and other materials for the job.

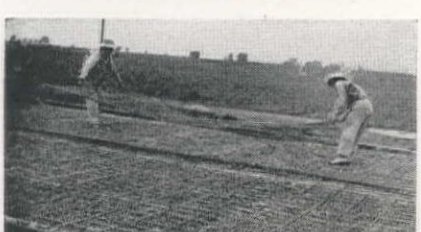
ONE ORDER DOES IT ALL

Ceco streamlines roadbuilding. In one complete order you can specify everything you need. Material is delivered as wanted and on time.

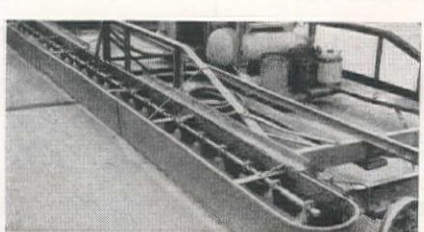
Metal center strip in place; dowel bars supported and ready for support; expansion joint in position.

22 CECO OFFICES AT YOUR SERVICE

There is a nationwide network of Ceco offices to serve you. So when you specify Ceco Highway Products, you know you get fast, dependable delivery from the nearest convenient warehouse . . . and always there's a Ceco engineer watching every detail . . . saving you time and money. Yes, here's highway service that's everywhere at once.



Placing the welded wire fabric, illustrating ease of handling.



Cecure compound applicator in operation—final step in highway building.

Investigate Ceco Cecure Curing Method

Ceco's new Cecure applicator offers these advantages:

1. **Gives positive application of Cecure curing compound.**
2. **Works 20 times faster than old style method.**
3. **Provides uniform curing — reducing danger of cracking.**
4. **One operation does the job.**

CECO STEEL PRODUCTS CORPORATION

Highway Products Division—5701 W. 26th St., Chicago, Ill.

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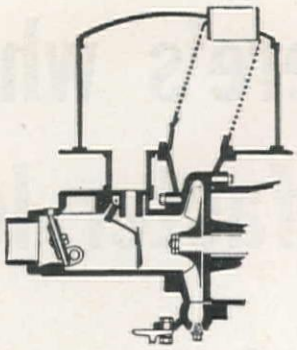
Convenient Check List of Ceco Highway Products

Welded Wire Fabric • Metal Center Strip • Dowel Bars • Stake Pins • Dowel Bar Supports • Expansion Joints • Dowel Bar Sockets • Cecure Compound • Sub-Grade Paper

ENGINEERING MAKES THE BIG DIFFERENCE IN CECO CONSTRUCTION PRODUCTS

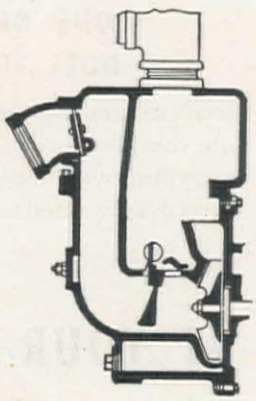
1.

Centrifugal pumps are very efficient . . . quiet, smooth and trouble-free . . . *but they won't prime themselves!* . . .



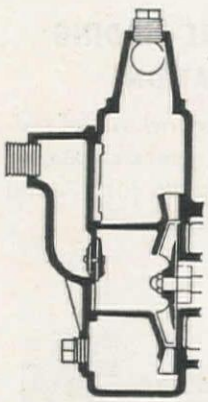
2.

Various auxiliary tanks with connecting ports or valves were developed to help centrifugals prime —an important step forward . . .



3.

Next, tank, valve and pump were assembled into one unit . . . a great improvement. But still, auxiliary devices or by-passes cut efficiency and make trouble . . .



4.

Finally, MARLOW has solved the problem by developing a pump without an auxiliary device or by-pass. The ability to self-prime is inherent in the ingenious design of the pump itself!

Thus, a Marlow self-priming centrifugal pump combines the advantages of centrifugal pumping with the ability to prime itself dependably and to keep going efficiently when other types fail. There is no other pump like a Marlow. Sizes 1½ to 10 inch; 50 to 3600 GPM.

Send for the free authoritative treatise, "Self-Priming Centrifugal Pumps." It tells, objectively, the superiority of the diffuser priming principle used in Marlow pumps. Ask, also, for catalog information covering the specific sizes of pumps in which you are most interested. Marlow Pumps, Ridgewood, N. J.

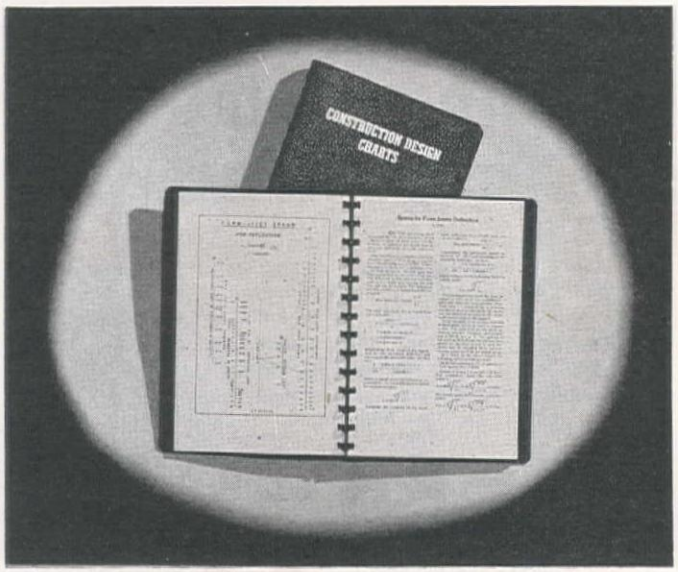
★ ENGINEERED BY MARLOW ★

Glenn Carrington Co., Seattle, Wash. (For Interior Alaska); Alaska-Pacific Supply Co., Seattle, Wash. (For Alaska Coastal Regions); General Machinery Co., Spokane, Wash.; Clyde Equipment Co., Portland, Oregon, and Seattle, Wash.; Montana Powder and Equipment Co., Helena, Mont.; Nickerson Machinery Co., Salt Lake City, Utah; Le Roi-Rix Machinery Co., Los Angeles, California; George M. Philpott Co., San Francisco, California; Burdick & Burdick, El Paso, Texas.

ENGINEERS — CARPENTERS — CONCRETE MEN — FOREMEN — SUPERINTENDENTS:

SOLVE ENGINEERING PROBLEMS . . . . . at a Glance!

There is no time to waste these days on tedious figuring of routine problems! This popular edition of CONSTRUCTION DESIGN CHARTS, by Professor James R. Griffith, gives countless engineering shortcuts—gives the answers to engineering and preliminary design problems in a flash! Engineers—carpenters—concrete men—foremen—superintendents—there's a whale of a value in this book for every man engaged in construction today!



This is the third reprinting of the CONSTRUCTION DESIGN CHARTS, and the contents are exactly the same as those which appeared in the original enlarged edition of 1943. This book contains 72 charts and has 150 pages filled with valuable information that will help you. Covered in sturdy black fabrikoid, stamped in gold, the book has a special metal binding that allows each page to lie flat for easy reference.

THIS NEW EDITION IS LIMITED—ORDER TODAY

The original edition of CONSTRUCTION DESIGN CHARTS disappeared like magic so there's no time to lose in getting your order in for this book. The latest reprinting of this popular book will be off the press within a few weeks. The supply is definitely limited because of the paper shortage. We suggest placing an order immediately.

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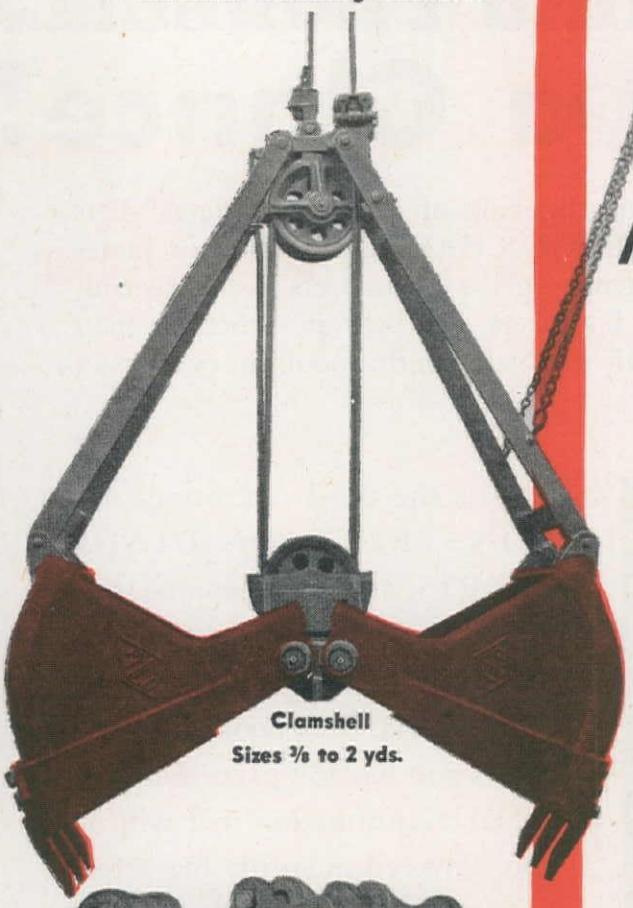
Position.....Company.....

America's most complete line of material handling buckets.



Clamshell
Sizes ⅜ to 2 yds.

WE BUILD ALL 4 MATERIAL HANDLING BUCKETS

PMCO ALL PURPOSE

- SHOVEL
- PULLSHOVEL
- DRAGLINE
- CLAMSHELL

We build a wider and more complete line of material handling buckets than any other manufacturer. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

FRONTS, BOTTOMS, SCOOPS, and TEETH, shown in red on buckets, are 14% manganese steel developing up to 120,000 tensile p.s.i. for long service life and hard abuse.

Experience Counts

See your shovel engineer or equipment dealer about PMCO Dippers and Buckets.

On the ½ yd. and ¾ yd. Shovel, Pullshovel, and Dragline Buckets, all teeth are interchangeable . . . a great advantage to operators.

Shovel
Sizes ⅜ to 18 yds.

Dragline
Sizes ⅜, ½, ¾, 1, 1½, 2, 2½ yds.

Pullshovel
Sizes ⅜, ½ and ¾ yd.

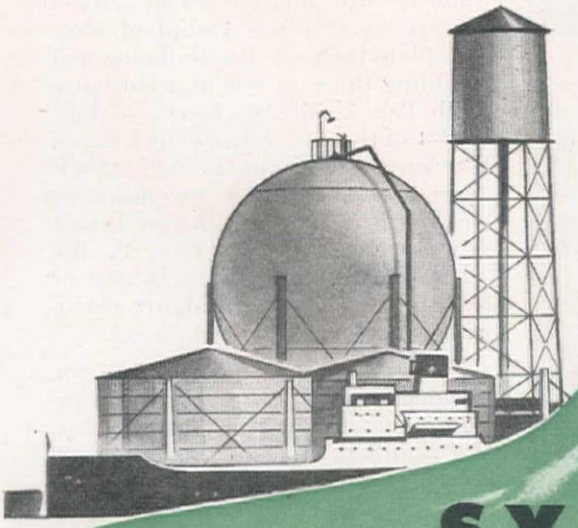
Quality Since 1880

PETTIBONE MULLIKEN CORP. CHICAGO 51, U. S. A.

WE OPERATE THE LARGEST AND MOST COMPLETE MANGANESE STEEL FOUNDRY IN THE UNITED STATES.

NOW

the modern way to make metals last



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1. Much greater rust resistance.
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4. No lead poisoning
5. Lower cost.

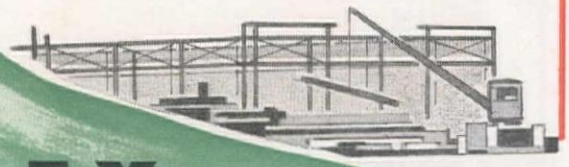
Syncro-Green is the outstanding Zinc Chromate primer *because*—

ZINC CHROMATE PIGMENT, the *only* known *active* rust inhibitive pigment...

+ **SYNFLEX,** quick dry, alkyd, water resistant resin, made exclusively by ourselves...

+ **OUR EXPERIENCE** through having manufactured over two million gallons of zinc chromate primer during the war...

= **SYNCRO-GREEN METAL PRIMER,** the primer that makes all metals last.



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METAL PRIMER

Manufactured by
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Write for Complete Details
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We are interested in learning more about Syncro-Green — the modern metal primer now released to industry.

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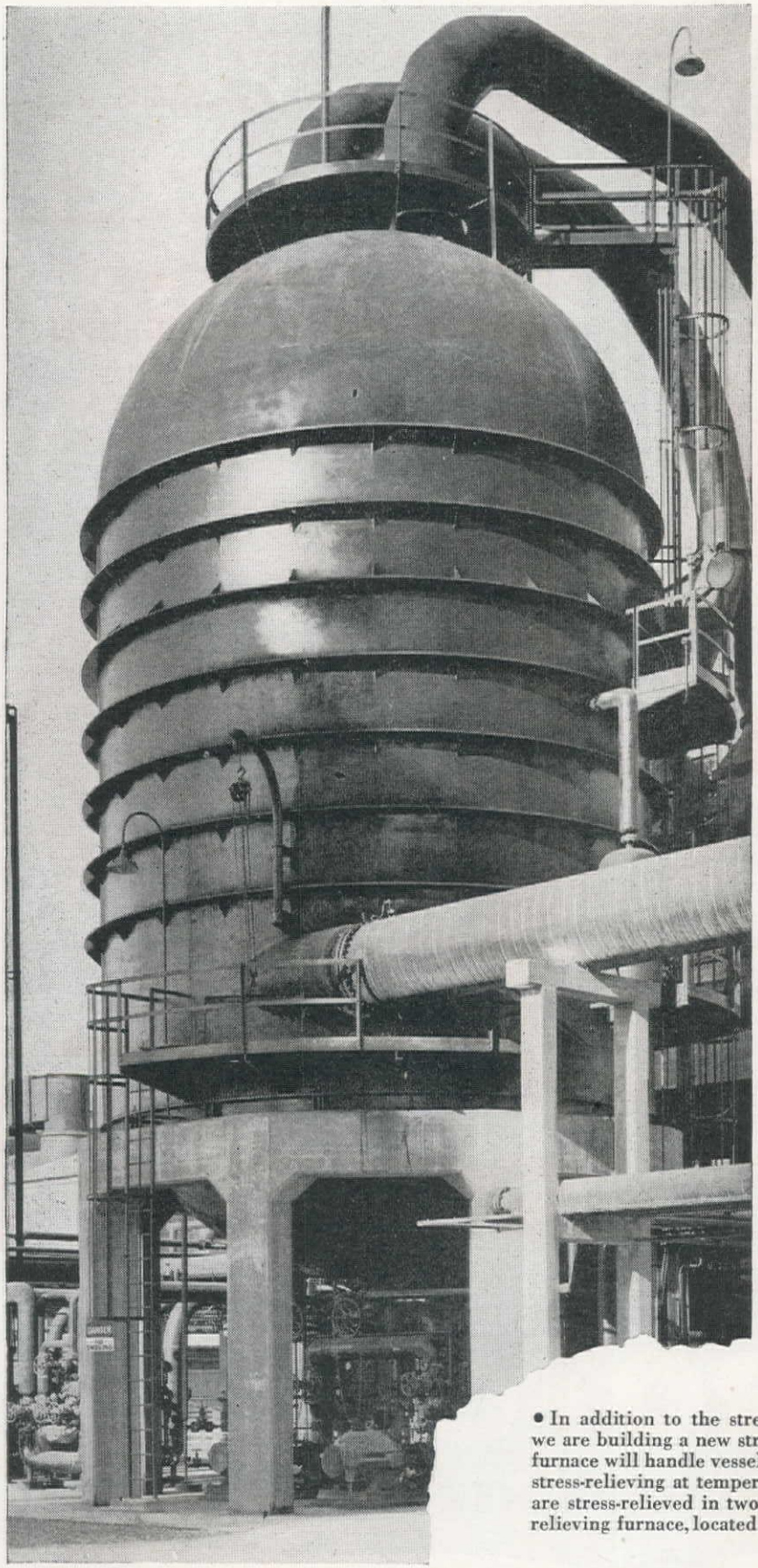

24-ft. diam. Vacuum Distillation Unit . . . for West Coast Fluid Catalytic Cracking Plant

The oil industry has developed many new processes to refine crude oil and petroleum gases into various petroleum products. The 24-ft. diam. by 21-ft. 6-in. high vacuum distillation unit shown at the left is typical of the equipment we furnish to the industry to aid in this work. The unit forms a part of the facilities that prepare stock for a catalytic cracker.

During the manufacturing, processing and storing of volatile liquids, industry uses many types of welded steel pressure vessels. Our plants have complete facilities for designing and building these vessels in accordance with Par. U-68, Par. U-69 and Par. U-201 of the ASME Code for Unfired Pressure Vessels or to API-ASME Specifications. When specifications require it we can furnish vessels that are stress-relieved or x-rayed. We also install special linings in new or existing vessels where highly corrosive conditions are encountered.

When selecting your source for welded steel pressure vessels, we invite you to write our nearest office for complete information and quotations. There is no obligation.

● In addition to the stress-relieving furnace at our Birmingham plant, we are building a new stress-relieving furnace at our Chicago plant. This furnace will handle vessels up to 13½ ft. in diam. by 83 ft. long, requiring stress-relieving at temperatures up to 2000° F. Vessels longer than 83 ft. are stress-relieved in two or more heats. (Construction of a third stress-relieving furnace, located at our Greenville, Pa., plant, will begin in 1946.)

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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
December, 1945 Vol. 20, No. 12

Still More Battles

THE WAR IS OVER, that is, the wars against Germany and Japan are over. Those were the wars against nations who sought to aggress against our allies and ourselves. The Atlantic Charter applied to those nations. Now, of course, both our forces (in China) and those of our allies are being used to aggress against other weaker peoples of different color. This we can dismiss with a wave of the hand, because the Atlantic Charter does not apply to them. It was conceived to make **us** look noble, not other people.

Closing our eyes, then, to affairs on far shores, we want seriously to call attention to the great battle which must be fought at home. This is the battle to restore American rights to the American people.

It is the battle against all the natural evils that follow in the wake of war—the concomitant of necessary regimentation of any people for the successful prosecution of any war.

It is therefore the battle against petty tyranny, arrogant officialdom, paternalism, government by men rather than government by law.

Let us admit first of all that most of the curbs and restrictions placed against our customary liberties in the process of regimentation for war were necessary. Also that for a people so unaccustomed to them they were both administered and endured as well as could be expected. In characteristic American fashion, we have bridled and we have griped, but we have also laughed them off. Now the time for laughing off is past.

For it is equally necessary to remind ourselves that freedom, which is a rare commodity in this world of today, is dearly bought, and retained only at the price of constant vigilance. Human rights are never regained as easily as they are relinquished.

No reasonable person will argue that certain restrictions upon the actions of either business, organized labor, or individuals are not necessary, even in peace-time. We had them before the war and we will have them now that it is over. The difference, however, between the number and kind of such curbs needed to protect our liberties and the number and kind which infringe upon them is very slight. But it may still spell the difference between traditional American freedom and social and economic servitude.

We are talking a great deal about reconversion. Unfortunately, we are thinking of it too much in terms of real estate, tools and merchandise.

The reconversion that is needed most right now, is **moral reconversion**, a clearing away of the moral wreckage which surrounds our institutions, and which is as real an impediment to progress and a return to peacetime pursuits as is the rubble in the streets of London, Berlin, or Manila.

Make no mistake about it, we will regain our liberties only through deserving them. We can deserve them only by restoring some of the moral standards that have been allowed to languish.

This moral reconversion must be undertaken and accomplished through the instrumentality of the Church, the school, the press, the various business, labor, social, fraternal and political associations. But most particularly through the heartfelt and courageous determination of the individual. Without this moral reconversion, there is faint hope for the restoration of American liberties to American industry and to the American people.

Publicity for Engineers

AT A RECENT MEETING of the Structural Engineers Association of Northern California, it was pointed out that several large structures had recently been built in the West, or are currently under construction, the structural designs of which were perfected in the East, these buildings being for Western branches of eastern concerns. The engineers felt that the design should have been done in the West.

It was then pointed out that few people knew of their organization, the profession of structural engineering was not widely understood, and many owners failed to recognize the importance of careful structural analysis. From this came the demand for a publicity campaign, and this demand brings several thoughts to mind.

First, it was proposed to raise $1,000 to promote such a publicity campaign. For an extensive and worthwhile campaign, a thousand dollars is "mere peanuts." That sum would not even purchase one page of advertising in one of the larger national magazines. Twenty thousand dollars is considered a very minimum to conduct an advertising campaign, and firms who really wish national recognition never spend less than several hundreds of thousands of dollars annually. But even more important, merely raising and spending money will not accomplish results. The selling campaign must be directed. Who do the engineers wish to reach—eastern plant owners, western industrialists, architects, other engineers, the general public? Being a very specialized profession, they obviously have nothing to sell to the public as a whole, and a campaign spread broadcast would cost a terrific sum and achieve nothing.

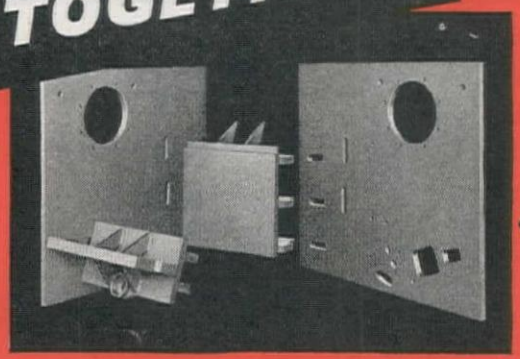
H. J. Brunnier, himself the outstanding example of his thesis, as one of the West's most successful structural engineers, pointed out one of the finest courses to be pursued, when he told the meeting: "As individuals, you must get out of your shell. Perform services for your community for which no remuneration is expected. Join and work in important organizations of the community. When you are well-known as an unselfish individual, your profession will likewise become known, and your rewards in the form of business will commence to flow in."

The columns of *Western Construction News*, and the same is true of other technical journals, are always open to articles on projects involving the work of the structural engineers, and due credit will be given them for their work. We are proud to carry, on page 83 of this issue, an article on a new school design worked out by one of the engineers of the group being discussed here. If enough money is raised, newspaper, radio or magazine advertising can easily be obtained. Direct mail campaigns for recognition can be carried out, but not one of these methods is as satisfactory as that outlined by Mr. Brunnier.

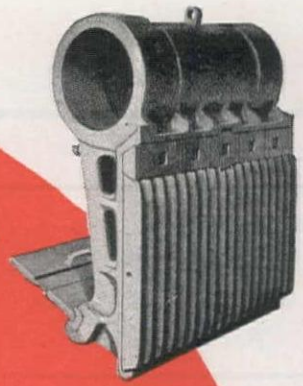
The engineer, or any other business man, for that matter, can not sit in his office, toy with his slide rule, and weep because business walks past the door, and architects are engaged to do structural designing. The individual can do, by active, forceful participation in outside activities, what no amount of paid advertising can accomplish.

Lastly, any selling campaign must be aggressive and straight-shooting. No eastern capitalist will be moved by pleas of sympathy to send his business to the West. He must be shown definite, positive reasons for superiority in this field of the Western engineer. These should be obvious: such things as familiarity with local building codes, foundation conditions, earthquake requirements, contractors, and labor markets. In each of these things the eastern engineer must start from scratch and make studies, with attendant increases in cost. Knowledge of local conditions will save many design costs, and may prevent building failure. Facts of this nature may be counted on to influence business, but complaining and feeling hurt never will.

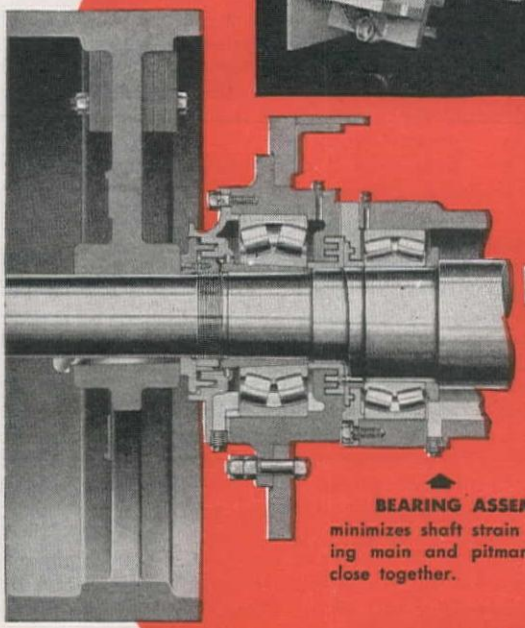
PUT THEM ALL TOGETHER



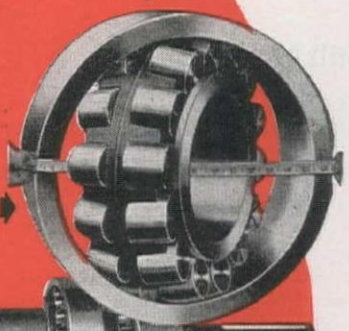
HEAVY PITMAN
is accurately bored to accomodate the precision eccentric bearings.



MAIN FRAME
of welded, high carbon steel plates, combines tremendous strength with light weight.



S.K.F. BEARINGS
of self-aligning type, protect load-bearing surfaces.

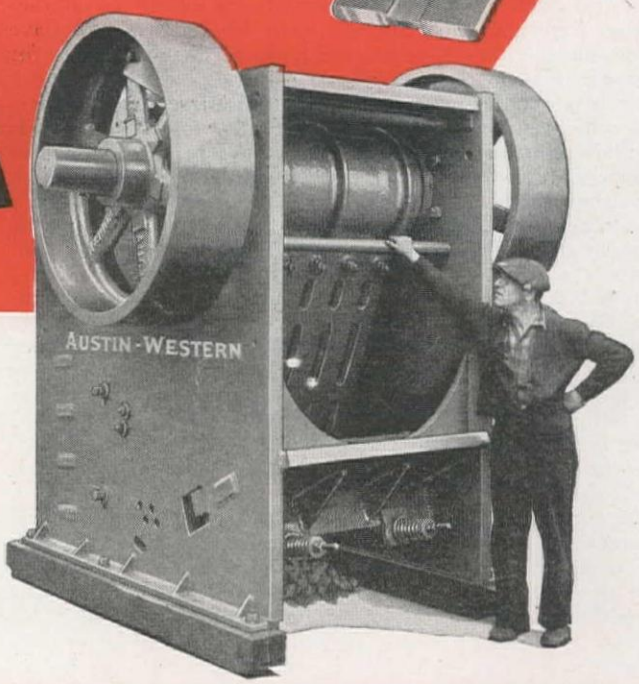


MAIN SHAFT
is forged, heat-treated, machined, ground, and polished.

BEARING ASSEMBLY
minimizes shaft strain by mounting main and pitman bearings close together.

STEEL TOGGLE
is of uniform width, and proper and uniform strength.

AND YOU GET MAXIMUM ALL-AROUND PERFORMANCE



• Pictured on this page are but a few of the many exclusive features of design and construction which are responsible for the ability of *Austin-Western High-Speed Jaw Crushers* to exceed ordinary output standards by wide margins.

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Shadow Mountain Dam

Third major unit of Colorado-Big Thompson project completed this month—Earthfill, rock-faced structure will store water for release into Adams continental divide tunnel—Dam and dike total 3,100 ft. in length, and main dam is protected by cutoff wall 27 ft. deep

By NELSON R. LOVE
Chief Engineer, Denver Tramway Corporation
Denver, Colorado

SHADOW MOUNTAIN DAM, part of the Colorado-Big Thompson irrigation and power project of the United States Bureau of Reclamation, is an earthfill, rock and cobble-faced dam located on the North Fork of the Colorado River, in the north central part of the State of Colorado. In addition to the actual design and construction of the dam and dikes, there are several interesting aspects of the dam as a key unit in the entire Colorado-Big Thompson project.

Located at an elevation of 8,375 ft., the dam will in effect provide an extension to Grand Lake, famous as a summer resort nestling in the high mountains on the western slope of the Continental Divide. The two lakes will be connected by a channel permitting passage of sailboats and motorboats, and Shadow Mountain Lake with an area of 1,356 ac. will enlarge the original area of Grand Lake from 507 ac. to a combined total of 1,863 ac. The water level will be held substantially constant.

The Colorado-Big Thompson project is unique in storing water on the western slope of the Continental Divide, pumping it to a higher elevation for passage to the eastern slope through the 13.1 mi. continental divide tunnel, officially named "Alva B. Adams Tunnel." The water then flows down the big Thompson Canyon on the eastern slope, generating far more than enough power for the pumping operation on the western slope, after which the water will be stored again for irrigation use in northeastern Colorado the following year.

In this way the generation of power is made completely independent of irrigation requirements as far as the season of the year is concerned, and a very high percentage of the power generated is firm power, that is, available for delivery as needed throughout the year. Pumping from Granby reservoir, which is the main west slope storage unit of the project on the Colorado river, to Shadow Mountain Lake will be done largely during off-peak hours which will further increase the percentage of firm power.

This phase of the operation of the project, which requires a considerable daily storage of water after pumping, at the level of the tunnel intake, provides for maximum utilization of the tunnel capacity, requires a minimum water storage in power plant forebays in Big Thompson Canyon, and is the fundamental reason why Shadow Mountain Dam, although comparatively small, is of vital importance to the successful operation of the entire project.

Dam maintains lake at constant level

Grand Lake is located on the western edge of Rocky Mountain National Park and has been developed as a popular summer resort for many years. The lake is surrounded by towering peaks covered with virgin forest on their lower slopes teeming with native wild-life. Being only a few hours' automobile ride from Denver, a city of some 400,000 metropolitan population, real estate values in Grand Lake Village and the surrounding area are relatively enormous, and it is evident that any serious disturbance of the lake level would detract greatly from the scenic beauty of the spot and be considered a great loss to the entire state as well as causing a specific loss to the property owners.

The inclusion of Grand Lake in the

project made a shortening of the tunnel possible and the increase in daily storage from Shadow Mountain Dam increases the percentage of firm power in accordance with daily variations in demand.

The tunnel intake is located at the easterly end of Grand Lake, discharge from the lake taking place over a weir with a maximum depth of one foot of water, so that the maximum lowering of the lake level is limited to one foot. Under normal operating conditions with a continuous flow of 550 cu. ft. per sec. through the tunnel and pumping largely during off-peak hours, the estimated daily change in lake level will be 0.2 ft., as against a seasonal change under purely natural conditions of approximately four feet.

Continental Divide diversion project

The Colorado-Big Thompson project is the most extensive trans-mountain diversion so far undertaken by the Bureau of Reclamation, although not the only diversion of water from the western side of the Continental Divide to the eastern slope.

The primary purpose of the Colorado-Big Thompson project is to supplement the irrigation water supply by 300,000 ac. ft. annually for 615,000 ac. of land now inadequately irrigated, in the South Platte River Valley in northeastern Colorado. In addition, the project will ultimately generate about 560,000,000 kw. hr. of salable electric energy annually over and above the requirements for pumping.

Water is scarce on the eastern slope, but a surplus exists on the western slope. All available supplies on the eastern slope have been fully developed. Under this project, water from the headwaters of the Colorado River will be stored in Granby reservoir with an active storage capacity of 468,000 ac. ft. The maximum elevation in this reservoir is 8,280 ft. and the minimum elevation 8,186 ft.

Water will be pumped from Granby reservoir to an elevation of 8,369 ft., flowing through a 4-mi. canal to Shadow Mountain Lake at an elevation of 8,367 ft. From this point the water flows by gravity through Grand Lake to the intake of the continental divide tunnel, through the tunnel 13.1 mi. to a conduit at elevation 8,242 ft. leading to Power Plant No. 1, in Big Thompson Canyon.

Water from the tunnel, flowing at a constant rate of 550 cu. ft. per sec. throughout the year except during a short period when the flow in the Big Thompson river is sufficient to operate the power plants, passes through four proposed power plants in succession to be again stored on the eastern slope at an approximate elevation of 5,275 ft., for irrigation use during the following year.

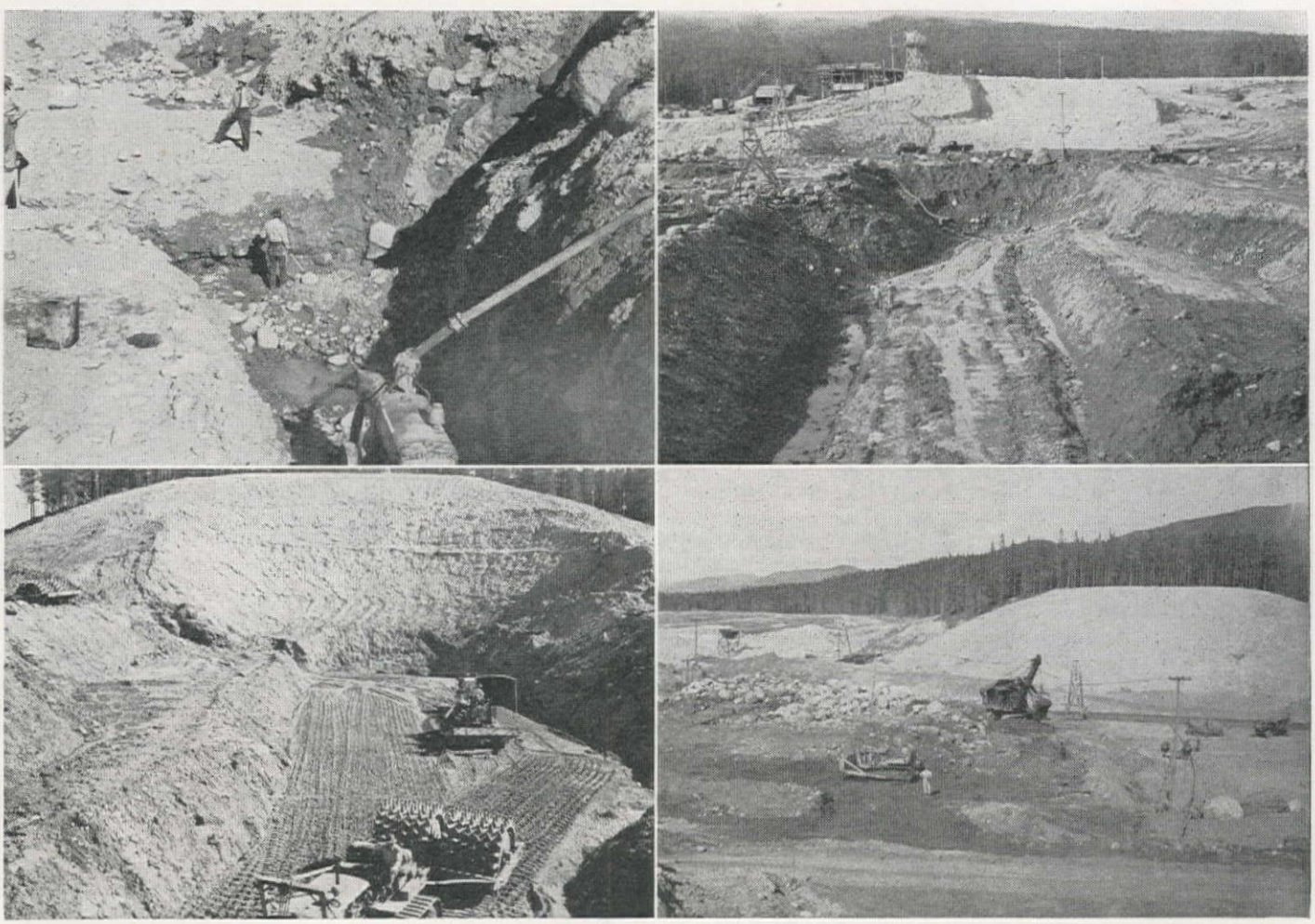
General description of Shadow Mountain dam

Shadow Mountain Dam is located in a gap cut by the North Fork of the Colorado River in an ancient terminal moraine, and it may be supposed that at one time a natural lake existed on the location of the proposed lake area. A considerable portion of the moraine lying west of the dam site was nearly at the elevation of the top of the dam, 8,375 ft., requiring construction of over 2,500 lin. ft. of dikes in addition to the dam proper. The entire length of dam and dikes, including two knolls which were leveled to the same elevation, is 3,100 ft. and is surmounted by a 30 ft. gravel-surfaced roadway.

Dam and dikes are earth-fill, faced with a three-foot thickness of rock riprap on a 3:1 slope on the upstream face, above elevation 8,360, and cobble-fill on the downstream face finished to a 2:1 slope above elevation 8,347, with flatter slope below extending to the ground surface. Riprap on the upstream slope is of uniform thickness.

The main dam has an impervious cut-off wall extending under its full length, approximately 27 ft. below the original ground surface. This does not extend under either spillway structure or dikes.

The reinforced concrete spillway structure is located at the westerly or right abutment of the dam structure. Discharge through the spillway to a maximum of 10,000 cu. ft. per sec. is regulated by two electrically-operated steel radial gates. Such discharge will be necessary only during spring and early summer when run-off in the North Fork and tributary streams exceeds the flow



SPILLWAY CUT-OFF TRENCH at left abutment. Upper left, draining during excavation; upper right, completed excavation; lower left, placing rolled embankment; lower right, general view of left abutment area ready for concrete.

through the tunnel. The chute section of the spillway widens to 70 ft. and discharges onto a 200-ft. radius vertical curve into a turbulent pool varying in depth depending on the rate of discharge.

All earth fill surrounding and beneath the spillway structure is drained by sewer pipe laid in gravel.

Materials

Most of the material excavated from the cut-off excavation and spillway location, consisting of sand, gravel, boulders and sandy clay was suitable for embankment and was stockpiled north of the dam site. Such material was screened to a maximum diameter of six inches prior to placing in embankment, and the oversize screened out used for cobble fill. Larger boulders, one cubic yard or more in volume, were broken by blasting for use in riprap. Riprap sizes ranged from one-half cu. ft. to one-half cu. yd.

Additional material for embankment, riprap or cobble-and-rock fill was secured from borrow pits so located as to become part of the pump canal from Granby reservoir to Shadow Mountain Dam. Waste material, such as stripping or material unsuitable for backfill or embankment, was spread on the lake bottom in such a way as not to appear unsightly or interfere with the spillway operation or functional use of the lake.

Cement, sand, gravel and concrete admixture material were furnished to the contractor by the government, cement and admixture material from a government warehouse at Granby, Colo., about 12 mi. from the dam site, and the sand and gravel from a screening plant upstream about two and one-half miles from the dam site.

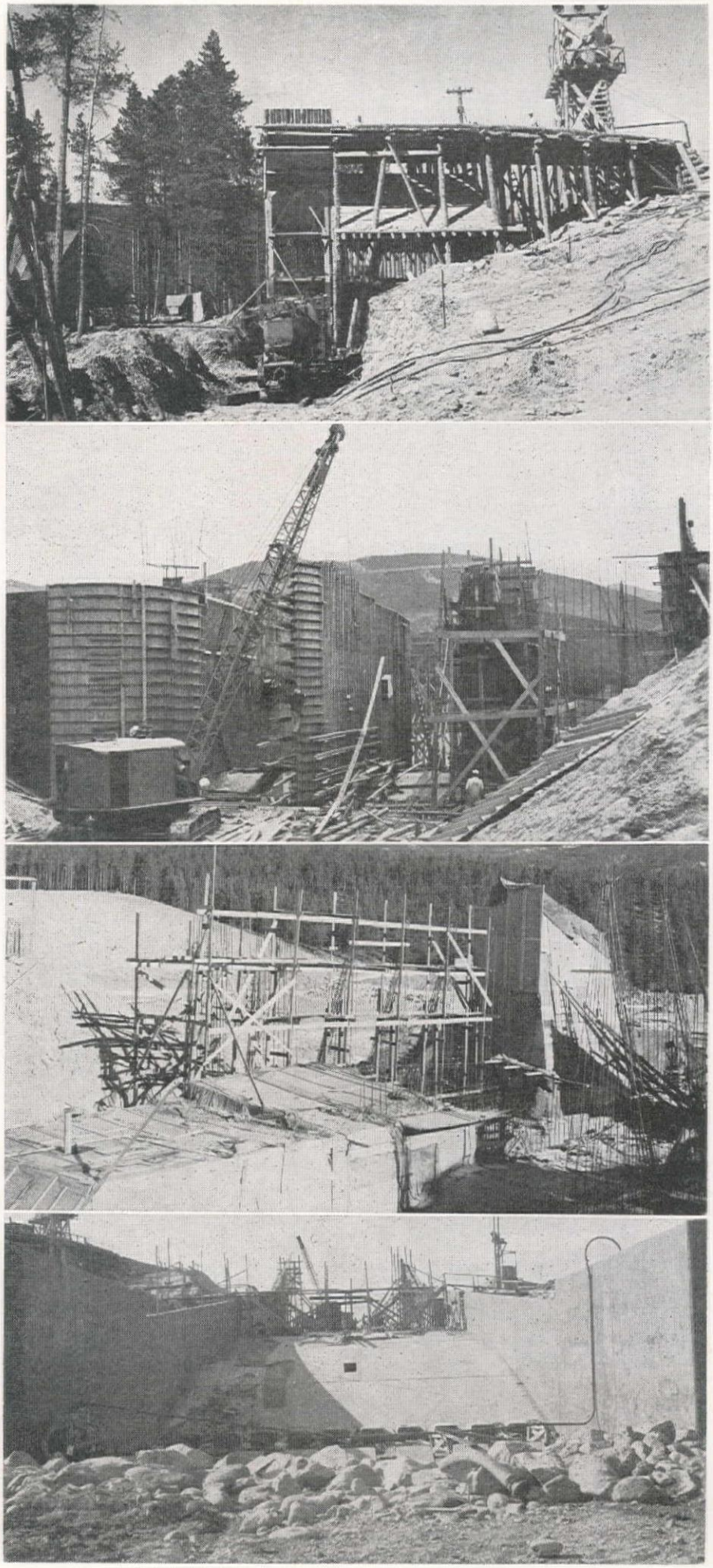
All other materials, such as steel reinforcing bars, radial gates, electrical equipment and other materials, and equipment other than that for embankment construction or concrete materials as mentioned above, were furnished by the government at Granby.

Timber for construction and fuel was secured from the area to be flooded, the contractor being required to burn all branches and brush. A stumpage height of not more than two feet was permitted.

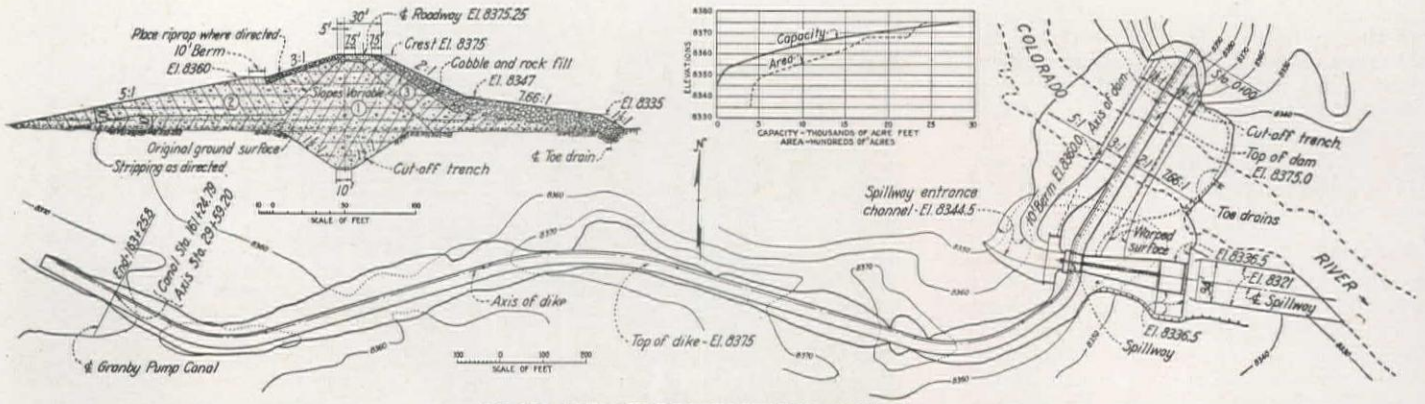
Equipment

Equipment provided by the contractor consisted of one 2½-cu. yd. electric shovel, one 1¼-cu. yd. shovel, one 1-cu. yd. dragline, also used to operate drop-hammer tamper; two tractors used as 'dozers and also for handling special compaction rollers; a motor crane; 3 and 5-cu. yd. dump trucks; electric drive grizzly loader for final processing and loading of material for embankment; portable electric loader; air compressors, arc welding machines and miscellaneous hand tools.

Two special sheepsfoot rollers for compaction of embankment were fur-



CONCRETE OPERATIONS at spillway. Top, contractor's mixing plant under construction. Next, spillway gate structure forms. Next, housing for winter curing of walls. Bottom, completed spillway apron.



PLAN AND CROSS SECTION of Shadow Mountain Dam and dike. Length of the dam is 3,100 ft. and a 30-ft roadway passes over it. Chart indicates sharp rise in capacity with increased depth.

nished by the government. These rollers were designed by the Bureau of Reclamation and were originally used by the Warner Construction Co. in the construction of Green Mountain Dam. The weight of each roller, when filled with sand and water ballast, is 42,000 lb.; drums are 5 ft. long by 5 ft. diameter, fitted with 120 tamper shanks with renewable heads 3 in. in diameter or 7.07 sq. in. in area. Total length of tamper shank and head is 10 in., making a total overall diameter of 6 ft. 8 in.

Compaction of backfill around the spillway structure where rollers could not be used was secured both by using concrete breaker guns with tamper foot, and by the use of a 1,750-lb. piledriver type drop hammer with tamper foot, operated by the dragline equipment.

The contractor's concrete mixing plant consisted of a three compartment aggregate bin with a total capacity of 80 cu. yd., with a single dial manually controlled weigh batcher mounted above a 2-cu. yd. mixer. This mixer discharged into a 3-cu. yd. remixer from which the concrete was discharged into an agitator located above a pumpcrete machine.

Power for electrically driven equipment was purchased from the government, supplied from wye connected transformers at 2300/4160 volts. This power was generated at Green Mountain power plant and sold to the contractor at one dollar per kw. per month on a thirty minute demand basis, plus an energy charge of 8 mills per kwh. for the first 50,000 kwh. per month, down to 4 mills per kwh. for power over 500,000 kwh. per month.

Embankment

Density of compacted embankment was satisfactory. Penetration resistance at optimum moisture content was 1,640 lb. per sq. in.

Control of moisture content in material for embankment held closely to the optimum figure, as the average moisture content of fill was 9.5 per cent as against the laboratory optimum of 9.7 per cent.

Material for the rolled fill was placed in 8 in. compacted lifts and compacted by 16 roller trips. Maximum diameter of rock allowed in fill was six inches.

Concrete

A total of 4,180 cu. yd. of concrete was poured for the spillway structure, using slightly different mixes for spillway floor and for other concrete. Concrete for the spillway floor was 1—2.35—3.26, water-cement ratio 0.485 by weight, maximum size of coarse aggregate 1 in., cement content 1.52 bbl., or 6.08 sacks per cu. yd. Twenty-eight day strength from 15 cylinders broken was 6,400 lb. per sq. in.

Other concrete was 1—2.34—3.16, water-cement ratio 0.49 by weight, maximum size of coarse aggregate 1 in., cement content 1.54 bbl. or 6.16 sacks per cu. yd. Twenty-eight day strength from 27 cylinders broken was 6,450 lb. per sq. in.

An admixture of "Darex" for air entrainment was used in some of the concrete which will be exposed to weather in order to minimize checking and spalling from freezing weather conditions, which are apt to be very severe at the altitude of 8,375 ft.

Concrete was poured as late as December 8, 1944, and in order to maintain sufficiently high temperatures during placing and curing, a temporary enclosure of rough lumber and saturated felt was used, this structure being heated by wood fires.

Forms were required for all exposed surfaces having slopes flatter than 1:1. Where formed surfaces are to be permanently exposed to view or to the action of flowing water, use of absorptive form lining was required.

Progress

Actual construction started May 3, 1944, clearing and stripping dike and dam locations. Placing of the dike embankment started May 30, 1944, and excavation for the left abutment cut-off trench started the following day.

Excavation for the spillway was also started May 31, 1944, and carried on concurrently with excavation of the left abutment cut-off trench. Materials from spillway and cut-off trench excavations were used partly for dike embankment construction and the balance was stockpiled for use in rolled embankment of the main dam. Spillway excavation was completed in July and concrete placement started immediately thereafter, finishing placement of spillway wells and floors Dec. 8, 1944.

Many of the larger boulders were removed from the excavated material as it was stockpiled, but further processing was necessary before placing in the embankment. This was done with an electrically driven grizzly loader. Material was removed from the stockpile with the electric shovel and dumped into the loader hopper, thence passing through grizzly bars spaced with 6-in. clearance and loaded into dump trucks and dumpsters for transport to the embankment.

Dike embankment is still continuing, but the left abutment cut-off trench excavation was completed on Aug. 19, 1944. Stripping borrow pits started Aug. 21, 1944, to supply material for the rolled fill of the cut-off trenches. The left abutment cut-off trench was filled and river diverted Oct. 12, 1944.

During the summer of 1944 a long diversion dike was constructed upstream from the dam site for the purpose of diverting the river flow through the spillway during the construction of the dam proper. A gap was left in this temporary dike for the flow of the river in its original channel, to be closed when spillway would be ready for operation.

Work was resumed May 1, 1945, continuing with the construction of spillway walls and placing of spillway steel gates, and construction of the spillway inlet. The spillway gates were set in place Aug. 29, and the gap in the diversion dike was closed the morning of Aug. 30.

Placing rolled embankment was again started Aug. 16, 1945, on the right half of the dam, and continued on the entire dam as soon as the river was diverted through the spillway. It is anticipated that completion of the entire structure will take place in December, 1945.

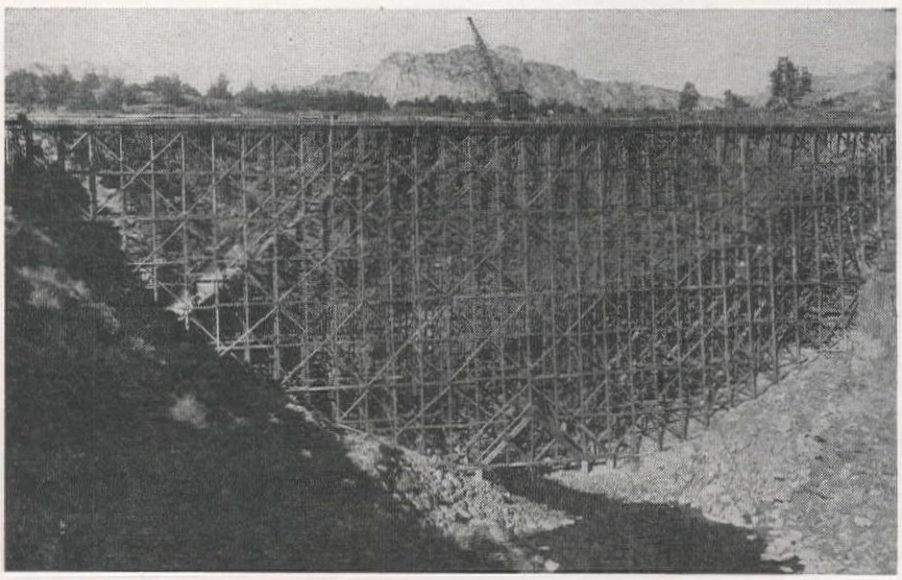
Organization

The contract was awarded to J. F. Shea Co., Inc., of Los Angeles, to be completed on or before Dec. 31, 1945. Superintendents for the contractor were: Wm. F. Rennebaum, April, 1944, to Oct., 1944; Edmund Shea, Oct., 1944, to May, 1945; Charles Kavanaugh, May, 1945, to date. Les Still was in charge of carpenter work and Wm. Reyner in charge of field earthwork.

For the Bureau of Reclamation, C. H. Howell, Project Engineer at Estes Park, Colo., was in general charge of all construction. G. R. Highley, Resident Engineer on the Western Slope, was in direct charge of construction; and R. P. Blackwell, Field Engineer, was principal assistant to the Resident Engineer; with B. E. Carrothers handling field inspection and laboratory work.

Deschutes Project—
Features Unusual Flume and Tunnels

Water impounded behind Wickiup Dam will irrigate some 50,000 acres of central Oregon land never before watered — Present construction on the project includes outlet works at Wickiup, canals, tunnels, and a flume crossing of a 140-ft. deep canyon—Much interesting equipment devised to meet war shortages



TEMPORARY TRESTLE will support the forms for a modified concrete arch 140 ft. high which is to carry an inclosed flume and superimposed roadway crossing Crooked River. The footing and initial forms for left leg of the arch are shown and preliminary work to establish the right footing is under way.

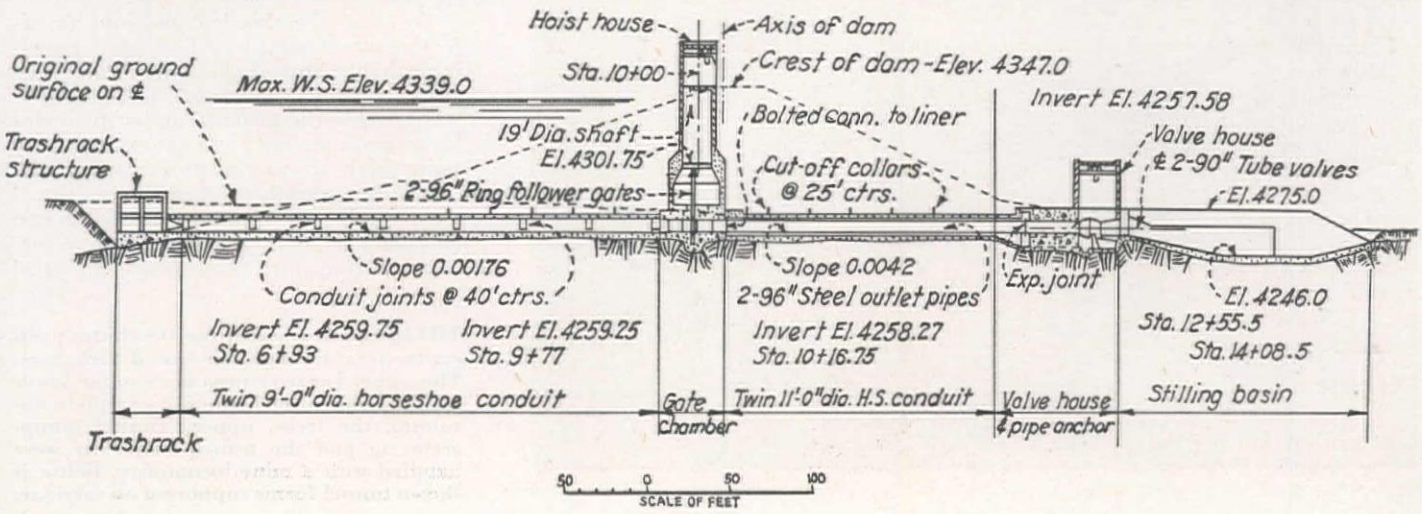
By F. W. SLATTERY
Field Engineer
and
C. C. BEAM
Hydrographic Engineer, Bureau of Reclamation
Bend, Oregon

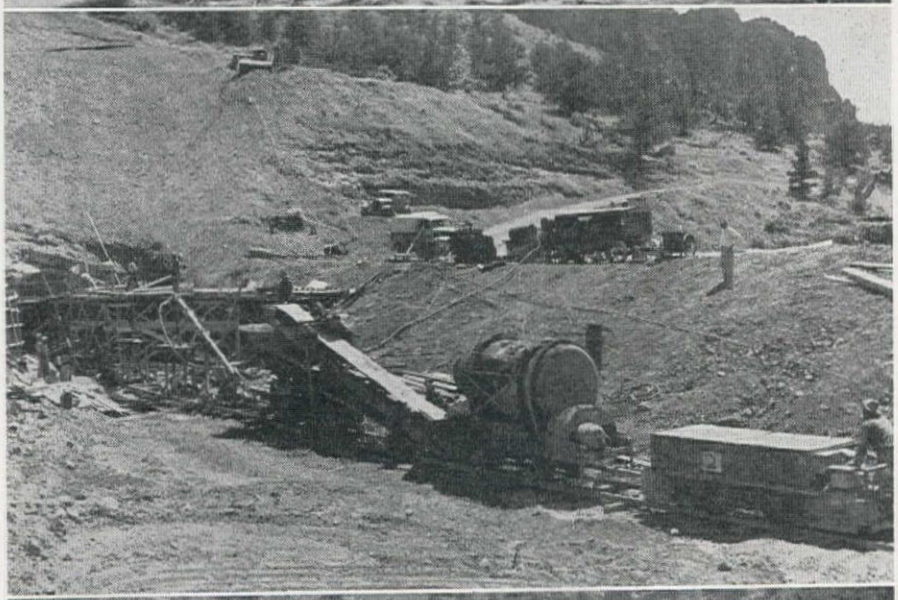
OREGON "DRY FARM" lands will be watered by the Deschutes Project, situated in Central Oregon, east of the Cascade Range. Under this development facilities are being constructed by the Bureau of Reclamation to irrigate 50,000 ac. of land within the Jefferson Water Conservancy District, near Madras, Oregon, and to provide supplemental water for approximately 47,000 ac. of land within established irrigation districts in the vicinity of the cities of Bend and Redmond. The Conservancy District lands, termed the North Unit of the project, have been previously dry farmed but never irrigated.

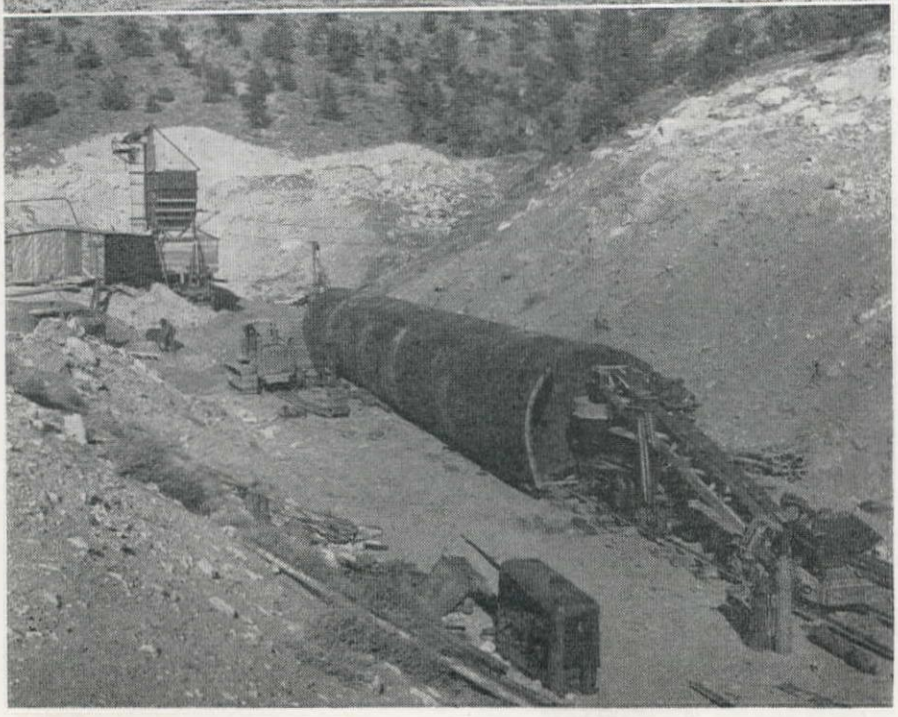
Water for the North Unit will be stored behind Wickiup Dam, 43 mi. southwest of Bend, and will be allowed to flow through the Deschutes River to the city of Bend where it will be diverted into a main canal, 65 mi. long, having a capacity of 1,000 cu. ft. per sec. Supplemental water for the established districts is stored in Crane Prairie Reservoir, upstream from Wickiup, behind a dam which the Bureau of Reclamation has reconstructed.

North Unit construction was declared feasible by the President in 1938. The finding of feasibility for the construction was based on an estimated cost of $8,000,000, of which $2,000,000 was to be provided through Civilian Conservation Corps (CCC) activities, operating on non-reimbursable funds. Construction of facilities to provide the supplemental water supply was estimated to cost $400,000. As a result of the abolishment of the Civilian Conservation Corps in 1942 and the acceleration of construction under wartime conditions to aid the war food program, the estimated North Unit cost increased to $9,500,000, the reimbursable part of which is repayable by the water users over a 40-year period following completion.

SECTION THROUGH WICKIUP DAM outlet and valve house showing the relationship of these features and the stilling basin to the earth-filled structure. The dam and dike include approximately 55,000 cu. yd. of earth fill and rock protection work.







Wickiup dam

Wickiup Dam is an earth-fill structure, 90 ft. high above the stream channel and 14,100 ft. long. An additional East Dike, 25 ft. high and 3,400 ft. long, must be constructed across a saddle, situated about a quarter mile south and east of the dam site. The dam and dike have a top width of 30 ft. with a 3:1 upstream and 2:1 downstream slope. The upstream slope has a rock-fill surface as protection against water and wind erosion, and the downstream slope is riprapped for the same purpose. The outlet structure consists of two 9-ft. diameter conduits, situated at approximate river level, with a trash rack protecting each inlet. Each conduit has a ring follower (emergency) slide gate, situated at the upstream crest of the dam, and a tube (regulatory) valve, situated in a valve house at the outlet end. A broad rock spillway will be built at the north end of the east dike. The outlet works were constructed by C. J. Montag & Sons, contractors, of Portland, Oregon, during 1939 and 1940.

CCC crews began construction work at the dam in 1939. They first cleared the site of all trees, removed approximately 3 ft. of top soil, and then began placing embankment. Previously, in 1938, they had begun the difficult task of clearing a thick growth of jackpine timber from the 10,200-ac. reservoir area. Work on both these operations continued during the summer months of each year until 1942 when the CCC was disbanded. It was estimated that work on the dam and reservoir at that time was 30 and 43 per cent complete, respectively. The work of reservoir clearing has since been advanced on a limited scale by a small Civilian Public Service Camp of conscientious objectors.

Reservoir clearing

With only a limited number of men available, it was necessary to adopt machine methods in clearing. Use of ordinary bulldozers was found to be slow because the root systems on the jackpine trees are spread close to the ground surface and when the dozers pushed against the trees, the roots came up under the dozer blade, making it necessary for the machine to back up to get under the roots to complete removal. Thus, each tree required two movements of the dozer.

To eliminate this lost motion, an effective attachment was developed, which is probably best explained by reference to the accompanying photo. In the forward action the protruding bar provides leverage in pushing against the tree at a point high above the roots. It tips the tree over ahead of the conventional dozer blade so that the machine can complete removal of the tree in one forward motion. Two tractors are equipped

TREEDOZER used on the Deschutes project to clear the reservoir site of jackpines. The upper bar overturns trees so the lower teeth on the dozer blade can complete uprooting the trees, upper. Tunnel pumpcrete rig and the transit batch car were handled with a mine locomotive. Below is shown tunnel forms supported on carriage.

with this unique device. Three bulldozers, equipped with tree-piling teeth, are used to windrow the trees. The piling tractors operate in pairs, moving several of the uprooted trees at a time.

Canals and headworks

Construction on the 1,000-cu. ft. per sec. main canal was undertaken by the CCC late in 1938. This work was done during the winter months when adverse climatic conditions, including deep snow, prevented operations on the dam. Two 1½-cu. yd. draglines, Bureau-owned and operated, aided the CCC in its work on the canal. By 1942, when the CCC was terminated, 29 mi. of the canal had been practically completed and another 3 mi. were complete except for rock excavation.

The headworks of the main canal and the first 2 mi. of canal were constructed, under contract, by Sam Orino, Portland, Oregon, during 1941 and early 1942. A rather unusual part of the headworks, not installed until 1945, is the fish screen. Diversion of 1,000 cu. ft. per sec. from the river would remove more than 50 per cent of the total flow of the stream at this point, and if the canal were not suitably screened, many of the game fish would be lost. They would enter the canal during the irrigation season and die when the water was turned off in the fall.

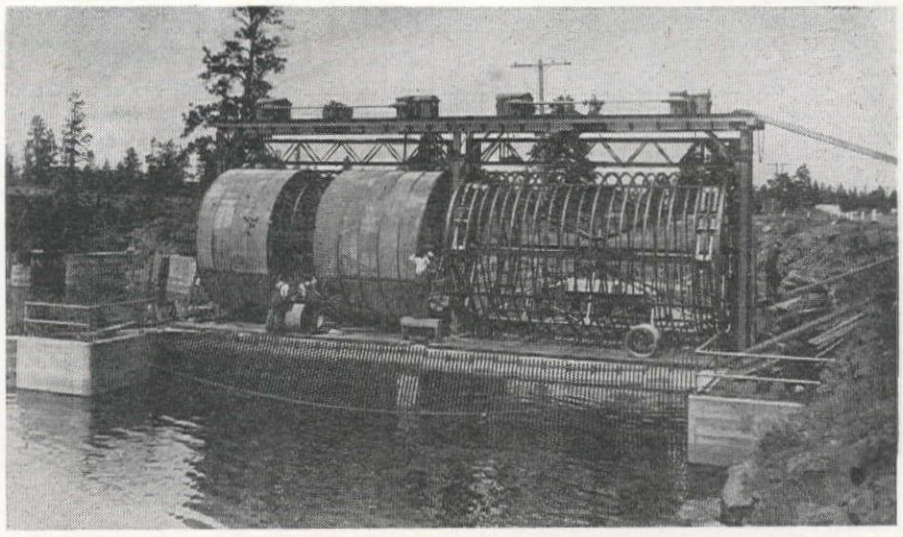
The protective equipment consists of two revolving screens, each 24 ft. long and almost 15 ft. in diameter, rotated by individual electric motors. As the wheel rotates, the screen surface collects moss from the upstream side and lifts it over the top. When this surface is submerged on the downstream side the flow of water flushes and cleans it. The screen is one-quarter inch mesh, steel, spacer cloth. Flexible rubber seals are provided at the sides and bottom to prevent fish from escaping into the canal through these areas. Each screen and frame can be raised out of the water for periodic cleaning and repair by electrically operated hoists, mounted on a superstructure. Although this type of screen has been used before, it is doubtful if one as large and well engineered has ever been built.

During most of 1943, project work was practically at a standstill because of a War Production Board order diverting critical materials to other wartime uses. On Sept. 14, 1943, construction on the project was approved under the War Food program to the extent necessary to irrigate 20,000 of the 50,000 ac. in the North Unit.

When building of the dam had been sufficiently advanced to permit the required storage of water, the project engineering force concentrated on the location and design of the distribution system so that construction contracts could be let at an early date.

Tunnel construction

One of the major features of project construction recently completed is the tunnel work. It involved the driving, lining, and placing of transitions for two tunnels, one 3,443 ft. long, and the other 3,361 ft. in length. This contract was awarded to Wixson and Crowe of Redding, Calif., on March 25, 1944.



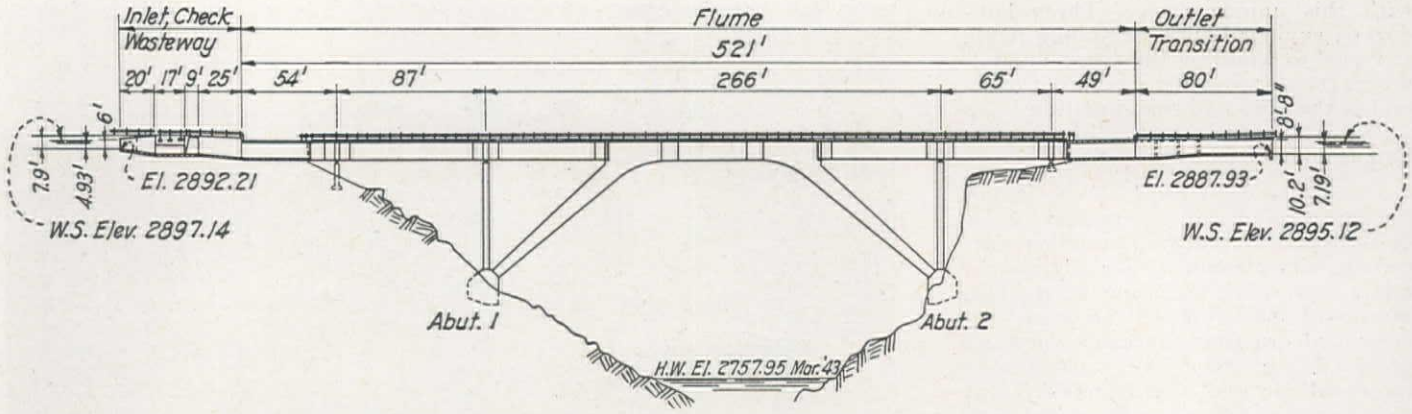
ONE OF THE LARGEST circular fish screens ever built was installed at the intake of Deschutes canal to prevent game fish being lost in the irrigation system. Both sections of the screen are equipped with electric driven hoists and power rotation mechanism which facilitates the maintenance and cleaning of screen and machinery.

Both tunnels are horseshoe-shaped, with 11 ft. 3 in. finished diameters, and have a constant slope of .002. They are designed to carry 1,000 cu. ft. of water per sec. at a water depth of 9.23 ft. The lining is unreinforced concrete, having a minimum thickness of 5 in. The contractor started preparations for construction work on April 1, 1944.

The material through which the tunnels were driven is largely volcanic tuff, according to the Bureau of Reclamation's Regional Geologist C. J. Okeson. It is cut by faults and shear planes and varies in hardness from one bed to another. The rock was of such texture that, in general, it drilled well. No timbering was necessary except in one place in tunnel No. 2 and two areas in tunnel No. 1. In tunnel No. 2 timber was used for a distance of 160 ft. because the bedding planes were badly shattered. No water was encountered in this tunnel, however. In tunnel No. 1 timber was required in only two short sections, one 30 ft. long, and another 20 ft. long. These covered areas of a badly broken intrusion of moderately hard volcanic tuff. The rock was very unstable due partly to the presence of a small amount of free water.

In driving the tunnels the contractor used interesting departures from standard practice in combination with usually accepted methods. These innovations were necessary principally because the contractor could not readily obtain equipment and common labor. The first 600 to 800 ft. of tunnel were drilled from a jumbo, mounted on a 2-ton Ford truck chassis. The equipment was backed into the tunnel for drilling and removed during loading and shooting. The mucking-

TRACTOR SCRAPER used in the portal sections of the tunnels to power muck rock back from the face to enable a bulldozer to clear the round from the tunnel. Operation of this scraper is effected with the usual cable power control unit.



ENCLOSED FLUME carries canal across Crooked River on reinforced concrete modified arch structure, 140 ft. high. Provision is made for a roadway over flume.

out was accomplished by moving to the tunnel face a tractor on the back of which a heavy winch-operated hoe (called a cowdozer) was mounted. This hoe pulled the muck forward to a point where a bulldozer could get to it and push the muck out of the tunnel with its blade. This equipment was efficient for the initial 600 ft. of tunnel.

The balance of the driving was done by standard track-mounted jumbo and an electrically-driven Conway mucking machine, operating on a narrow-gauge track, which loaded regular mine-type dump cars. The track-supported jumbo and tractor equipment was used to open up all four portals. The mucker and track-mounted equipment worked from the inlet portal of tunnel No. 2 until it holed through into the portion previously driven by tractor equipment. At tunnel No. 1 the track-mounted equipment worked upstream until it joined the portion driven by tractor methods from the inlet portal.

Another departure from the usual practice was utilized by the contractor in the trimming of side walls and ceiling. He used heavy chisels, mounted on framework replacing the dozer blade on a tractor. While the tuff was hard enough to stand with a minimum of timbering, its texture was such that it could be shaved by forcing a very hard, sharp chisel into it by the forward movement of the tractor. The position of the chisel was controlled by raising and lowering the special arms which replaced the bulldozer arms. The chisel for side-wall work was about 4 in. wide, with the point beveled entirely on one side to make the point bite into the tuff. The chisel used for ceiling work was similarly mounted. However, its point was only 2 in. wide and was used to trim projecting points rather than to shave a smooth surface.

Tunnel lining

The concrete lining was placed by pouring the invert or floor sections from dump trucks backed into the tunnel from a mixing plant outside. The walls and ceilings were placed from rail-mounted pumpcrete equipment using sectional steel forms. An average of 100 lin. ft. of walls and ceiling per day was placed. Forms were moved forward once each day.

The portals and transitions were placed after the inside concrete work had been finished. The last concrete was placed on July 21, 1945, and the tunnels are now ready for service.

Another major feature of the Deschutes Project is the Crooked River Crossing now being constructed by David A. Richardson of Santa Cruz, California. The 1,000 cu. ft. per sec. of water in the main canal will be carried across the 140-ft. deep Crooked River Canyon in an enclosed flume, supported by a concrete modified arch. The footing and terminal 25 ft. of the arch leg is solid concrete, while the upper 66 ft. of the leg is divided into four hollow sections averaging 16 ft. in length. The walls of the hollow section are 15 in. thick, and these sections are connected by manways, 3 ft. in diameter, through the bulkheads. A roadway will be provided on top of the flume. At present the falsework required to support the forms for the arch and flume has been erected and the contractor is starting on the form work and concrete.

Storage of water in Wickiup reservoir deprived the Pacific Power & Light Company of water power for its existing plants and necessitated adding a generator at their Cove power plant on the Crooked River. A contract for the construction of a third plant was awarded to C. J. Montag and Sons of Portland, Oregon, who are expected to complete the installation by the end of the year.

Additional contracts

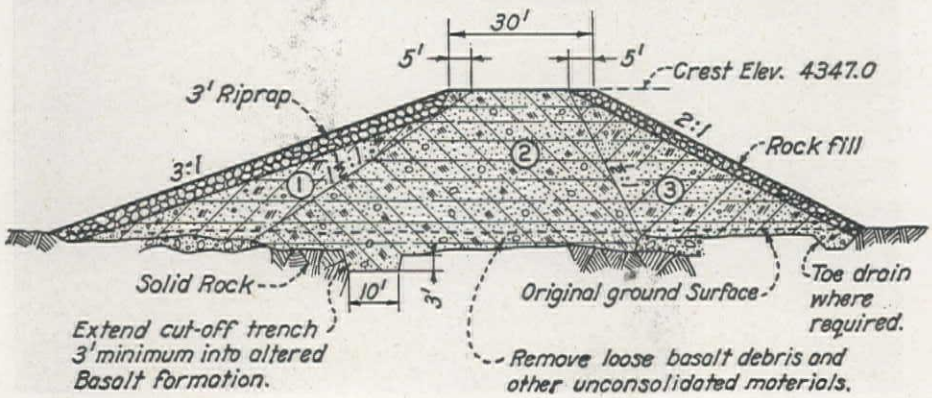
The following additional contracts have been awarded since approval for accelerated construction was granted. These contracts cover most of the work necessary to provide irrigation water to the first 20,000 ac.:

McLaughlin Construction Co., Pocatello, Idaho, low head concrete siphon—a railroad underpass and two highway bridges over the main canal (completed); H. I. Hamilton, Eugene, Ore., miscellaneous county road bridges, etc., on main canal (completed); E. B. Bishop, Orland, Calif., construction of 14 mi. of main canal, a part of which construction had already been accomplished by Bureau forces (McLaughlin Construction Co. is building the structures for Bishop); United Construction Co., Seattle, Wash., lateral M-37 system; Blickle & Cater, Portland, Ore., lateral M-41 system; United Construction Co., Seattle, Wash., laterals M-30, M-31, M-32, and M-34; W. C. Thompson, San Francisco, Calif., lateral M-43 system.

The Bureau of Reclamation organization as it applies to the Deschutes Project is as follows:

Harry W. Bashore, Commissioner, Washington, D. C.; Walker R. Young, Chief Engineer, Denver, Colo.; F. A. Banks, Regional Director, and Robert J. Newell, Associate Regional Director, Boise, Idaho. In the Deschutes project office at Bend, Ore., C. H. Spencer is Construction Engineer, F. M. Spencer is Administrative Assistant, and F. W. Slattery is Field Engineer. Others on the project are F. E. Goehring, Office Engineer; A. R. Barbour, Chief of Surveys; L. R. Brooks, Chief Inspector; and C. C. Beam, Engineer in charge of Hydrography, River Improvement, Investigations and Safety.

CROSS SECTION of Wickiup dam, showing heavy fill. Material in zones 1 and 3 is sand and gravel with sufficient brown soil for binder. Zone 2 is clay or lake bed material mixed with sand and gravel, in proportion not to increase percolation rate.



Timber-Steel Combined in School Building Design

Selected for its economical features by a Palo Alto, California, school district, this unique design combines steel columns and timber beams and bracing members to form an earthquake and fire resistant structure of unusual durability

THE CONSTRUCTION of the Willow school in Ravenswood School District, north of Palo Alto, Calif., is a welcome relief from astronomic war contract figures. In this new elementary school building, Architect, Engineer, and Contractor have combined to produce a building of pleasing appearance and designed to give unusual utility and economy. The structure just completed is the second unit of the Willow school, each unit of which provides four class rooms and the auxiliary service rooms. Class rooms are arranged in a straight line so that each room has access to both play yards, and also provides rapid exit ways in case of emergency.

The building is located with its long axis orientated approximately east and west at the intersection of Willow Road and Beacon Street. With this arrangement ample north light is provided through the extensive use of glass in the north wall and control of the south light with a corridor roof which runs the full length of the south exposure. The corridor will eventually be glassed in to give the children additional protected space during stormy weather. Exterior walls are finished in cement stucco and the trim is painted white.

Design

Each school unit is arranged as a series of four contiguous rooms measuring 23 by 40 ft., which offers the least distraction from class room work by noise or movement in other parts of the building, and material design is simplified by this rectangular shape.

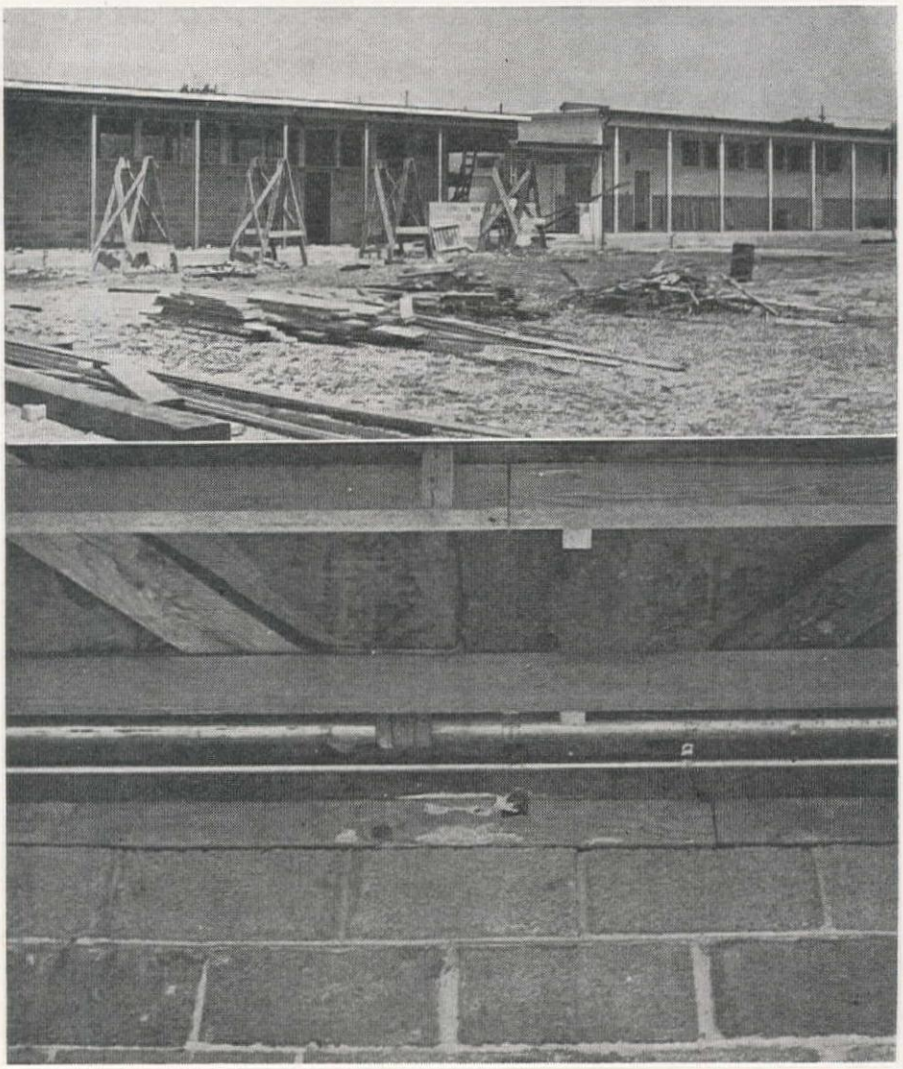
The frame design is a post and beam type with some unique timber bracing employed to give the structure excellent earthquake resistance. Reinforced concrete footings support columns of 4 by 4-in. wide flange, 10.5-lb. steel H-sections. Plates welded to the top of these columns form the attachment and support for 6 by 16-in. timber beams which span the building.

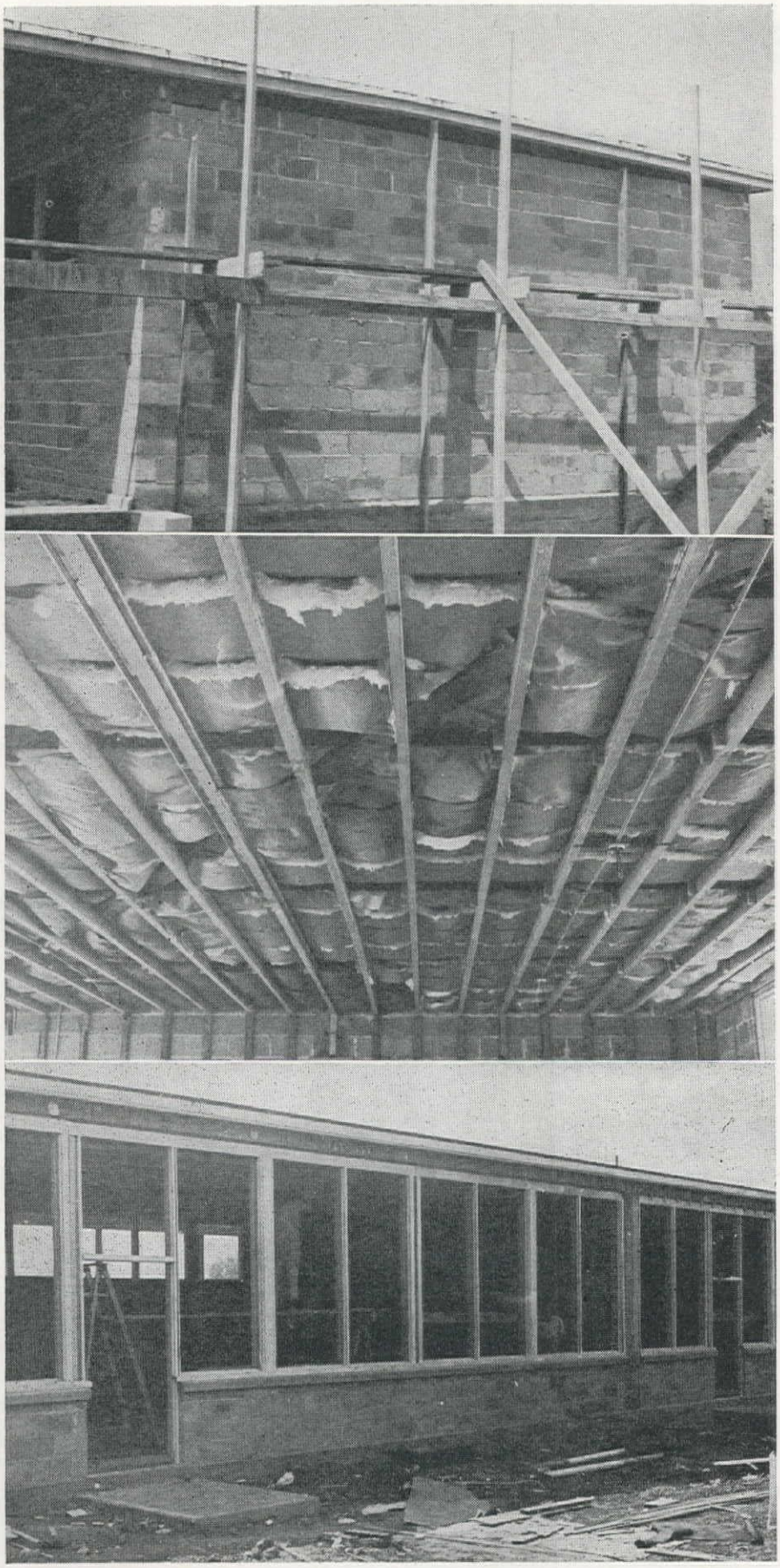
The columns are placed 8 ft. C-to-C, three to a bent. One H-section supports each end of the timber beams and the third column supports the beam at the wall between the class rooms and the 10-ft. corridor traversing the south side of the building. Transverse walls between class rooms and outside wall, except for sash and door space, are filled with hollow concrete tile.

The walls are reinforced with 2⅜-in. bars in alternate cells, grouted solid, and spaced as required to communicate building stresses and earthquake stresses to the concrete footings. Reinforced concrete slab floors are doweled to the footing and rest on a 6-in. fill of compact crushed rock overlain by one inch of rolled sand. The floor sands are 4 in. thick, reinforced with 6 by 6-in. No. 10 steel wire mesh.

Rigidity of frame is provided by the use of 2 x 6-in. diagonal timber braces which are dapped into the lower side of the 6 x 16-in. beams and secured to each beam with ⅝ x 7-in. lag screws. Additional stiffeners are provided by placing another 2 x 6-in. timber vertically on the center of the horizontal member to form a T-section. From the juncture point on the inside wall two short braces traverse the corridor from the junction to the ends of two adjacent beams. The main diagonal brace runs from the outside corner to the inside wall of the first room, thence from the inside corner of the second to the outside wall, and so on

WILLOW SCHOOL unit No. 1 complete, right, and No. 2 under construction shows the south exposure with high windows protected from direct sunlight by the corridor roof, upper. Timber beams and braces as they appear before the ceiling is enclosed.





END WALL OF WILLOW SCHOOL during construction showing the heavy 6 x 16 in. beams trimmed to form the roof pitch, upper. View of a room ceiling with the diagonal brace running from the corridor wall to the exterior north wall, center. Extensive use of sash in the north wall will provide ample light for classrooms. Arthur D. Janssen, architect, and Isadore Thompson, engineer, designed the school.

through the building to create an earthquake resistant structure.

The top of the beams are sloped by adzing from the center toward both ends to provide a drainage pitch and covered with 2 x 8-in. T. & G. sheeting providing the base for a felt, asphalt and gravel roof.

Combining in the structural design of this building the rigid support of steel columns and the flexibility of timber beams and bracing there is developed a building with good fire and earthquake resistance together with economy in construction and exceptional durability.

In this specific case the outside dimensions of the school are 182 ft. 10¼ in. by 35 ft. 6½ in., or approximately 6,490 sq. ft., which divided into the contract price of $37,640 gives the favorable unit price of $5.80 per sq. ft. of floor space for this type of construction.

Inside finish and fixtures

The interior of the building is finished in keene cement plaster painted with washable oil enamels. Practically 90 per cent of the north wall is finished in sash to provide an abundance of north light for the study room. The lower row of sash is glazed with reeded diffused glass to prevent outside activities distracting the children's attention. Direct glare from the south and west is minimized by a single row of sash located at the top of the south wall and protected from the direct sun by the corridor roof. Additional control is provided for these windows by venetian blinds.

Furniture for the children in the primary rooms is a colorful set of miniature chairs and tables. Cabinets for the storage of supplies and for cloak rooms are all finished in light natural wood, situated near the rear of the room. Ample blackboard and tack board space is provided on the east, south and west walls of the room. Floors are covered with light colored patterns of asphaltic tile, which is easy to keep clean and also absorbs a large amount of floor noise. An insulation of rock wool was placed above the ceiling to improve acoustics and reduce heat losses.

Individual control of lighting, ventilating and heating is provided for each room in the design. Each room is equipped with six 500-watt semi-indirect light units covered with a white glass bowl. Provision has been made to include in the lighting circuit, as soon as they are available in the market, a photo-electric light control unit. This new photo-electric control is designed to turn on the electric light circuit whenever the natural light source falls below 15 foot candles at the desk level. With this device in the electric circuit the children are automatically protected from eye strain due to insufficient light at the working area. The photo-electric cell or eye is arranged to scan the outside light source and at the same time not be affected by the artificial lights when they are in use.

The rooms all have an individual class control buzzer, fire alarm and electric clock. In addition each room can be connected to a public address system, which may be used by the school administra-

tion to speak to the students or to play recordings. It may also be used to select programs of educational interest from any radio network.

Heating and ventilation is provided by gas-fired hot-air heaters located at the back of each room. Cool air is picked up near the floor and when needed warm air is circulated toward the front of the room. Both the heating element and the circulating fan are thermostatically controlled.

Personnel

Arthur D. Janssen, A.I.A., Atherton, Calif., developed the architectural design of the Willow school, and Isadore Thompson, structural engineer, San Francisco, is responsible for the structural design of the buildings. E. W. Wismer, electrical engineer, designed the control, lighting and communication systems for G. M. Richards and Associates, who were responsible for all electrical and mechanical design.

The general contractor is DeLuca and Sons, San Francisco, represented by Tom Ellingson as superintendent and Vincent Maffei as construction foreman.

Suggest Use of Public Funds To Balance National Economy

WHEN CONSTRUCTION falls below a figure approximately 12 per cent of our national income, depression threatens, Charles M. Upham, engineer-director of the American Road Builders' Association, told a conference on postwar planning in Washington recently. He recommended that a stabilizing board representing all construction agencies be set up which by controlling public investment will maintain this figure as a minimum. His address, in part, follows:

"We find many proofs of the high-powered influence of construction in our national economy. It is significant that in times of prosperity we have a relatively large construction program—above 12 per cent of our national income—and in times of depression we have a low construction program considerably below 12 per cent.

"While there is general agreement on the necessity for a large construction program to keep us prosperous and advancing, there is some difference of opinion as to the size of the program that should be carried on. The exact size can be estimated from past experience, and there are other barometers that will determine the size more exactly as we approach the time when we have sufficient employment to maintain a buying power that will keep business active.

"This total construction program is made up of two major parts—private investments which include housing, industries, railroads and other enterprise financed with private capital—and public investment which includes construction which is paid for by taxation derived from all levels of government. Highways and streets come under this category

"Generally in prosperous times the total construction program is made up of approximately two-thirds from private investments and one-third from public investments. It is difficult to control private investments. This rate of investment is influenced by many things. It is controlled by the individual or private groups swayed by the enthusiasm of the times, tax laws, buying power, availability of funds, rates of interest and other forces. On the other hand, public investments can be controlled as has been shown in recent years. Public investments can be maintained at a high level, or they may be deferred as the highway program has been deferred during the war period.

"Since it is difficult to control private investments and relatively simple to control public investments, then it is quite evident that in order to maintain a total construction program of a certain size, the part to be varied is that of public investments. In those years when private investments are relatively high, public investments over and above the required minimum should be deferred. In those years when private investments are low, then public investments should be made to bring up the total construction program to approximately 12 per cent of our national income. In this manner the construction program can be stabilized at the required minimum.

"Congress should set up a stabilizing board. It should have representatives of all the construction agencies of the federal and state governments that would furnish information for the activity of such a board, yet the direction of this board could be with the Federal Works Agency."

September Traffic Reaches All Time High After Release of War Controls

MOTOR VEHICLE TRAFFIC on rural highways in the United States in September jumped 37 per cent above that in September, 1944, according to reports of state highway departments to the Public Roads Administration. In the Rocky Mountain and Pacific Coast area motor vehicle travel reached an all-time high for September, exceeding the previous September peak in 1941 by 8 per cent and that for September, 1944, by 54 per cent.

For the country as a whole the recovery from the low wartime level was surprisingly rapid. Rural traffic climbed to within 14 per cent of the all-time September high in 1941. Normally, August is the month of greatest travel, but this year, because of removal of war controls, September traffic was 107 per cent of that in August.

The figures are based on data from 573 automatic traffic recorders located outside of cities in 43 states. Most of the counters were on state highways, and traffic on these highways was 43 per cent greater than in the same month of 1944.

Howard C. Wood, principal bridge engineer of the San Francisco-Oakland Bay Bridge, reports that for September, automobile traffic over that structure reached a total of 1,774,556 vehicles, an increase of 554,000 over the same month of 1944. The maximum use of the bridge was made on Sept. 30, when 76,247 automobiles used it, and the lowest day was Sept. 2, when 66,269 vehicles traversed the span. Total toll collections for the month were $591,924.

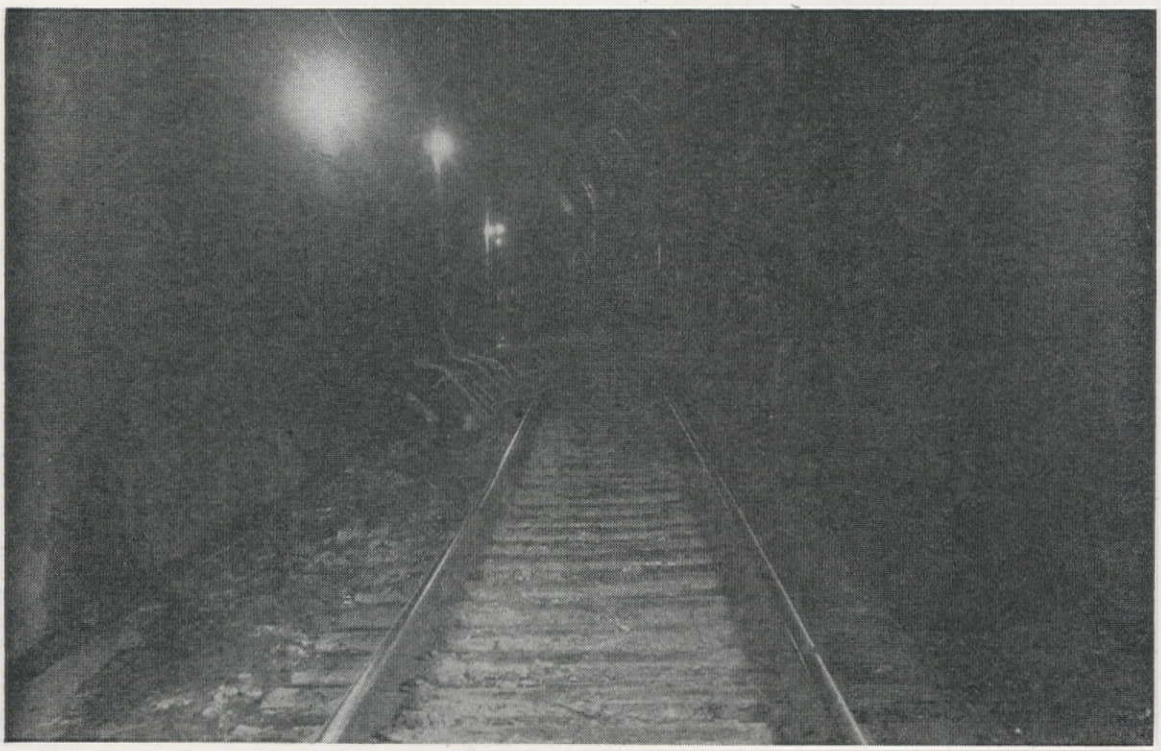
Inasmuch as the span was designed for a traffic load of approximately 81,000 cars per day, agitation is shaping up for a new bay crossing. The heavy load of traffic at the present time is frequently slowed up by accidents and blowouts of over-age cars and tires, and is often jammed to an almost complete standstill in all three lanes in each direction.

Even if, during rush hours, some of the automobile traffic were to be diverted to the truck lanes on the lower deck, only an inconsequential, lightening of the load would be effected, inasmuch as the lower deck is also operating near to capacity with trucks and buses.

Federal Land Holdings Equal Area of 7 States

A RECENT SURVEY of federal land holdings within the territory of the United States showed that various government agencies owned by the end of 1943 615,532 sq. mi. Federal holdings consist of part of the original public domain and of additional property not part of the domain acquired at various times since. To June, 1940, the acreage thus held equalled 576,275 sq. mi., or an area about equal to the total land surface in the states of Washington, Oregon, Idaho, Montana, Wyoming and Utah combined. Between 1940 and 1943 additional acreage acquired was 39,257 sq. mi., practically the area of the State of Virginia. All such federally held land is free from the payment of state and local taxes, except in certain instances where "in lieu" payments are provided.

Grout Soft Roadbed in Tunnel



A SERIOUS CONDITION prevailed here when soft spots started to develop in the roadbed and clayey material oozed up through the ballast. The clay liquefied and flowed into the drainage ditches, retarding the passage of water.

For many years soggy roadbed in the Fort Wright tunnel of the S. P. & S. Railroad, near Spokane, Wash., slowed trains down to 10 m.p.h.—Grouting restored operating speed to normal and markedly reduced the need for track repairs—A grout pump applied the mix into pipes along the tracks

A RAILROAD TUNNEL, which for forty years has slowed up trains of the Spokane, Portland & Seattle Railroad and materially increased the difficulties of operation because of waterlogged, unstable foundations, has been restored to full operation through application of a newly developed railroad roadbed grouting system.

The tunnel is the Fort Wright bore, located a few miles west of Spokane, Wash. It is 2,134 ft. long, the greater portion of it being on a 3 deg. curve with an ascending grade westerly of 0.88 per cent. Construction of the tunnel was started in March, 1909, and the lining of the tunnel and portals was completed in 1910.

Long history

Investigation of the records shows that trouble was encountered from the very first, not only in the driving and lining of the tunnel, but all through the subsequent years of train operation. Materials encountered consisted of quicksand, clay and rotten rock, which slacked very badly when exposed to open air. Also, considerable water was encountered during the driving. Although concrete lined throughout, the tunnel was not floored.

As a result, soft spots commenced to develop in the roadbed and bulges of clayey material and quicksand oozed up through the ballast with the passage of every train. While it is probable that the soft spots are in reality nothing more than perched water pockets, the passage of trains caused the clay to liquefy in these pockets and squeeze out through the ballast shoulders with an upward and outward force. It frequently rose as high, or higher than the top of the rails and emerged along the tunnel walls in such quantity as to form clay dikes and dams, which in turn retarded the flow of water through the drainage ditches, thus intensifying the already serious condition. At times the water would even cover the ties, and at one location what was substantially a spring emerged from the crib of the track.

Throughout the years this soft roadbed condition required the constant attention of section forces to dig out the clayey material, restore the drainage ditches to operating condition, and replace voids with new ballast. It was not at all unusual for section crews to surface and line a portion of the track and then be required to repeat the operation within a matter of days. A "slow order," limiting train speed to 10 m.p.h., had been in force on this tunnel since the soft spots first developed and it was a particularly unsatisfactory arrangement, inasmuch as the tunnel was at the bottom of a severe grade and satisfactory train operation required a higher speed for impetus on this grade.

Track grouting investigated

Engineers of the railroad last year investigated the track grouting systems developed by the Pennsylvania Railroad, the Atchison, Topeka & Santa Fe and other railroads, in conjunction with the Portland Cement Association, with a view to determining whether this treatment would be satisfactory for the Fort Wright tunnel, and in January of this year the application of the corrective treatment was started under the direction of E. B. Stanton, maintenance of way engineer of the line.

The grouting system worked out and described by the Portland Cement Association is a specific application of the usual grouting practice. The injection points are driven through the ballast and foundation rock into, or very close to the streak of liquefied material underlying the track. Should the point be driven through this material and into underlying clay, it becomes necessary to withdraw the point partially, for the grout

cannot be forced into the clay. The points are driven at the outward end of the ties at such an angle as to bring the tip approximately underneath the rail. In some instances the points are driven between the rails, but this is not particularly practicable since they must be driven to such a depth as to clear all passing trains.

It is essential that work begin at one end of a project and move progressively forward through the soft area. As the work advances, it has been found valuable in some cases to inject pure water through the forward points in order to wash clay from the ballast stone and to lubricate a passageway for the grout. In addition, the water flowing through the ballast and foundation rock may create channels through which the cement will pass more freely.

Track grouting procedure

It is seldom necessary to take special precautions to control the upper limit of the injected grout, since the top ballast generally contains enough fine material to prevent grout penetrating except for occasional chimneys or porous areas. In cases where numerous break-throughs occur it has been found advantageous to cease grouting at that point until the injected material has stiffened, thereby forming a crust. After this has occurred grouting may be resumed in the lower portions of the pocket.

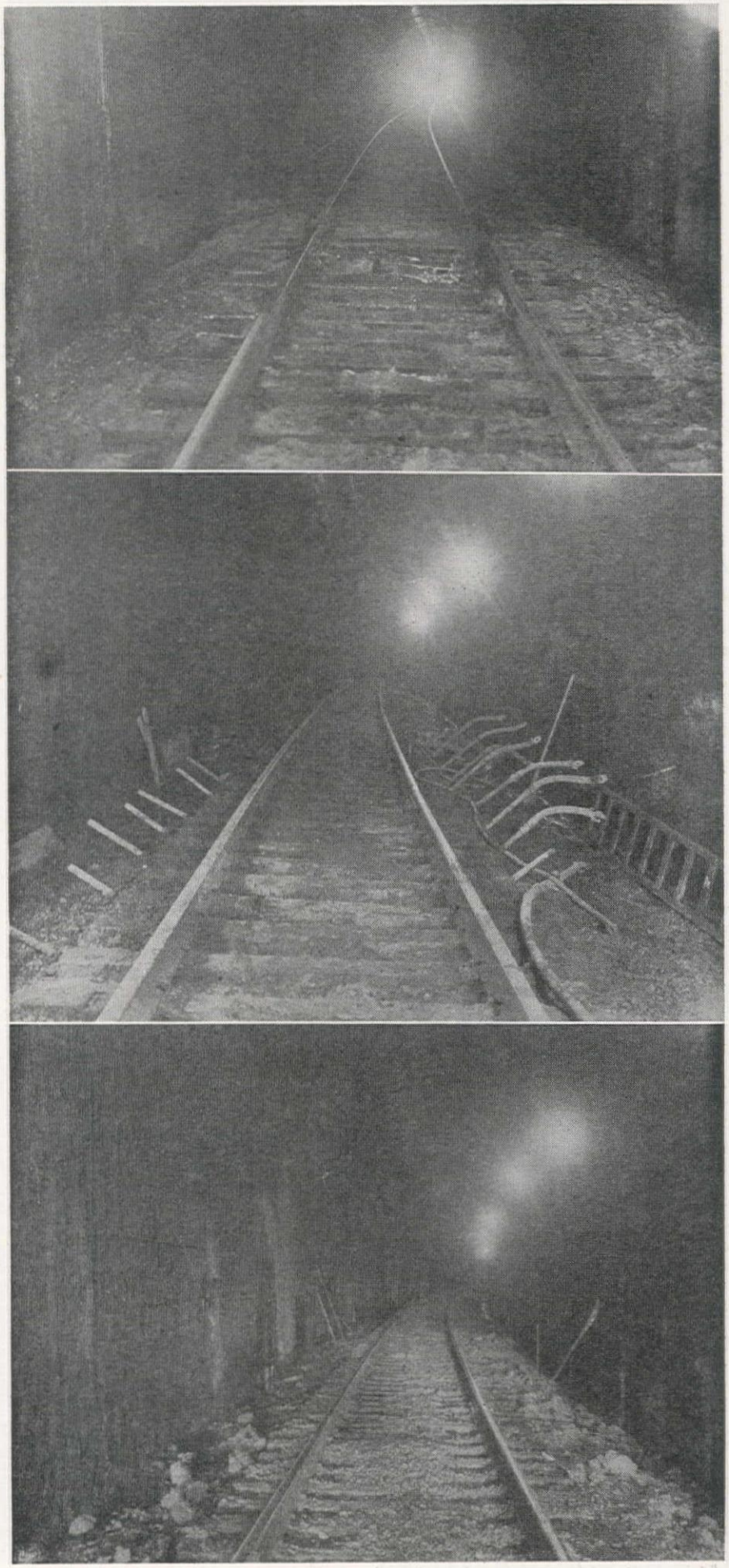
Grout injection is continued at each point so long as the grout is accepted, provided there are no break-throughs which waste cement, or the track is not heaved objectionably. As refusal occurs near the bottom of the pocket being filled, the grout points are raised progressively until injections are accepted higher in the ballast. After grouting through each point, the point is either removed or plugged so that the grout will not be forced out by the pressure and compaction of passing trains. If it is prevented from wasting in this manner the pressure of the trains will afford wider distribution of the grout.

After the grouting is completed and has been permitted to set, the rails are brought to the final line and surface, and train operation may proceed without interference.

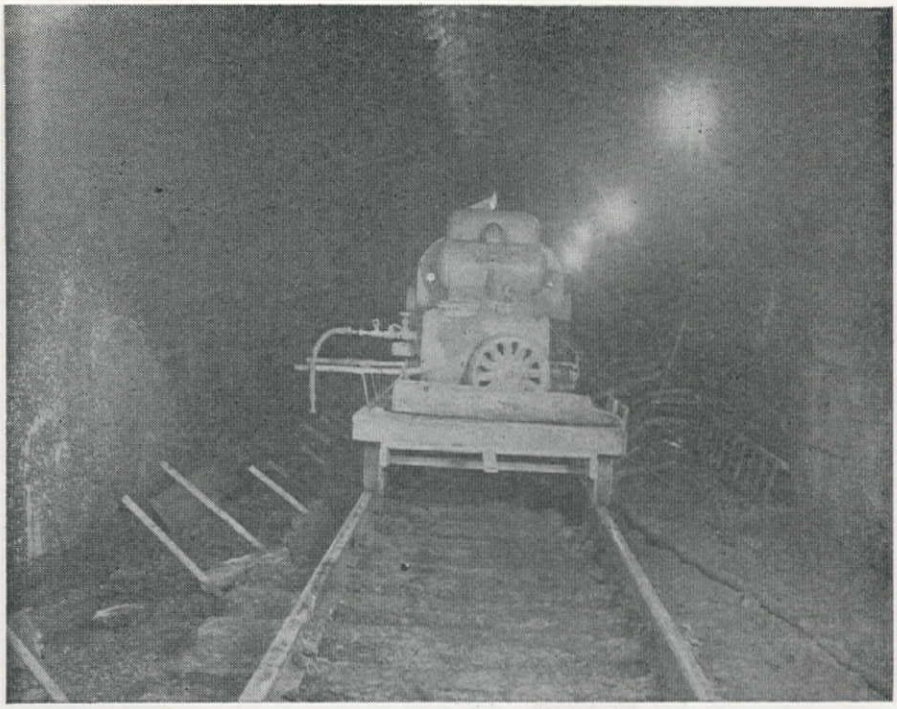
Entire tunnel grouted

In the case of the Fort Wright tunnel, the track was grouted from the west portal throughout its full length and for 200 ft. beyond the east portal, a total distance of 2,350 ft. When the operation was first started, injection pipes were driven at every fifth tie, but conditions were found to be so bad that it was necessary to change to more frequent grout holes, and throughout most of the work, pipes were injected at every second tie.

Holes for the injection pipes were first



BEFORE GROUTING (top), roadbed was soft and waterlogged. White spots in foreground indicate mud bubbles. During grouting (center), pipes were placed at every second tie. Few days after grouting (bottom), bed has dried out, leaving chunks of mud instead of bubbles. Track is then aligned for normal use by trains.



GROUT PUMP of ¼ cu. yd. capacity, mounted on push car, pumped grout at a pressure of 90 lb. per sq. in. One batch was average amount used for every two pipes.

made by driving a solid steel rod into the ballast until it came up against a hard clay sub-base, at which point the rod was withdrawn and the injection point inserted in the hole. This was inserted to within 4 or 6 in. of the clay. It was found that pipes would plug if driven and left too long before pumping. Due to the frequent train movements and other delays, it was found inadvisable to try for continuance of operation, that is successive driving of holes, insertion of points and pumping of grout. The system finally arrived at was to drive fifty injection points during the forenoon and pump the cement into them in the afternoon. Because of the plugging no injection points were left in over night. Average progress under this arrangement was about 80 track ft. per day.

Aggregate used for the grouting was common blow sand which would pass a No. 14 screen, and cement. Preliminary experiments showed, however, that the sand had a tendency to settle and separate from the cement and a small quantity of diatomaceous earth was added to correct this separation. It was also found that this addition provided a more workable and easier flowing grout. The most satisfactory mix, and that used throughout most of the work, proved to be 6 parts cement, 3 parts sand, 1 part diatomaceous earth, and 10 parts water. Batches on this basis were mixed in a ¼ cu. yd. mixer, this size being adopted because the grout pump was able to handle a charge of that capacity.

Injecting the grout

The quantity of grout pumped into each injection pipe varied widely, from a maximum of 5 of the ¼-yd. batches in one pipe, to a minimum of one batch being distributed over four or five pipes. The average for the entire job based on total quantity of material used was one batch for every two pipes, or, in other words, an average injection of ⅛ cu. yd. per injection point.

The application of the grout was made under an air pressure of approximately 90 lbs. per sq. in. When higher pressures were experimented with, they resulted in line blocks and blowouts through the ballast without getting any greater amount of grout in the roadbed. In some cases, using the 90-lb. pressure, the grout came out of pipes 15 and 20 ft. away from the point of injection. At a number of locations clear, cold water was forced out from beneath the track and as the work progressed it was found so successful in choking off water seepages that it became difficult to secure sufficient water for the grout.

The operation was completed in seventy days, being carried out by maintenance forces of the railroad. After the cement work was completed and permitted adequately to set, dry mud and foul ballast was removed and the track was brought to proper alignment and grade. Since that time there has been no recurrence of the softening of the roadbed and the 10-mi. slow order has been removed, thus permitting trains to use the track in the tunnel at normal speed for the first time in nearly forty years. It is believed that the track will continue to hold its alignment equally as well as any other firm roadbed.

Equipment used in the work was as follows: 1 air compressor; 1 pressure tank; 50 injection pipes, 4 and 6½ ft. in length, with driving collar and easily detachable couplings; 2 driving caps; 1 jackhammer; 1 heavy duty motor car; 3 heavy duty push cars; 1 cement mixer; air lines, water barrels, pipe puller, etc.

N. S. Westergard, S. P. & S. road master at Pasco, was in direct charge of the work in the field.

Arizona-California Pipeline Proposed

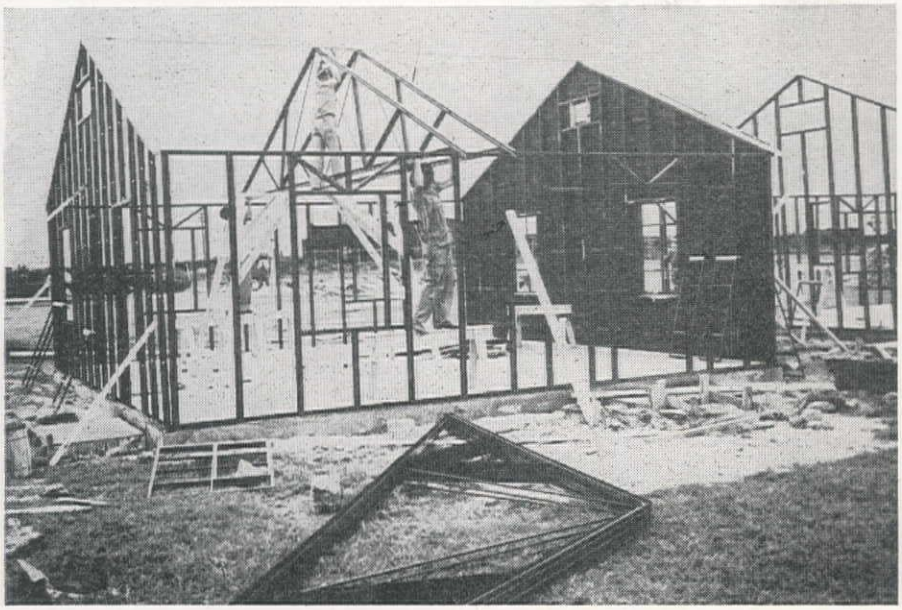
THE FEDERAL POWER COMMISSION has received a joint application filed by Southern California Gas Co. and Southern Counties Gas Co. of California, with principal offices in Los Angeles, for permission to construct and operate a 214-mi. 26-in. natural gas pipeline between a point on the Arizona-California boundary near Blythe, Calif., and Santa Fe Springs near Los Angeles. At Blythe the proposed line would connect with another pipeline, which the El Paso Natural Gas Co. proposes to construct from the Hugoton and Panhandle gas fields in Texas and various fields in the Permian Basin area in Texas and New Mexico. At Santa Fe Springs it would connect with a 26-in. line extending to Los Angeles, which latter line is now in course of construction by the applicants.

The estimated capital cost of the proposed initial pipeline and facilities, which would have a daily capacity of 175 million cu. ft. of gas per day during the first five years of operation, is $12,140,000. Estimated cost of additional compressor plant facilities, to bring the project up to its maximum ultimate capacity of 305 million cu. ft. of gas per day during the succeeding 25 years, is $3,000,000. Applicants propose to finance the cost out of funds currently available, Southern California Gas Co. to pay for 75 per cent of the cost and Southern Counties Gas Co. to pay the remaining 25 per cent.

The application states that all of the oil and gas fields from which the applicants are receiving their current supply of natural gas are being rapidly depleted, and during the winter of 1944-1945 were not capable of producing amounts sufficient to meet the maximum day's requirements of the communities served. The situation was met in the winter of 1944-1945 by curtailing deliveries to industries and by drawing on stored gas. "It is expected that within a few years the production of natural gas from California fields will be wholly inadequate to meet the requirements of applicants, and that during the next 30 years a large portion of the entire requirements of the applicants for natural gas will be supplied by the proposed system," the application says.

It is intended to begin actual construction not later than Oct. 1, 1946, and to complete the construction by June 1, 1947, subject, of course, to receiving appropriate authority from the FPC and from the California Railroad Commission and subject to El Paso Natural Gas Co. receiving a certificate for its Texas to California line. Its application for authority to construct a 26-in. pipeline from a point near Jal, N. Mex., and extending west about 720 mi. to the Colorado River east of Blythe, was filed with the Federal Power Commission in August. Total cost of the project is estimated at $25,440,000 and capacity is estimated at an ultimate daily capacity of 305 million cu. ft.

Nailable Steel Speeds Construction



Nailable steel, which was used in the construction of Quonset Huts during the war, is available for light industrial and residential building — It is claimed to have fire resistance, strength and durability and can be used simply and easily

THE QUONSET HUT, quickly erected, and widely useful structure devised during the war and employed all over the world by the U. S. Navy, has become a well-known building type. Nailable steel, employed in the framing of these structures, is now available for use in residential and light industrial construction, according to the Stran-Steel Division of the Great Lakes Steel Corp. of Detroit, Mich., which organization manufactured the Quonsets.

The manufacturers assert that the lightweight steel framing system can be erected with the simplicity and economy of conventional materials, while still retaining all the exclusive qualities of steel.

Outline of the system

The main members of the system are the joists and studs, which both incorporate the new system for nailing sheathing and other collateral materials to the rigid frame. In these members, two plates of relatively thin gauge steel are deformed and placed together in such fashion as to leave a groove of approximately the same width as a nail.

As nails are driven through the sheathing into these grooves, it is deformed by being forced by the blows of the hammer to curve around the curved deformations in the steel plates, and is thus clinched into place, so that a holding power in excess of that secured by driving into a wood member is obtained.

The members are pre-fabricated by the manufacturers, so that little cutting and fitting at the job site is required. Rapid erection of the steel frame allows other crafts to start their work early, bricklayers, concrete men, plumbers, electricians and others proceeding with their part of the building while sheathing is being applied.

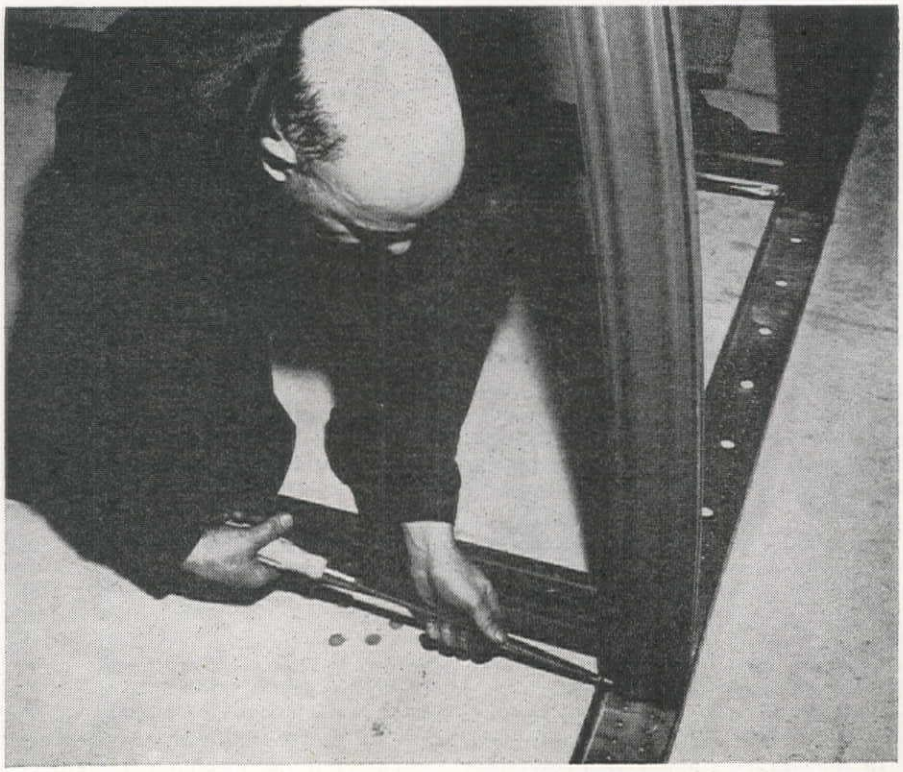
Standard specifications

The standard studs manufactured of this nailable steel are 3⅝ in. in depth and have a 2-in. flange on each side, composed of a 1-in. wing on each side of the central groove. These members are used for framing exterior walls and interior bearing walls, as well as for ceiling joists and roof rafters.

A narrow stud 2 5/16 in. in depth, with similar 2-in. flanges is also fabricated for lighter walls, ceilings, etc., and for furring around ducts, pipes and other openings where nailing of collateral materials is required. Half studs, 1 11/16 in. deep, with the 2-in. flange on one side only, are adapted for nailing where structural strength is not a requirement.

For floor joists, members from 6 to 9 in. deep are manufactured. These also have the 2-in. flanges on both top and bottom, but only one sheet of metal is made the full 8 in. in depth, the nailing groove being formed by adding deformed angles with a 1-in. wing to form half the flange and extending along the web of the joint only far enough to give adequate gripping on the nail. Three

ERECTION OF STEEL FRAME is shown at top. Steel used in the framework has a decided advantage over wood in that it does not warp or shrink. Such structures are expected to be used for farm, industrial and aviation building. Picture at bottom shows how floor joists are joined to studs by the use of ordinary carpenter tools.

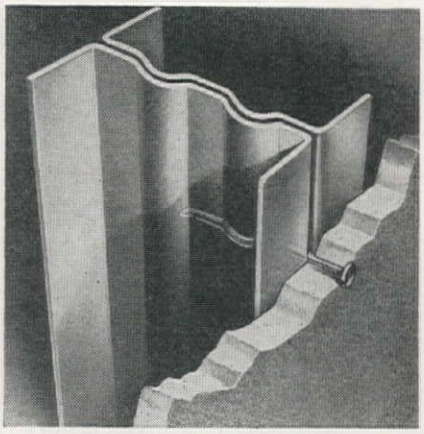


joists can be used on spans up to 20 ft. in length.

Plates for top and bottom wall plates, sills, head members for window and door openings are also provided, coming in two dimensions. One is 3 13/16 in. wide, with 1⅝-in. flanges; the other is 2½ in. wide, with similar flanges. Holes are punched in the flanges at 1-in. intervals for bolted stud connections and in the web at 6-in. intervals for anchor bolts.

The company has its own suggested line of lath and other collateral materials, but these are not absolutely essential to successful operation of the nailable steel scheme.

Although originally devised for use in the Quonset hut, the framing scheme can be used now on buildings of any shape and plan. A summary of claimed benefits include uniform quality with elimination of warping and shrinking faults, strength, durability and fire resistance.



TWO THIN GAUGE steel plates are curved, leaving a groove that is the width of the nail. As the nail is forced between the sheets it is deformed and clinched fast, giving a greater holding power than can be obtained by driving nails into wooden structural members.

New Mathematical Calculator Solves Complicated Engineering Equations

A "MECHANICAL BRAIN" capable of solving in a few days mathematical problems which would take several years of work by conventional methods has been purchased from General Electric Co. by the University of California for installation on the Los Angeles campus, it has been announced by Dean L. M. K. Boelter of the College of Engineering.

Sixth instrument of its kind in the entire United States, the new differential analyzer was purchased with funds provided by the State Legislature for the purpose of establishing a modern and complete department of engineering on the Los Angeles campus. It will be one of the most important pieces of equipment to be housed in the engineering laboratories to be erected soon.

With its many different combinations of gears and couplings, the "brain" can produce answers to problems so complex that their solution would never be undertaken by ordinary mathematical means. For instance, Lockheed Aircraft used it in a study of the stress imposed in landing the Constellation and other large airships. During the war, engineers have applied the machine to such technical developments as those of radar.

Although the instrument will be housed on the Los Angeles campus, Dean Boelter pointed out that it will be available to all California for the solution of industrial and scientific problems, such as those involved in heat transfer, electrical circuits and engine vibration.

Consisting of an interconnected system of shafts, motors and gears, the machine employs mechanical elements for addition, subtraction, multiplication and division, and electro-mechanical elements for more complex functions. Practically all of the gears and couplings are removable and are set up in a different arangement for each new problem.

In appearance, the analyzer resembles a long maze of shafts and gears with input tables extending to one side. When the machine is in use, the variables in the differential equations being solved are represented by the rotation of shafts in the machine. These are connected with mechanical pens on the output tables. As the shafts speed ahead to solve the equation, they move the pens, which, in turn, plot an accurate curve in accordance with the quantities worked out by the continuous movements of the shafts. Interpreted correctly, this curve gives a graphic solution of the problem.

Most important element of this new analyzer is a polaroid photo-electric system of unique design which G. E. developed. Fourteen of these highly sensitive devices are installed on the machine, thus permitting the accurate, speedy solution of differential equations requiring as many as fourteen simultaneous integrations.

Differential analyzers of a type similar to this device were first developed by Dr. Vannevar Bush of atomic bomb fame, formerly of Massachusetts Institute of Technology.

Half a Million Dollars Granted B. C. University

DISTRIBUTION of a $5,000,000 grant by the territorial government for expansion at the University of British Columbia has been announced. Half a million dollars has been ear-marked for an addition to the Science building, and for the provision of additional laboratory accommodation. A further $500,000 is voted for additional lecture room accommodation; $600,000 will be used in the construction of a new wing to the present Library building at the University.

The civil and mechanical engineering departments will receive $300,000 for the construction of applied science laboratories; $100,000 is provided for a separate building for home economics. The Department of Agriculture will receive $200,000 for erection of a new building and for the clearing of land to be used by this department. Cost of a new gymnasium for physical education is estimated at $50,000. Biological science buildings will cost $500,000, while expansion to power plant facilities will involve expenditure of $300,000.

This leaves a total of $1,950,000, which will be used in the construction of buildings for the new faculties of medicine, pharmacy and law, which are to be established at the University, and also for the construction of dormitories. These buildings will be erected within a three-year limit.

Supplementing the expansion to take place on the University campus, the University authorities are also considering the erection of forestry buildings with sleeping and classroom accommodation, on the 10,000 acres of southern Garibaldi Park, near Port Haney, B. C., which were recently turned over to the University. Announcement to this effect was made recently by Dr. Norman MacKenzie, president of the University. Two large grants have been made to the University of British Columbia, one by the fishing industry, and one by the lumber industry, through H. R. MacMillan and his associated companies, for the purpose of expansion of research activities in connection with these two industries.

Fewer Motor Vehicles Registered This Year

THE ESTIMATED total number of automobiles, trucks and buses registered in the United States in 1945 is only slightly less than in 1944, according to figures compiled by the Public Roads Administration.

The net decrease in 1945 registrations is estimated at 213,000, or about 0.7 per cent of the 30,086,189 registrations reported in 1944. The figures do not include publicly-owned vehicles.

Automobile registrations are expected to reach 25,137,000 in 1945, 329,331 less than reported in 1944; trucks, 4,629,000, an increase of 115,000; and buses, 106,518, approximately the same as 1944.

Western state registration figures follow:

STATE	Vehicles Registered	Percentage of Change
Arizona	136,497	—0.5
California	2,815,606	+1.3
Colorado	330,324	—0.1
Idaho	146,233	—0.9
Montana	156,280	—0.7
Nevada	44,855	—4.1
New Mexico	114,948	+3.1
Oklahoma	492,378	—0.6
Oregon	410,219	—0.1
Texas	1,543,806	—0.6
Utah	148,867	—2.9
Washington	609,960	+1.1
Wyoming	79,405	—2.1

U. S. Railway Mission Helps Modernize Mexican Railroads

During the war, when millions of tons of critical war materials needed to be moved, the U. S. Railway Mission worked with the Mexican Railways to repair and enlarge their backward system—Miles of track were replaced and bridges were rebuilt—Diesel locomotives were purchased and the train communication system was greatly improved

By ROBERT J. de CAMP
Director of Rail Transportation
Office of Inter-American Affairs
Washington, D. C.

WHEN THE LARGEST and by far the most important business enterprise in a country is undergoing a tremendous and revolutionary social experiment and at the same time experiencing the impact of the greatest world cataclysm of all times, there develops a situation of prodigious importance. It was this very combination of circumstances that confronted the Republic of Mexico during the early days of Great War II, at a time when she was groping to find a way to administer and operate the railroads which she had seized by expropriation in June, 1937.

Administered at first directly by the government, these great arteries of commerce—the very lifelines of the nation—were turned over in April, 1938, to the workers themselves, under a law signed by President Cardenas. This was something so revolutionary and radically new in railroad operation that the experiment has been watched with great interest by governments all over the world.

Then came the Great War, and the Allied nations were soon cut off from the sources of supply of many of the most critically needed minerals, metals and other strategic war materials. In these dark, critical hours, an anxious world turned its attention to the rich natural resources of Mexico and of Central and South America.

From the mountains and plains of Mexico have come some of the most critically needed war materials: antimony, molybdenum, lead, mercury, zinc, graphite, copper, tin, arsenic, cadmium, tungsten, cobalt, fluorspar, vanadium, manganese—also, henequen, ixtle, mahogany, rubber and other equally important items. Whereas approximately 75 per cent of all trade between Mexico and the United States had been borne by water before the war, practically all traffic to and from Latin America now fell upon the Mexican National Railways.

The Mexican organization

Several steps were taken by the Mexican Government to work out the rights and relationships of the members of the Railway Workers Union (Sindicato) with the railways. Under the presidential decree of March 9, 1944, amending several articles of the law of Dec. 31, 1940, there was created an Administration of the National Railways of Mexico, placing the administration of the lines in the hands of a general manager appointed by the president. The general manager is assisted by an advisory board of nine members, of which he is one and serves as its chairman, while the Secretaries of the Treasury and Public Credit, Communications and Public Works, Agriculture and Development, and Labor and Social Welfare, the Confederation of National Chambers of Commerce and Industry, the Confederation of Industrial Associations of Mexico each name one member, and the Railway Workers Union names two.

The general manager is charged directly with the administration, operation, improvements and additions of the lines, also with the acquisition and distribution of both property and funds.

The United States War and Navy Departments were familiar with the inadequacy of the Mexican Railways to carry additional tonnage. On July 15, 1941, an agreement had been made with Mexico whereby it agreed to sell her entire exportable surplus of a large list of minerals and metals to the United States, and subsequent agreements called for increased production and an expanded list of items. Moving this vast tonnage of heavy items was no small matter, for this program called for a minimum production of over 2,000,000 tons, without taking account of moving increased production from mines to smelters, or of the great increase in transportation demanded by a rapidly expanding domestic economy.

In the early days of 1942, a small group of expert transportation technicians were dispatched to Mexico to make a quick study and report on the physical conditions and equipment of the National Railway lines. All earlier reports were abundantly confirmed and urgent recommendations were made that a major rehabilitation program be instituted at once, else the notorious scarcity of cars and locomotives and the poor condition of the roadbed would surely result in a breakdown in operation that might come at the time of our greatest national peril.

Joint rehabilitation program

In November, 1942, through an exchange of notes between the two governments, an agreement was entered into for a joint program of rehabilitation of certain key lines of the National Railways in order to assure maximum efficiency in operation of the railways for the transportation of strategic war materials. The lines selected for rehabilitation were: (1) Laredo to Mexico City via Monterrey, Saltillo and San Luis Potosi; (2) Torreon-Monterrey via Paradon; (3) Cordoba-Suchiate via Jesus Carranza and Ixtepec; and (4) Chihuahua-Torreon. The objectives were twofold: first, to provide uninterrupted rail service from Nuevo Laredo on the Texas border to Suchiate on the Guatemalan border—a distance of over 1,700 mi., and thus provide a continuous rail route to Central America; and second, to make possible the continuous movement of strategic metals and other important items to the United States.

Almost coincident with the signing of these notes, the Office of Inter-American Affairs created the United States Railway Mission in Mexico and, with little delay, over 50 expert railway technicians were recruited from the railroads of the United States. The ready response with which the railroads answered this call at a time when they were themselves in sore need of additional trained technicians, will always stand forth in testimony to their high patriotism. At its height, the Mission had a staff of over 150 members, whose work was divided into five important functional departments: Maintenance of Way, Transportation, Mechanical, Stores and Reclamation. Accounting was also made the subject of an exhaustive study and that department is now being modernized with the latest of business machines.

Improvements undertaken

Faced with the necessity of moving several million tons of strategic minerals, metals and other critical war materials over a railway scarcely able to handle its own domestic traffic, the Mission, in cooperation with the railway's management, started a vigorous program of rehabilitation that enabled this major railway system (about 8,500 mi. long) to continue operating without experiencing a single suspension, except for temporary interruptions caused by devastating floods. Many thousands of defective cross-ties were replaced, light, worn-out and defective rails were replaced with heavier rail, properly tied and anchored so as to permit speedier and heavier movement of traffic under safe conditions. Several hundred thousand cubic yards of new and proper size ballast were placed—much, where none existed before—while bridges were rebuilt or strengthened, many new sidetracks installed, terminals enlarged and improved, repair shops reorganized and modernized and a reclamation plant organized at San Luis Potosi where thousands of tons of discarded materials and equipment were repaired and reworked into useful items.

Vast quantities of repair and replacement parts and other materials were needed to keep locomotives, cars and

other equipment in service and to restore to use the exceptionally large number of such units out of service and in need of major repairs.

In Washington, a special department was set up in the Rail Transportation Division of the Office of Inter-American Affairs to assist the Mexican National Railways in procuring priorities for all orders of material and equipment placed in the United States which included, among many other items: axles, tires, wheels, boiler tubes, fire box and tank plates, pipe and fittings, bearings, copper ferrules, tools and other materials for track and bridge repairs, and an endless number of items for use in repair shops.

Communication systems

As an illustration of the marked change and vigorous progress that has been made in the rehabilitation and modernization program on the Mexican National Railways arising out of the studies and recommendations of the United States Railway Mission in Mexico, it is interesting to review what is going on with respect to the signaling and communications systems. From a relatively primitive communications system, the railways are fast adopting the most modern practices and ideas and have inaugurated an ambitious program for completion over the next several years.

Twenty-one kilometers of centralized traffic control between Mexico City and Lecheria have been in operation for several years, but it is now proposed to build an additional 17 km.—Julia to El Olivar, 27 km.—Mariscola to Escabedo and 87 km.—Mariscola to Irapuato. Twenty-three kilometers covering the important bottleneck, La Griega to Mariscola, is now being installed and is scheduled for completion by Dec. 1, 1945.

A telephone train dispatching circuit of 391 km.—San Luis Potosi to Saltillo—the most modern of communications system has been authorized for early installation.

Trial installation of inductive train telephone has already been completed over the 314 km. separating Mexico City and Escabedo.

Space radio is in service also on a trial basis over a distance of 1,022 km. between Mexico City and Monterrey that provides one telephone trunk circuit and one teletypewriter circuit.

A carrier system, likewise on a trial basis, has been installed between Mexico City and San Luis Potosi, a distance of 525 km., which provides one telephone trunk line from Mexico City to San Luis Potosi, one from Mexico City to Queretaro (269 km.), and another from Queretaro to San Luis Potosi (256 km.). A duplicate number of channels have been provided for teletypewriter circuits between these same points. This carrier system has been superimposed on the existing telephone train dispatching circuits.

Rolling stock improvements

The extensive studies and accompanying recommendations of the Railway Mission have been guided by two objectives: (1) the immediate needs of the railways of an emergency character so that the prosecution of the war might be accelerated, and (2) the long-term view or more permanent rehabilitation that would modernize and improve the service and conditions on the National lines. To these ends, improvements and additions have been made to motive power and rolling stock. For the first time Diesel electric engines have taken their place as standard equipment on the lines, and 46 Diesel locomotives have either been delivered or are on order for delivery in the near future. In addition, 32 new steam locomotives have been contracted for and will be used to replace a considerable number of motive power units that have outlived their usefulness.

Fifteen hundred new all-steel box cars are now in the process of building in the United States and negotiations are currently under way to purchase 2,000 additional freight cars of different classifications. In order to meet the present need for passenger cars, 30 second-hand cars have recently been purchased together with 4 second-hand baggage and mail cars. Negotiations have also been instituted for the purchase of new modern steel passenger coaches. The need for modern freight and passenger cars has been very acute, but the strict production limitations prevailing in the railway manufacturing industry in the United States have made it impossible to satisfy this need.

During the year 1944, 14,000 tons of steel rails were procured from the Mexican steel mills at Monterrey, and now that war restrictions in the United States have been removed, orders for 50,000 tons of 112-lb. rails have been placed with the United States steel mills for delivery starting in 1946.

It is important to emphasize that all the purchases enumerated in this article have been or will be paid for by the Mexican National Railways themselves or by the Mexican Government. From the Mexican point of view, however, the most important contribution is the technical assistance that has been given to the 55,000 employees of the National Lines by the technical staff of the Railway Mission.

Too Low Ceramic Price Causes Building Delay

MORE THAN HALF of all private buildings scheduled to start in the immediate future, excluding public utility projects, will be indefinitely delayed, and re-employment in the building trades will be curtailed, if the Office of Price Administration fails to grant moderate price increases on facing brick and certain kinds of structural tile, J. Ernest Fender, president of the Structural Clay Products Institute, reports.

"Price increases of 10 per cent are required to permit manufacturers of brick and tile to meet current demands for higher wages, and a sufficient number of workers can not be obtained under present conditions until those demands can be met," Fender said.

"Scores of urgently needed projects, including veterans' hospitals, are being delayed because of a severe shortage of brick. In addition, little progress can be made on the construction of new factories needed to increase the production of civilian goods and to expand industrial employment until the manufacture of brick and tile is restored to a more normal level. The recent WPB order removing restrictions on industrial construction is being largely nullified by the brick shortage, inasmuch as masonry construction is widely used for industrial buildings.

"More than half of the industry's 800 brick and tile plants are completely closed down at the present time because of a shortage of labor, and production is only about 15 per cent of normal in the face of a large backlog of orders for industrial construction and other purposes.

"Requests for a general price increase of 10 per cent have been pending before the OPA for six months."

Airports Are Called Surplus Only If They Remain Intact

ACTING IN COOPERATION with the Surplus Property Administration, the War and Navy Departments have issued orders that airports to be declared surplus must be left intact.

Commanding officers have been instructed to see that neither installations nor buildings are stripped of equipment, except where such equipment is in short supply and needed at other airports.

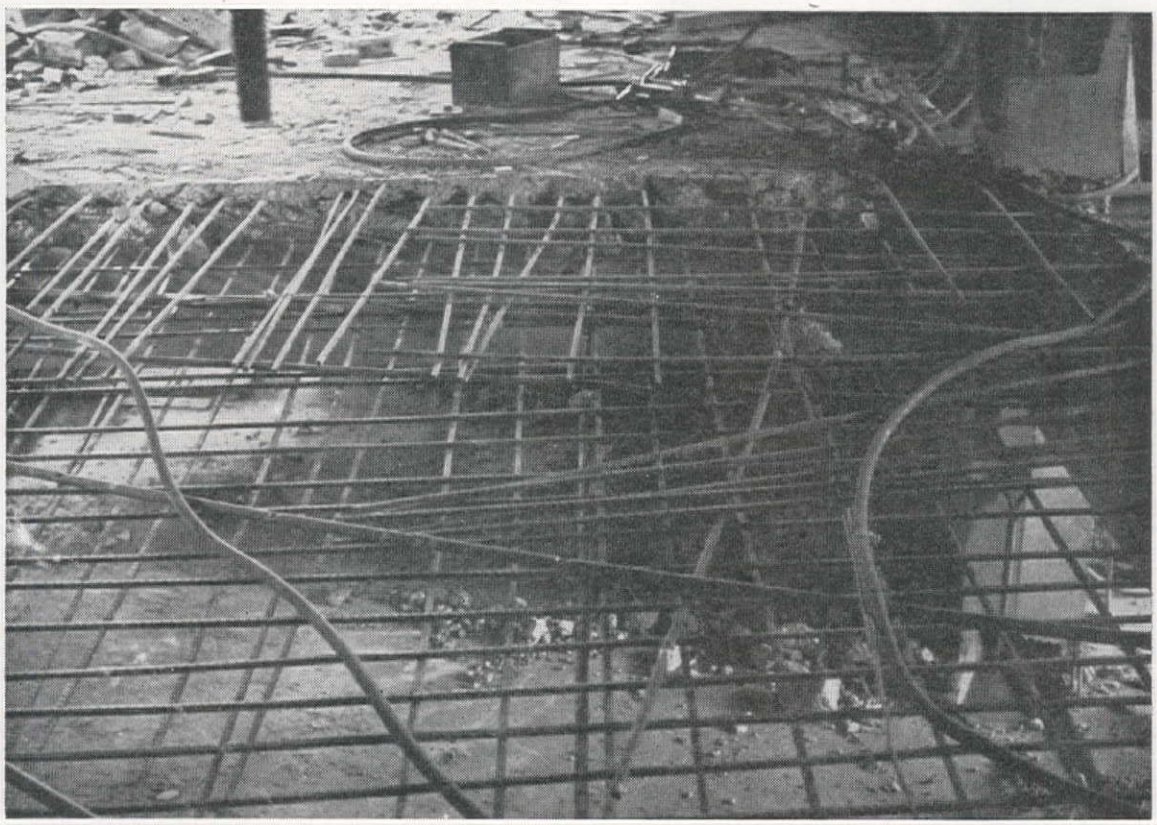
Best indications are that upwards of 700 airports, valued at more than $2,000,000,000, will be declared surplus by the Army, Navy, Reconstruction Finance Corporation and the Civil Aeronautics Administration.

A Surplus Property Administration regulation governing the disposal of airports is being drafted.

Los Angeles Allots Two Million for New Sewer

MAYOR BOWRON of Los Angeles, Calif. has signed a city ordinance appropriating $2,000,000 from the city's reserve funds to finance immediate construction of a new submarine outfall sewer at Hyperion, where the present outfall is badly disintegrating (see *Western Construction News* for May, 1945). The voters of the city last spring approved a bond issue of $10,000,000 to rehabilitate the entire sewer system of the city, including a new treatment plant at Hyperion. Considerable discussion has arisen in the city council and elsewhere regarding the location of the treatment plant, some favoring a location on the ocean shore, approximately in the same spot as the existing plant, and others preferring a site hidden in the sand dunes some distance inland from the shore. No decision has as yet been reached. It is believed that the sand dune location would add materially to the cost of the plant and the submarine outfall.

Famous Seattle Block Altered



THE NEW FLOOR at street level as seen through the grill of heavy reinforcing bars in the original first floor where the concrete has been broken out with the use of air hammers. New architectural plan required removal of structural members.

The Old Times Building, constructed of massive steel and concrete to support heavy printing machinery, proved to be a difficult alteration project when some of the floor elevations were changed to coincide with the Fifth Avenue level

THE OLD TIMES BUILDING, built in 1916, has long been one of the landmarks of Seattle, Wash. A triangular-shaped building, it is located at the junction of Fifth Ave., Westlake Ave. and Olive St.

When built in 1916 by C. B. Blethen, publisher, it was intended to be a monumental home for the "Seattle Daily Times" and the Times Publicity Company. No expense was spared in the design and construction of the edifice, and it is estimated that the building could not be reproduced today for less than one and a quarter million dollars.

It was erected as a five-story building, with basement and sub-basement. Columns and floors were extremely heavy design to support heavy printing machinery, and to give the structure permanence and stability. Exterior walls at the ground are of thick granite slabs, while the upper stories are finished with heavy terra cotta. The sharp corner of the triangular building is at the intersection of Westlake and Olive, and the base of the triangle runs along Fifth Ave. Since the two streets along the sides of the triangle are on a considerable grade, the original ground floor was constructed at an average level, so that the main entrances of the structure, located in the center of the long sides of the triangle, open approximately level with the ground. This caused the first floor level to be considerably depressed below the street at the narrow point, but to be 7 ft. above Fifth Ave. along the base of the triangle.

Building alterations

The structure is being converted into commercial uses, according to plans prepared by J. Lister Holmes, Seattle architect. The new main floor will be level with Fifth Ave., which requires eliminating the old first floor slab, original stair construction, elevator well and machine foundations. The exterior walls are also being altered to fit the new conditions, necessitating the removal of granite blocks, steel spandrel beams, and masonry.

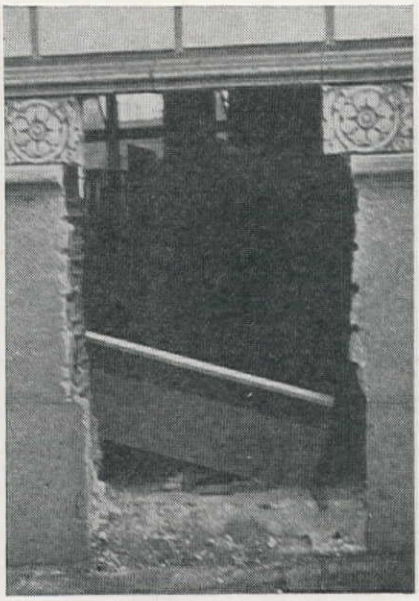
A branch bank will occupy the main corner, another section will be used as quarters for a large real estate and loan company agency, a branch post office will be installed in another section of the building and various offices will use the upper stories.

The floor system between the center entrance and the point of the triangle, now occupied by a restaurant, was not disturbed.

Major structural changes were necessary to the work. They include the removal of several floors and the placing of new structural slabs. Heavy fireproofed steel girders were cut out and removed after the new floors were poured. Exterior doorways were cut to permit access on the Fifth Ave. level.

Construction methods

The breaking and removal of concrete took eight weeks time, and in the work there were employed two portable air compressors and five concrete breakers. Cutting and removing of girders was done by a gang of structural steel workers using three torches and a portable A-frame hoist. The cut-out girder sections were cut into sections suitable for hoisting onto and removal by trucks, while broken concrete and other debris was hoisted to a hopper and chuted into trucks for disposal.



GRANITE FACING broken out for a new street level doorway, showing rows of drillholes along the breaking line.

New concrete was mixed on the ground level and raised in concrete buggies to the level of placement on a winch operated hoist erected outside the building at one corner.

Safe deposit vaults for the banking institution are built in the basement, with foundations running through the subbasement floor. New fireproof stairways were constructed throughout to bring the structure into line with city ordinances.

Contract

The contract for the alterations and improvements was awarded to J. B. Warrack Co. of Seattle, a firm which has had much experience in alteration and modernization of buildings. The amount of the contract was for $128,000. Work began on July 1, and was complete December 1.

Included in the general contract were the suspended ceilings, ornamental iron windows, a marble floor in the banking quarters, heating, ventilating, changes and improvements in plumbing, modern fixtures, a new electrical layout, and painting and decorating.

Carroll, Hillman and Hedlund, Inc., are agents of the owners of the building. Bob Riesche is superintendent for the Warrack company.

Ash from Idaho Volcano Protects Potato Cellar

ASH FROM THE CRATERS of extinct volcanoes in the Upper Snake River Valley of Idaho is being put to a new use by Marion L. Murdock of Sugar City, Ida., a potato dealer.

He is using the ash from a crater 14 mi. northwest of Sugar City as insulation on a 500 by 60-ft. potato cellar, one of the largest in the state. Light and porous and therefore a good insulation, the ash is being used to fill 21-in. double walls on the exterior of the structure and to cover the roof. The insulation will not only keep the interior of the cellar at the proper temperature for best storage conditions but will also prevent deterioration of the peeled lodge pole pine framework.

Most potato cellars are covered with dirt which retains moisture and hastens rotting of the timbers. Unlike ordinary potato cellars which are underground except for the roofs, the Murdock cellar is above ground to avoid subwater from the South Fork of Snake River and to avoid incline in truckways.

Kaiser Magnesium Plant Paid For in Four Years

HENRY J. KAISER, president of Permanente Metals Corp., announced recently that the government has been repaid in full for its RFC loan of $28,475,000 on the magnesium plant at Permanente, located near San Jose, Calif., and allied plants at Moss Landing and Natividad, Calif.

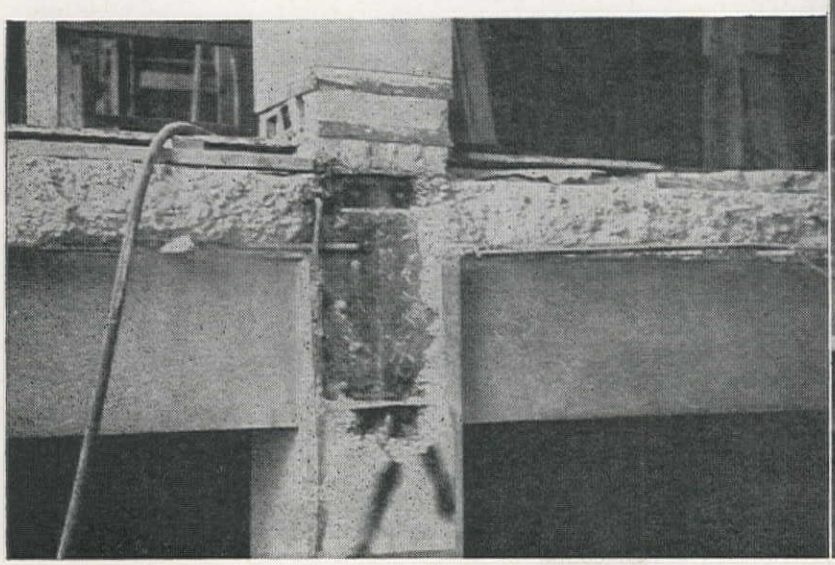
In making the final payment on the ten-year loan, which has been settled six years before maturity, the Permanente Metals Corp. has paid the government an additional $3,500,000 in interest at the rate of four per cent.

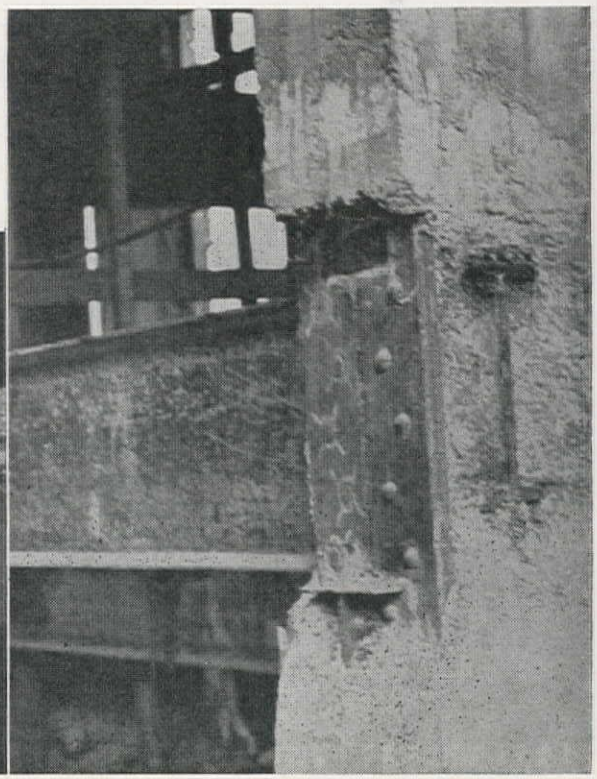
Built in 1941, the magnesium plant produced 20,000,000 lb. of ingot and 86,000,000 lb. of incendiary material for the war effort. The latter product, a bomb filler known as "goop," played an important role in the destruction of Japanese industrial centers. Permanente was the only magnesium plant in the United States capable of supplying such material.

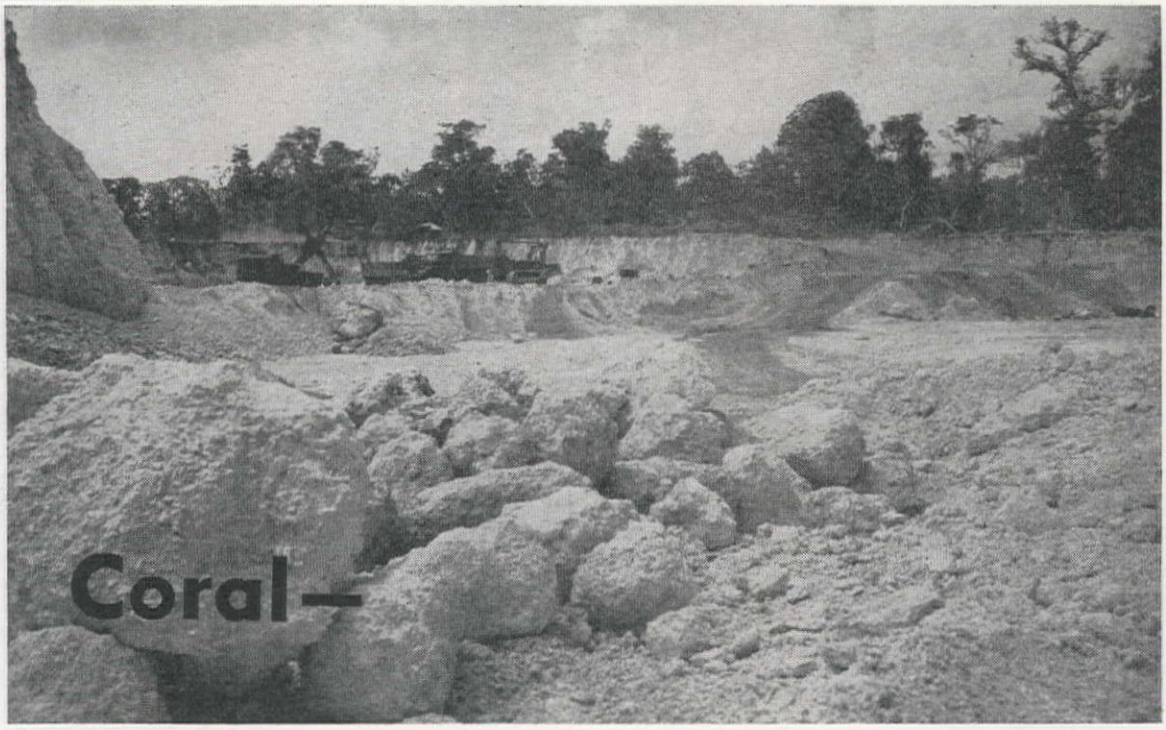
The Moss Landing and Natividad facilities, now operating at capacity, were established to supply the magnesium plant with raw material but have since developed other products in demand by the manufacturers of chemicals, steel, building materials, rubber, paint, paper, oil, agricultural fertilizers, and refractories. Kaiser recently announced the construction of a new brick plant at the Moss Landing location.

In discussing Permanente's return to magnesium metal production, which was curtailed following V-J Day so process changes could be effected, Kaiser said that studies and experiments to date confirm the prediction that the plant will be able to compete successfully in the production of the lightweight metal.

A THICK FLOOR SLAB and supporting girder removed from the original structure before the new construction was initiated, below. Removal of structural members up to 24 in. in size required multiple cutting to reduce them to sizes that could be easily removed from the building.







A Versatile Construction Material

Coral, extensively used in the construction of military installations throughout the Pacific, has proven to be an excellent material adapted to speedy construction with good wearing qualities, low maintenance and rework requirements — It was sorely missed by construction workers in the Philippines where shale churned to deep mud

ONE OF THE GREATEST engineering difficulties the Army faced when it landed on Leyte in the Philippines was the construction of roads and airfields without the use of coral, the western Pacific formation that had made basework a pleasure instead of a headache.

All the way up from New Guinea, across the ocean at Kwajalein, back at Midway and in the Palaus and Marianas groups, coral solved every problem. When roads had to be pushed through impassable swampy rice paddies, trucks simply started a ribbon of coral across the land. When tropical rains reduced red lava clay to sticky solvency, coral fills went ahead just the same. In searing, dry-as-dust weather, Seabees laid coral down without the aid of too many water wagons. Under all these conditions the net result was about the same: the engineers got a stable, excellent wearing surface with a high bearing factor.

While all military construction is well planned and soundly forecast, much of the actual field work is empiristic. In many soils, hasty construction procedure left a wake of bearing failures, heavy maintenance and re-worked construction. Not so with coral. Everywhere, engineers agree, coral stood the test of speedy construction remarkably well; so excellently, in fact, that it was missed as soon as the front moved up to the Philippines and Iwo Jima.

A thousand uses

Through the Southwest and Central Pacific, coral was used for roadbuilding, airstrips, parking anchorages, taxiways, warehouse floors, campsites and foundations. It was crushed, run through batch plants, mixed with asphalt and used as asphaltic concrete. It was even used successfully as cement to make concrete.

Unlike soils, which have a slightly variable density under different compaction conditions, coral settled down to its optimum density about as well one way as another. On Guam, Seabees made road fills 35 ft. high by dumping coral in 12-in. lifts with very little compaction except a lightly ballasted sheepsfoot roller. One completed fill was opened to traffic as soon as it was graded, just about the time 13 in. of rain fell over a period of 2 weeks. The top of the fill remained stable, and the heavy rains scarcely eroded the sides, so well had the "rule-of-thumb" worked!

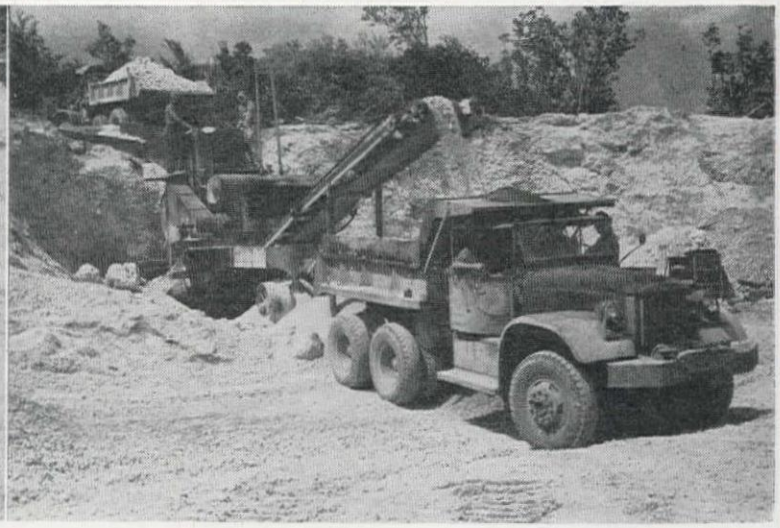
This is not to say that highly favorable laboratory conditions would not produce more density. It does mean that Seabees built fills adequate to carry excess loads of military traffic, and that was the result that counted considerably toward the phenomenal advance of the Pacific front.

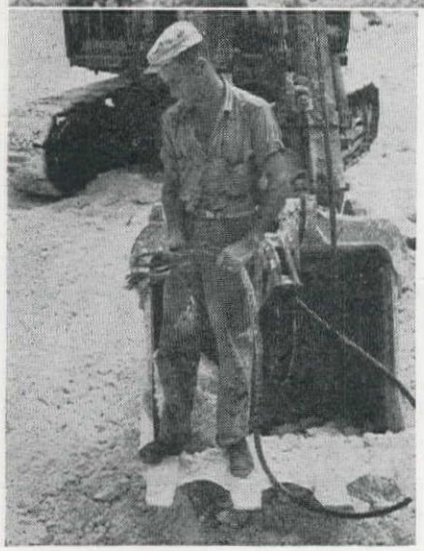
When the big base at Guam was developed, coral was used extensively. It is found on this compact, clean island in forms varying from fine coral sand to solid rock. The best form for roadbuilding occurred in massive deposits in the hills away from the beaches. Coral was found here in particles as white as, and about the size of, ordinary popcorn.

Handling the coral

Open-pit quarrying and placing of this material was highly mechanized. Most of the coral could be excavated by power shovels, although in one 1,000,000 cu. yd. pit it was found that light blasting would increase the output of a 2½-cu. yd. shovel by as much as 30 per cent. Where shovels and trucks were used the pits were generally benched down in 12 to 15-ft. steps and coral was removed to a common depth of 100 ft. or more.

Where tractor-drawn carryalls were used, it was nearly always necessary to use a ripper to break the coral up sufficiently for loading. The heaviest rippers broke in teeth and frames, because it was always necessary to use a tractor of the 110-hp. class as a push-cat to force the machine through the formation. Where machine failures occurred, the parts were made heavier or reinforced in the field.





LOADING CORAL from one of many quarries located on Pacific islands, above left. A portable crushing plant with a conveyor belt loading surfacing material, right. Hard and accelerated digging, often by inexperienced operators during the initial stages of the campaign, caused a heavy toll in hoisting rope failures, lower left.

One tractor operator, working his machine in a pit in solid coral rock outcropping, pushed so hard he sheared all the bolts off the track frame where it supports the push arm trunnion. The holes were tapped and enlarged one-eighth of an inch larger than factory specifications to take a larger bolt that would stand the gaff. It worked.

Equipment performance

Because of military urgency, all construction operations always depended on the continuous performance of excavating and hauling machines, and sometimes these operations were so efficiently integrated that asphalt crews worked on highways only a few hundred yards behind the earthwork crew. Foolproof fueling, lubricating and service schedules were set up by all battalions, but occasionally other trouble appeared.

One big trouble was the breakage of wire rope. New operators were always being trained, and new operators are notoriously hard on wire rope because they inadvertently jerk equipment, accelerate a load unduly fast, and their failure to break it in properly caused many a shovel hoist line to break above the dipper bail after only five or six hours' service.

As the operators became better trained, and as the maintenance and supply men became more accustomed to the fact that the Navy Department had ordered different constructions and grades of wire rope for different purposes, they began to select earthmoving equipment rigging ropes carefully. When preformed lang lay rope was installed in shovel hoists the Seabees soon found that it was already broken in, and because all its wires are laid in place at the factory, this rope lasted up to 50 per cent longer under constant use. Furthermore, since the broken crown wires of preformed rope do not wicker out, considerably less wear of sheaves was noted.

Small parts like fuel filters, bushings and grease fittings were kept on each machine by the maintenance mechanics, and present-day servicemen-operators are much more proficient than those of three years ago, for they have learned to repair as well as operate their tractor, shovel, dragline or other equipment.

Rapid production

In one big pit on an island in the Marianas, operated by Seabees, 7,000 cu. yd. of coral were transported each day to an airfield, roads, and a building site.

Seabees were equipped with a number of portable rock crushers, capable of being mobilized in a hurry, grouped if desired and each rated at 60 tons of crushed stone an hour. They were fed by machines which loaded calcareous rock out of the hard formations, and their output fed concrete mixers and asphalt plants all over the Pacific.

The ultimate, in the use of coral, is not ever likely to be reached. It was forecast the other day on Iwo Jima by an Army fighter pilot, who landed his Mustang on a lava-cinder strip and looked down in dismay to see his propeller wash blowing a cloud of dust off the runway.

"You ought to send for the Seabees," he said through the intercom to the tower, "and get 'em to haul some coral from Guam up here. It wouldn't blow off this way."

Construction Started on Three New Generators for Coulee Powerhouse

ACTING UNDER recently revitalized contracts, three companies have begun construction of parts for three new 108,000 kw. generators for Grand Coulee Dam. When installed, the units will cost approximately $2,000,000 each and will give Grand Coulee a capacity of 992,000 kw.

The new units, together with six mates of equal size, are the largest hydroelectric generators in the world and are intended to serve the world's biggest pumps besides supplying electricity for Northwest homes and industries. The pumps, to be installed upstream near the west abutment of the dam, will provide water for the Columbia Basin Irrigation Project, largest ever planned in the United States.

The generators will be constructed by the Westinghouse Electric Corp., East Pittsburgh, Pa.; the governors will be built by the Woodward Governor Co., Rockford, Ill., and the 150,000 hp. turbines by the Newport News (Va.) Shipbuilding and Dry Dock Co.

Installation of the three new units will complete the capacity of the powerhouse on the west bank of the Columbia River. This powerhouse now has six 108,000 kw. generators, two 75,000 kw. generators, and two station-service units of 10,000 kw. each. The 75,000 kw. machines, assigned to Grand Coulee during the war, will be removed for installation at Shasta dam in California.

Still awaiting generators and turbines at Grand Coulee is the east powerhouse, which is capable of handling nine more of the 108,000 kw. units.

What to Do With Wartime Housing

Solano County Planning Commission studies one of the West's worst examples of low-grade war housing at Vallejo, Calif., and disagrees with Federal Public Housing Authority that the units should be maintained in the postwar years, favoring instead early dismantling

THE ULTIMATE DISPOSAL of Federal public "war" housing in Vallejo, Calif., will be a major factor in determining the economic stability of the area in the years ahead, and the Solano County Planning Commission has issued the following report, based on considerable study:

The Federal Public Housing Authority has announced the following policy for disposition of war housing:

"Permanent" units

1. Permanent war housing will be sold for private residential purposes unless transferred for use by other Federal agencies or other uses specifically authorized by Congress.

2. Permanent war housing may be used for low-rent public housing when requested by local communities and specifically authorized by Congress.

In their interpretation of permanent war housing, FPHA includes the following projects in Vallejo:

1. Federal Terrace Project (portion).
2. Chabot Terrace Project.
3. Carquinez Heights Project.

The total number of units in these projects classified as permanent is over 5,000. These units are to be sold in accordance with the following order of preference.

1. Present occupants.
2. War veterans.
3. Prospective occupants.
4. Private investors.

FPHA has a plan whereby a Mutual Ownership Corporation may take title to a project under purchase agreement with the Federal government and operate it on a non-profit basis. The corporation will manage the project, paying taxes and insurance, the costs of maintenance and major repairs, and amortization and interest at 3 per cent on the unpaid purchase price. Each purchaser will make monthly payments covering his share of these items.

The amount to be paid for this permanent war housing has not been set; however, the Lanham Act required that such be the full market value as established by competent appraisal.

"Temporary" units

Temporary war housing must be removed within two years after termination of the emergency. It should be noted in this matter that the "termination of the emergency" in World War I did not take place until two years after the armistice.

The following prospects are considered as "temporary": Victory Apartments, Solano Apartments, Amador Apartments, Hillside Dormitories, Lakeview Homes, Northside Dormitories, Floyd Terrace, Guadalcanal Village. Although Floyd Terrace and Guadalcanal Village are officially classified as temporary, one public housing official has suggested that they be brought up to a permanent standard for low rent housing.

Good housing is the backbone of the American standard of living. It is the indicator of character, economic stability, desirability and health of a community. The importance of the disposal of public housing must not be underestimated for it will to a large degree determine the future of Vallejo, and all communities with similar problems.

Most people have thought that the Federal public war housing would be demolished and removed as soon as possible after termination of the war. However, the policy of housing officials is not in accord with this. This can be readily understood when we consider the large number of positions created by the operation of public housing during the war. The Vallejo area alone has employed over 600 people directly in public housing—it is natural for these employees to work for retention of war housing or disposal on a basis that would provide a maximum of positions for them.

In analyzing the public housing disposal problem with the interest of the community in mind, the following is evident:

1. The demountable units at Carquinez Heights and Chabot Terrace are not and should not be considered as permanent housing. These units cannot be brought up to any standard of good construction by exterior or interior face lifting. The **only** public housing that has been constructed in accordance with good construction practice is Roosevelt Terrace, built by the Navy.

2. The sale of public housing to present occupants, war veterans, or others will implant in Vallejo an undesirable area of substandard housing that cannot be maintained on any reasonable economic basis. It will create large slum areas and will effect a tremendous depreciation of property values in the community. The cost of government in areas of poor housing is always out of proportion to tax payment made.

The sale of public housing will put a definite stop to the development of good, private housing by individuals, contractors, and subdividers. No one wishes to invest money in an area where the market for the commodity will depreciate or is uncertain. This is already apparent in Vallejo, where there is little activity in the construction of private housing despite a definite need and demand.

It is probable that speculators could realize substantial profits in purchasing war housing, giving the buildings a face lifting and reselling. The ultimate person to purchase and reside in the house would be the loser as well as the community.

3. The proposal of public housing officials to set up a non-profit corporation for mutual ownership is absurd when considered in relation to Vallejo's so-called permanent public housing. It costs $2,600,000 per year for administration, operation and maintenance of public housing in Vallejo, not including certain special grants. This amounts to approximately $10.00 per unit per month (including single room dormitory units), an amount that could probably be reduced considerably by efficient management but which would tend to increase at a rapid rate as the houses aged and maintenance costs increased. It is obvious that any project purchased and operated would be in financial difficulties in a short time or the houses would be left to deteriorate completely with the people ultimately moving out. The only alternate would be subsidies by federal or local government.

4. The suggestion that the existing poor types of private housing in Vallejo be supplanted by turning public war housing into low rent public housing is certainly not very feasible. The recent report of one housing official mentions 1,289 units of slums in private ownership. Actually it is probable that the majority of these buildings are better constructed than the public war housing. While it is agreed that "slum" conditions should be removed, it will not help the situation to supplant them with more substandard dwellings operated by government.

5. The sale of a portion of the projects to farmers for housing for seasonal workers or for sheds or other farm buildings might be feasible; however, it is recognized that the number required in Solano county would be limited. It is certainly not essential to create a County Housing Authority to operate migratory workers' housing. This suggestion of housing officials is one which would in the main create positions for present public housing employees and would lend itself toward making seasonal workers non-migratory and in increasing the county's relief roll.

Important essentials

In the solution of this important problem the Planning Commission feels the following are essential:

1. A unified public demand that all federal public war housing be demolished and removed as soon as possible. This, of course, would have to be in accord with the desires of the Navy for temporary operation of a portion of the projects.

2. A definite statement of policy by the federal government on such removal

and date of removal. This would encourage private housing construction in the area.

3. The ultimate abolishment of the local public housing authority.

4. The use of the materials from the demolished units in the devastated areas in the Pacific war zone or for farms.

5. The encouragement of private housing of various price classes and of owner-occupancy of such housing by development of community facilities so that Vallejo will be a desirable place to live.

FWA Advances Further Funds For Planning Western Projects

ADDITIONAL FUNDS FOR planning public works have been advanced to Western communities by the Federal Works Agency. These funds are made available through the Bureau of Community Facilities, and are to be repaid, without interest, when construction is begun. Localities, amounts and purposes are listed below:

Alaska

Anchorage has been advanced $10,200 to plan extensions to its water system, including dam, tank, and pipelines, estimated to cost $300,000; Juneau received $4,000 to design a community building and jail, to cost $120,000; Ketchikan, $5,600 for planning bridges, viaducts and grade separations, estimated to cost $589,600; and Petersburg, $3,500 for laying out a community building and library, to cost $90,000.

Arizona

Safford was allotted $3,400 to plan sewerage extensions valued at $76,100; Wickenburg received two allotments, $2,000 to plan municipal buildings which will cost $58,500, and $1,250 to design electric distribution improvements costing $28,000; Williams was advanced $4,464 to study water improvements, including a reservoir and treating plant, which will cost $230,000; and Maricopa county was given $4,000 for planning a $122,000 high school at Phoenix.

California

Anaheim was made eight advances, totaling $7,500, for improvements valued at $274,050, including a fire station, water mains, storm drain, sewers and treatment plant, and park improvements; another advance to Anaheim was $1,095 for planning electric system improvements valued at $40,000; Berkeley has been allotted three advances, totaling $2,200, to plan street improvements to cost $169,111, and two others, totaling $3,300, for designing sewer facilities estimated to cost $160,000; Burbank Unified School District received nine allotments amounting to $110,650 for planning two junior high schools and seven other school facilities, totaling in estimated cost to $2,510,000; Carmel Unified School District received $15,000 to plan a high school auditorium estimated to cost $290,000.

Salinas School District had an advance of $3,550 to plan a gymnasium which will cost $75,900, and another of $3,180 for a $68,410 school addition; San Luis Obispo county received $2,500 for planning sewerage facilities to cost $68,000; Santa Ana was advanced three amounts, totaling $25,127, to design street improvements, flood control works and storm drains estimated to cost $1,394,956; Santa Monica was allowed $9,000 to plan buildings and landing facilities at the municipal airport, to cost $393,000, also other allotments and estimated costs as follows: storm sewer, $1,663 and $90,000; water reservoir, $5,625 and $475,000; storm sewers, $6,476 and $285,939; sanitary sewers, $9,235 and $421,200; swimming pool, $1,750 and $77,000; fire stations, $3,000 and $170,300; municipal auditorium, $5,000 and $225,500; and a garbage incinerator, $7,200 and $344,000.

Santa Paula was allotted $3,375 to design a municipal building which will cost $150,000; Sonoma county received $32,000 to outline hospital additions at Santa Rosa which are estimated to cost $1,065,000; Stockton Unified School District was allowed four advances, totaling $19,138, to design school facilities which will cost $396,850; and Trinity county was advanced $2,500 to design a courthouse addition valued at $107,000.

Colorado

Pueblo was allotted $13,521 to be used in designing a new junior high school, estimated to cost $350,000.

Montana

Cascade county has been advanced $2,770 to draft plans for a hospital at Great Falls, estimated to cost $100,000; Chester, $2,785 for planning sewerage system to cost $83,012; Deer Lodge, $3,500 to plan a million-gallon reservoir which will cost $91,460; Park county, $9,600 for school additions at Livingston valued at $276,400; and Silver Bow county, $15,840 for a gymnasium and athletic field at Butte which will cost $419,760.

New Mexico

Farmington has received three advances, as follows: $600 for sidewalks to cost $22,800, $2,700 for waterworks to cost $120,000, and $2,600 for sewers to cost $58,320; Eastern New Mexico College at Portales was given $8,400 for planning three dormitories which will cost $387,238; New Mexico Home and Training School, $11,214 for a dormitory at Las Lunas, which will cost $331,255; and the State Department of Public Welfare, $3,000 to lay out welfare buildings at Albuquerque and Espanola, which will cost $81,200 and $42,000.

Oregon

Clackamas county has been granted two advances, totaling $9,032, to use in planning elementary schools for Oregon City, estimated to cost $256,148; Columbia county was advanced $10,650 for planning in connection with a grade school at St. Helens, which will cost $262,000; Forest Grove received $1,000 to plan a swimming pool, to cost $45,000; Portland has a federal advance of $22,830 to use in designing a bridge approach viaduct estimated to cost $1,555,790; and Tillamook Utility District was awarded $13,000 to lay out an electric distribution system which will cost $610,000 to build.

Texas

Alamo Heights has received two allotments, $323 to plan a $10,936 sewer extension, and $7,333 to plan $248,125 in street improvements; East Texas Teachers' College received $22,500 to design dormitories which are expected to cost $600,000; Fort Worth was awarded nine advances totaling $27,450 for preparing plans for public works valued at $1,139,750, including flood control, fire stations, recreation centers and water and sewer facilities; and Jones county was given five advances, totaling $17,550, for planning secondary roads which will probably cost $426,524.

Kennedale School District was given $613 to design a school addition which will cost, it is estimated, $18,638; Littlefield was granted two advances, $1,575 for sewers valued at $69,000, and $600 for waterworks valued at $29,250; Odessa has three allotments: $28,290 for planning water and sewer system improvements estimated to cost $1,007,080 for construction, $3,000 for an $85,750 municipal building addition, and $7,268 for sewer facilities which will cost $256,468.

Waco, for rehabilitation of the sewerage system, received $24,500 to plan work valued at $335,250; West University Place was given $2,615 to design a swimming pool which will cost $75,000; and Wichita Falls School District received four advances, totaling $6,300, to design school facilities valued at $225,350.

Utah

Clearfield has been awarded an advance of $200 to plan a town hall which will cost $6,300; Lindon, $720 for a water distribution system costing $20,790; Nephi, $2,500 for hydroelectric plant improvements to cost $72,130, also $8,850 for water storage reservoirs to cost $16,720; Roosevelt, $4,000 for a water supply conduit valued at $185,000; and South Salt Lake, $4,000 for a water distribution system which will cost $196,700.

Washington

Anacortes School District has a federal grant of $15,600 to plan a grade school estimated to cost $423,000; Bellingham was advanced $4,000 to aid in planning port facilities which will cost $2,344,100; Langley, $400 for a library addition to cost $9,700; McCleary, $5,500 for a sewerage system which will cost $79,750; Morton, $365 for a storm sewer system valued at $14,565; Rainier Vista Sewer District in Seattle, $9,600 for a complete sewer system, to cost $314,290.

Editorial Comment—

Engineer, Reclamation Conventions

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

DURING NOVEMBER, the annual conventions of two of the West's most important organizations were held in Denver, Colo. These organizations are the Association of Western State Engineers, and the National Reclamation Association. These two groups, more than any others, bring together those leaders in the West who have the vision and understanding of the need for unity in the great Western Empire. Dealing, as they do, with the West's greatest and most important single asset, its water, they are truly the most important groups in the region.

Western Construction News was again represented at these meetings by its Editor. No publication can lay claim to leadership in the formation of Western policy if it fails to keep fully informed of the problems in the field of water supply, division, and utilization, or if it is unaware, from lack of first-hand knowledge, of the thinking of the West's leaders in this field, be they engineers, politicians, business men, or farmers.

State Engineers

The Association of Western State Engineers convened its sessions on Nov. 12 and 13, under the leadership of President Fred E. Buck, state engineer of Montana. After a welcome by Gov. Vivian of Colorado, and the usual exchanges of felicitations and introductions, the president read his annual address, in which he pronounced a vigorous warning against the encroachments of federal control on all phases of human life, calling special attention to the dangers inherent in the Regional Authorities by which it is proposed to divide up the nation into nine autonomous governmental areas based geographically on great watershed areas. These Authorities would constitute a menace to the independence of statehood.

In practical operation, Congress will delegate its powers to the three-man board which would govern the Authorities. Citizens would no longer appeal to sympathetic state governments for relief in water and other difficulties, but to an administration far removed from the sympathies and surroundings of the problem. The existing agencies, the Bureau of Reclamation, the Corps of Engineers, the Soil Conservation Service, the various State Engineers, are fully qualified and able to care for the water problems of the different basins.

Reports from States

Interesting reports were given by the State Engineer of each state, or his rep-

IN ATTENDANCE at the 1945 convention of the Western State Engineers were, seated, l. to r.: JOHN M. SERVER, JR., editor, WCN; RODNEY RYKER, Supervisor of Hydraulics, Washington; MARK KULP, State Reclamation Engineer, Idaho; L. C. BISHOP, State Engineer, Wyoming; FRED BUCK, State Engineer, Montana; ED H. WATSON, State Engineer, Utah; M. C. HINDERLIDER, State Engineer, Colorado; GAIL BAKER, Colorado River Engineer, Arizona. Center, l. to r.: FRED THIEME, U. S. Forest Service, Missoula, Montana; C. J. BARTHOLET, Olympia, Wash.; AXEL BERG, Olympia, Wash.; DAN JONES, Assistant State Engineer, Nebraska; JOHN BLISS, Assistant State Engineer, New Mexico; HOWARD WAHA, Forest Service, Albuquerque, N. Mex.; C. H. W. SMITH, Waterworks Engineer, Phoenix, Ariz.; A. W. HALL, Bridgeport, Nebr.; Top row, l. to r.: H. H. EDWARDS, Seattle, Wash.; JOHN C. BEEBE, Federal Power Commission, Coeur d'Alene, Ida.; L. H. PERRINE, Idaho Falls, Ida.; GEORGE S. KNAPP, State Engineer, Kansas; CLARENCE BURCH, Director of Water Resources, Okla.; O. C. WILLIAMS, State Water Commissioner, Ariz.; KARL HARRIS, Dept. of Agriculture, Phoenix, Ariz.

resentative, except North and South Dakota. President Buck had asked each, in reporting, to relate his remarks to the subject, "What the End of the War Means to My State."

Culled from the reports were these items: Arizona, by O. C. Williams—"Three words constitute Arizona's future. They are 'Colorado River Water.' At the present time, pumping in the state surpasses natural recharge to so great an extent that annually the water used on 250,000 ac. of land can not be replaced. The state is hoping for early Congressional action on the huge Central Arizona project." (This project is described in *Western Construction News* for April, 1945.)

California, by Edward Hyatt—"California has had the largest population expansion of any state in the West. In the postwar we will need from 1,000,000 to 1,500,000 more jobs than were available in April, 1940. Many of these will be found in new steel and other fabricating industries which have sprung up during the war, and on farms to be created by the great Central Valley project."

Colorado, as reported by M. C. Hinderlider, was vitally concerned in the proper solution of perplexing international problems, feeling that the prosperity of this state, and all the rest, depends on maintenance of peace throughout the world.

Idaho, stated Mark Kulp, is looking forward to full development of the Columbia and Snake rivers, for navigation as well as other purposes, and the establishment of a port at the Idaho city of Lewiston.

Kansas, by George S. Knapp—"The early completion of Kanopolis reservoir is anticipated. This is a multiple purpose project which had been about 60 per cent completed by the Army Engineers at the outbreak of the war. Several other projects are also promised for early construction. All but two of the staff which had been assembled to prepare a state plan of water resources, were inducted into the armed services, but with the men returning, it is expected these surveys may be resumed soon."

Oklahoma, by Clarence Burch—"Oklahoma is in both the arid West and the humid Southeast. Last year in the Western panhandle of the state, 11 in. of rain fell, while in the southeast portion of the state a rainfall of 72 in. set a new record. Problems of the engineers in Oklahoma embrace both irrigation and flood control. A survey shows 132 dam sites in Oklahoma, and federal agencies are ready to erect structures on six of them."

Utah, by Ed. H. Watson, presented a report on a recent tour of the territory embraced by the Tennessee Valley Authority. In plain, simple language and in a winning manner, Watson told his reasons for believing the Authority was the best way to fully develop the water resources of any state, and Utah in particular. His report is reprinted at the close of this convention report. He was alone in his favorable attitude toward the Authorities, but nevertheless presented his position forcefully and clearly.

HARRY W. BASHORE, Commissioner of Reclamation, was a speaker at both Engineers' and Reclamation meetings.

Wyoming, by L. C. Bishop—"It is regrettable that certain differences of opinion existed over the ratification of the Mexican treaty concerning division of the water of the Colorado river, but now that the matter is settled, all the states in the basin are cooperating for full development of the basin." Bishop also attempted to refute Mr. Watson's TVA arguments.

Bundy and Bashore

Ora Bundy, president of the National Reclamation Association, was invited to address the meeting, as was Harry W. Bashore, Commissioner of Reclamation. They both emphasized the necessity of convincing the citizens and the Congressmen in the East that development of the West will not harm other sections of the country, but will in fact help them through creating additional markets and adding to the general prosperity of the nation.

Col. W. E. Potter, district engineer for the Corps of Engineers at Kansas City, Mo., also addressed the group, stressing the need for a complete comprehensive program of stream development. He praised the wartime activities of the Corps of Engineers, laying most credit for their performance on training received in peacetime civil work.

At the annual banquet, this editor caught a glimpse of the reason why conservative policies in government continue unpopular in the eyes of the voters. Fred Farrar, general counsel for Colorado Fuel & Iron Co., spoke for two long hours on the ability of private industry to do everything government is doing, and do it better and cheaper. The speaker is an outstanding success in law in Colorado and has held many important public and private posts in the state.

In general, this editor agreed heartily with the sentiments he expressed, but his pomposity and his dogmatic inability to see any good in an opposite viewpoint, left his speech unattractive. No wavering voter would have been convinced. The contrast with the quiet, friendly presentation of Mr. Watson of Utah, mentioned above, with whose position this editor does **not** agree, was distinctly unfavorable to big business.

Resolutions and officers

Four resolutions were passed by the Engineers. These included an appeal to Congress for supplemental funds for federal agencies investigating natural resources; reaffirmation of previous stands favoring state control of water resources and against regional Authorities; requesting from Congress additional funds for the cooperative stream gaging program of the Geological Survey; and appreciation to various participants on the program.

Officers elected for 1946 were C. S. Clark, of Texas, a newcomer to the organization, as president; Mark Kulp, of Idaho, as vice president, and Fred Buck, retiring president, as a member of the Executive Board.

On Nov. 16, a special luncheon meeting of the association was convened, at which the policy of meeting annually in conjunction with the National Reclamation Association, was discussed. By meeting thus, the Engineers' convention becomes a small tail dragging behind a large dog. Disadvantages are that the convention must be shortened in order to fit into the program of the larger group; some State Engineers are directors of the Association, and must be busy with its work; inasmuch as the reclamation meeting is largely a ballyhoo gathering, the serious work required of the State Engineers on interstate water problems and related affairs is difficult to accomplish. Accordingly, it was decided to hold an independent 4-day session in 1946.

Western Construction News approves heartily of the plan for holding a separate meeting, and compliments the Engineers on this vision of the fact that theirs is a task second to none in importance to the West.

Reclamation Assn.

The three-day convention of the National Reclamation Association can be summarized in the words "160 acres." There was the usual parade of quite acceptable speakers on the need for and problems of obtaining adequate irrigation in the West. Speakers from the Bureau of Reclamation outlined their hoped-for program for future years, and its immediate prospects. Gen. Wheeler, new Chief of Engineers of the Corps of Engineers, in his first public address since assuming office, outlined the flood control program of the Army Engineers and piously pointed out that the Engineers never initiated any programs, they only seek to do the work demanded by local taxpayers; and also that the spirit of cooperation between that agency and the various agencies in the Department of Agriculture and Department of the Interior, which deal with the nation's natural resources, is a beautiful thing to behold.

TVA, and proposed similar authorities for other areas of the country, took

a terrible verbal lambasting from David J. Guy of the U. S. Chamber of Commerce; Ellwood J. Turner of the Council of State Governments; and Lachlan Macleay, president of the Mississippi Valley Association and a resident of California. There being no one present who approved of Authorities except Mr. Watson of Utah, these addresses naturally received thunderous applause. Mr. Watson rather plaintively suggested it would be more fair if the other side were also presented, but that was no more possible than it would be in a C.I.O. or Farmers' Union meeting to allow anyone to speak against the same authorities.

There was even a 40-minute color movie giving Bob Burns' idea of how to raise potatoes, and the Union Pacific Railroad's idea of how to ship them. And there was a rousing closing banquet at which Prof. Frederick P. Woellner of the University of California at Los Angeles gave a highly entertaining address entitled "The Challenge of the Present Crisis." He seldom got around to the stated subject, but his speech was nevertheless high class entertainment, and filled with some really valuable pieces of advice, covering a whole range of activities from personal conduct to national affairs. Not the least important of these was the suggestion that the United States should "tend to its own knitting" and let the rest of the world tend to its own.

The net result of all these presentations by the speakers named above and others, and of the annual reports of officers was to create a feeling of satisfaction and accomplishment, and an assurance that reclamation is a great thing.

Comes the upset

Complaisance was roughly upset, however, when Gilbert H. Jertberg, of Fresno, Calif., read the report of a voluntary committee which has studied that part of the reclamation law which limits use of federally-irrigated land to "family-size" farms of 160 acres each. The committee asked the National Reclamation Association to go on record with a resolution urging Congress to amend the law in this particular, and even had already prepared a proposed amendment to be offered in Congress. Immediately sparks flew. The net result of about 45 minutes of fierce argument was that the proposal be sent to the Resolutions Committee for report.

Among the speakers opposing the resolution at the time was Reclamation Commissioner Harry Bashore, who made a fiery presentation of rather weak subject matter, and did it so splendidly that everyone liked him for it. He pointed out that it was necessary to go before Congressional appropriations committees and ask for funds to continue expansion of western agricultural areas through increased irrigation. Since these committees are mostly composed of representatives of eastern interests, it is necessary to show them that the work was being carried out so as to furnish homes and work for many people. (Possibly the fact that small tracts cannot be worked as efficiently as large ones may have a bearing on the Congressmen's votes, too.—Ed.)

When the Resolutions Committee report was read by Judge Sawyer of Oregon, a much weaker resolution than that proposed by the Voluntary Committee, was inserted as No. 12. It sought only to reaffirm a policy already adopted at the 1944 meeting, against the 160-ac. limitation.

Parliamentary maneuvers

The Judge sonorously read each amendment, and after each reading moved its adoption. Someone would second, and after about a 30-sec. hesitation for discussion, President Ora Bundy would call for a vote. One-by-one they were adopted. The same procedure was followed on No. 12, and it was adopted with but a few dissenting votes. The thirteenth and last resolution was concluded before someone awoke to what had happened and asked reconsideration of No. 12. The recently exhaled sighs of relief were hastily sucked back!

Then came a long and intensely interesting series of parliamentary maneuvers and impassioned speeches. Arizona moved that the reference to last year's resolution be deleted, which would emasculate the present resolution to the point of impotency. Roland Curran of California, Judge Clifford Stone of Colorado, and Judge Sturrock of Texas delivered impassioned addresses favoring the retention of the reference. No replies of consequence were made. None were required, for the amendment carried and the 1944 reference was dropped.

Then Montana offered an amendment to insert the words "on which construction has already started" following the suggestion that Congress act on requests by projects for modification of the limitation law. This of course removed from consideration the Central Valley of California and other important projects on which construction has started or funds have been appropriated, and where the modification is particularly essential. This amendment would reduce the already-induced impotence of the resolution to the fervor of a new-born rabbit. Again much oratory, with no real arguments on either side, those favoring the proposed amendment attempting to show that it didn't really weaken it, and those against protesting that it was the work of Department of Interior propagandists and socializers, of which many were in evidence about the convention.

The amendment was narrowly defeated, and the already emasculated resolution adopted with but one dissenting vote.

It was frequently pointed out in the debate, and with this view *Western Construction News* stands 100 per cent, that the Bureau of Reclamation has built up one of the finest, if not the very finest, engineering organization in the country. Its technical contributions to the West have been outstanding and approved heartily by all. But of recent years, the starry-eyed socializers, personified by Ickes-Fortas-and Strauss, of the Interior Department, have used the Bureau as a vehicle for carrying out policies entirely unrelated to engineering, and which are highly offensive to freedom-loving Americans. *Western Construction News* will never cease to praise the technical achievements of the Bureau. Neither will it cease its opposition to policies of land use limitation and sale of power below cost as a weapon in a private war.

In the heat of battle, Commissioner Bashore spoke rather hastily once or twice. He once remarked "What do we care about state laws?" It is known that this is the attitude of some of his superiors, but it was a little astounding to hear it from the usually trustworthy Commissioner. He also pointed out that whereas the Reclamation Law authorized 160-ac. farms for families, Department of Interior solicitors had interpreted this to mean that each member of a family might own 160 ac. This interpretation, a direct violation of the spirit, if not the letter of the law, obviously was made to appease those favoring larger acreages. It is actually, however, only a further argument for repealing that section, if the Bureau itself recognizes the advisability of larger farms and seeks dubious ways of circumventing the law.

Convention details

Registration was 850, plus 125 ladies. Ora Bundy was re-elected president, and all state directors were re-elected by their delegations except Arizona, who elected J. H. Moeur; Montana, new director Earle E. Tiffany; Oklahoma elected Homer L. Johnson; and Texas, who named J. E. Sturrock.

Omaha, Nebr., was selected as the site of the 1946 convention.

Among the other twelve resolutions passed were a demand that power be assessed a larger proportion of the costs of a reclamation project, and that it be required to meet more than its own costs; an expanded program of watershed research; an increase in stream gaging funds; that certain water management employees be relieved of the 40 hr. work-week limitation; favoring stream pollution abatement; urging state governments to speed establishment of machinery to cooperate with federal agencies in consultation on flood control and irrigation projects; demanding Congress release impounded construction money; that the Bureau immediately release completed projects to water users therein for operation; against Valley Authorities; and that a study be carried out concerning the proposed policy of perpetual federal ownership of water use facilities.

Truman drops Authorities

The Authority issue was pretty well dunked in cold water during the Convention when a letter from President Truman was read, in which he appeared to withdraw his support from the proposition. He called TVA an experiment, praised the coordinated activities of the several agencies working on other streams, and emphasized that whether or not Authorities are desired should be decided by the people of a given region themselves.

Utah Engineer Favors Authorities

By ED. H. WATSON
State Engineer
Salt Lake City, Utah

IRRIGATION AND POWER development on the Colorado River is Utah's first and most important economic problem. Much of the irrigation will be costly and must be subsidized by the proper use of the river's hydroelectric power. In order to accomplish this purpose it will be necessary for the United States Government to generate, distribute and sell electrical energy; otherwise the people of the state will not receive the maximum benefits of the river's power resources. These results can be accomplished by an Authority, and in order to properly explain its function, I shall take the liberty to describe in brief the workings of the Tennessee Valley Authority, which has been in existence for thirteen years and has proved itself to be a great democratic institution operating for the benefit of all of the people of the Tennessee Valley and of the people of the United States.

Much false propaganda has been spread concerning Tennessee Valley Authority in which it has been charged with dictatorship, paternalism and encroachment on States Rights. In certain cases this propaganda strains the belief of the most credulous. I personally do not believe that these charges are supported by the facts. The governors of all seven states through which the Tennessee River flows are all on record that States' Rights have not been violated; in fact, they assert that the exact opposite is true. It is also fundamental that an Authority can have no more power than the Act creating it bestows upon it. It may be endowed with powers that are democratic or it may be given autocratic powers. Tennessee Valley Authority is an example of an Authority created by a very carefully worded act of Congress with great restrictions and limitations placed upon it. The three directors that determine its policy must live in Tennessee Valley, are under the direct supervision of Congress, and must report to that body annually.

Tennessee Valley Authority accounts are supervised by the Federal Power Commission and the Comptroller General, and all appropriations are made to it by Congress after the most careful scrutiny. It is a corporation clothed with the powers of government but possessed of the flexibility and initiative of a private corporation. It is democratic in that it cooperates with all federal, state, municipal and local agencies in its endeavors to promote the general welfare of the people. In fact, much of its policy emanates from the people themselves.

Its primary duties are to control navigation and floods and generate, distribute and sell electricity. On this latter function has been placed the burden of assisting the project to pay its costs and liquidate them. The Authority has aided greatly in winning the war. Among its peacetime duties will be the manufacture and distribution of phosphate fertilizer in order to better the agricultural system of the United States, the improvement of commerce, the establishment of recreation centers, the control of floods, the raising of health standards of the people of the valley and the spreading of the benefits of cheap electricity to all the people.

TVA power rates

The sale of cheap electric power and the profits derived therefrom permit it to reach out and raise the standard of living of the valley's population. This right to sell electric power at a profit has been upheld by the Supreme Court of the United States. Plants and the distributing systems of local operators were bought out for a price in excess of $100,000,000, which made it possible for the Authority to control prices and pass on the benefits of cheap electric power.

Here are some of the price schedules of TVA:

Schedule R-1 (Residential)—First 100 kwh, 2.0 cents per kwh; next 250 kwh, 1.0 cents per kwh; next 700 kwh, 0.4 cents per kwh.

What would such rates mean to the citizens of Denver or Salt Lake City?

Schedule A (wholesale power rates to state agencies, municipalities and corporations): Demand Charge—$0.90 per kw of demand per month. Energy Charge—First 100,000 kwh per mo., 4 mills per kwh; next 200,000 kwh per mo., 3 mills per kwh; next 700,000 kwh per mo., 2.5 mills per kwh; excess over 1,000,000 kwh per mo., 2 mills per kwh. TVA now furnishes three times the power for the same money as the private power companies did in 1933.

Tax payments

Section 13 of the Act provides that TVA shall pay equivalent amounts to the states in lieu of taxes. In 1944 it paid $2,168,798 to states and counties under this section of the federal enabling act.

Towns and cities of the area are rapidly building up cash reserves made from the profits of the sale of electricity. The following are the year's earnings after deduction of taxes in some of the cities served by TVA: Knoxville, $658,000; Chattanooga, $476,000; Memphis, $1,572,000; Nashville, $846,000.

Such data spells cooperation and confidence. In 1944 TVA paid $13,000,000 into the U. S. Treasury. It cooperates with the Soil Conservation Service in the program of establishing a new system of agriculture for the wornout cotton fields of the South and with the Forest Service in building parks and recreation centers. The Army Engineers operate the locks at the dams and the Bureau of Reclamation furnished the plans for Wheeler and Norris dams. TVA now makes and sells about one billion kwh of energy per month and is rated as one of the five largest distributors of electricity in the nation. It is claimed that it will return to the United States all power costs in 30 years and costs for flood control and navigation as well in 60 years.

Application to Utah

I have discussed Tennessee Valley Authority because it offers a plan for us in Utah to follow. The United States Government must generate, distribute and sell electric energy to the people of this state in order for them to receive the benefits of the development of the Colorado River. There must be no more Boulder Dam contracts where falling water is sold for a little over a mill per kwh of power generated.

The making of a cheap phosphate fertilizer is dependent on available cheap electricity. In the Colorado River Basin is known to exist the largest undeveloped deposit of phosphate rock in the United States. Its exploitation is imperative if we are to raise the agricultural standards of the nation—and this can be accomplished only if low-cost electricity is available.

Although vast deposits of excellent bituminous coal are to be found in the Colorado River Basin, there is no purpose in utilizing them to generate electricity when cheap hydroelectric power is available. An authority can develop all the resources of the basin for the benefit of all the people.

Utah is a sparsely populated state, a desert with an oasis here and there. Water is more valuable than gold and its conservation is a veritable religion. We must get the most out of it both for irrigation and power. It is necessary therefore that we plan carefully and act wisely in using the waters of the Colorado, for in this water as it tumbles along its turbulent course to the sea is the very secret that will touch the lives of our people. It will help them abolish poverty and drudgery, it will make them free, it will change the face of the earth on which they live, if they USE IT WISELY.

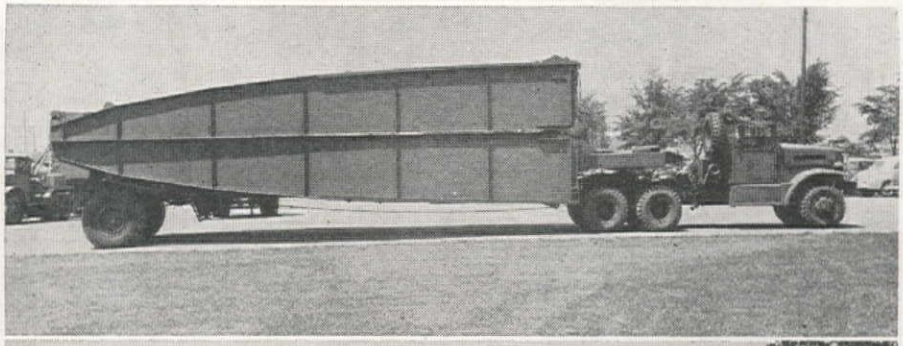
At the recent conventions of the Association of Western State Engineers and the National Reclamation Association, many speakers attacked the proposals for regional Authorities on all major stream basins. The only defense of the Authorities was made by Ed. H. Watson, State Engineer of Utah, who had just completed an inspection tour of Tennessee Valley Authority. Western Construction News is likewise opposed to the Authority proposition, but in the interests of fairness and a desire to present both sides of the discussion, requested of Mr. Watson permission to reprint that part of his annual report to the Engineers Association which dealt with the issue, and takes pleasure in presenting it herewith.

HOW IT WAS DONE

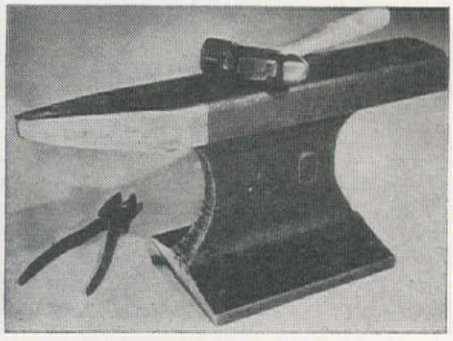
JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK

New Mobile Bridge Can Carry 35 Tons

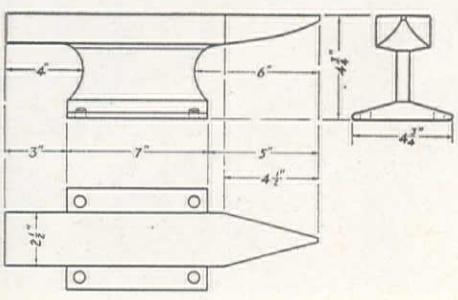
A MOBILE SELF-LAUNCHING bridge mounted on a single-axle semi-trailer has been developed by The Heil Co., Milwaukee, Wis., in cooperation with the U. S. Army Engineer Board. The bridge is a 13-ton aluminum plate-girder assembly which is hinged to fold at the center. The trailer is 51 ft. long and 9 ft. 4 in. wide, permitting the girders to straddle it. Height of the trailer when loaded is 13 ft. and the entire length is 63 ft. The bridge itself has a normal roadway of 9 ft. 6 in., but can be increased to 10 ft. 10 in. by hand gears. It can handle vehicles weighing 35 tons. Launching takes 6 men 15-30 minutes, and when operation is completed bridge will span a 70-ft. stream.



Anvil Cut by Blowpipe From Scrap Rail Ends



THE SERVICEABLE ANVIL illustrated above can be made from a short piece of scrap rail with a cutting blowpipe. This one, suggested by Linde Air Products Co., was cut from a 90-lb. rail in about 15 minutes. No finishing or grinding was necessary. The four holes were easily drilled in the base so that the anvil could be attached to a solid support. The holes could have been pierced with a blowpipe if a drill were not available.



Chisel Welded to Tractor Extension Trims Tunnel Ceiling and Sidewalls

A TRACTOR with heavy chisels mounted on a framework solved the problem of trimming the side walls and ceilings of two tunnels on the Deschutes Project, discussed on page 79 of this issue. The chisels replaced the dozer blade on the tractor and were operated by raising and lowering special arms used in place of the bulldozer arms. The forward movement of the tractor alone, without a vertical movement of the arms, was too severe for the texture of the tuff, since the work varied in hardness from one bed to the next.

Under these conditions the chisel point for the side walls was about 4 in. wide and was beveled on one side to make the point bite into the tuff. The point for the ceilings, illustrated at the right, was 2 in. wide and was used only to trim tuff projections.

Wixson and Crowe, Redding, Calif., were contractors for the tunnels. The Deschutes Project is a Bureau of Reclamation undertaking.

Artificial Respiration More Effective With Teeter Board

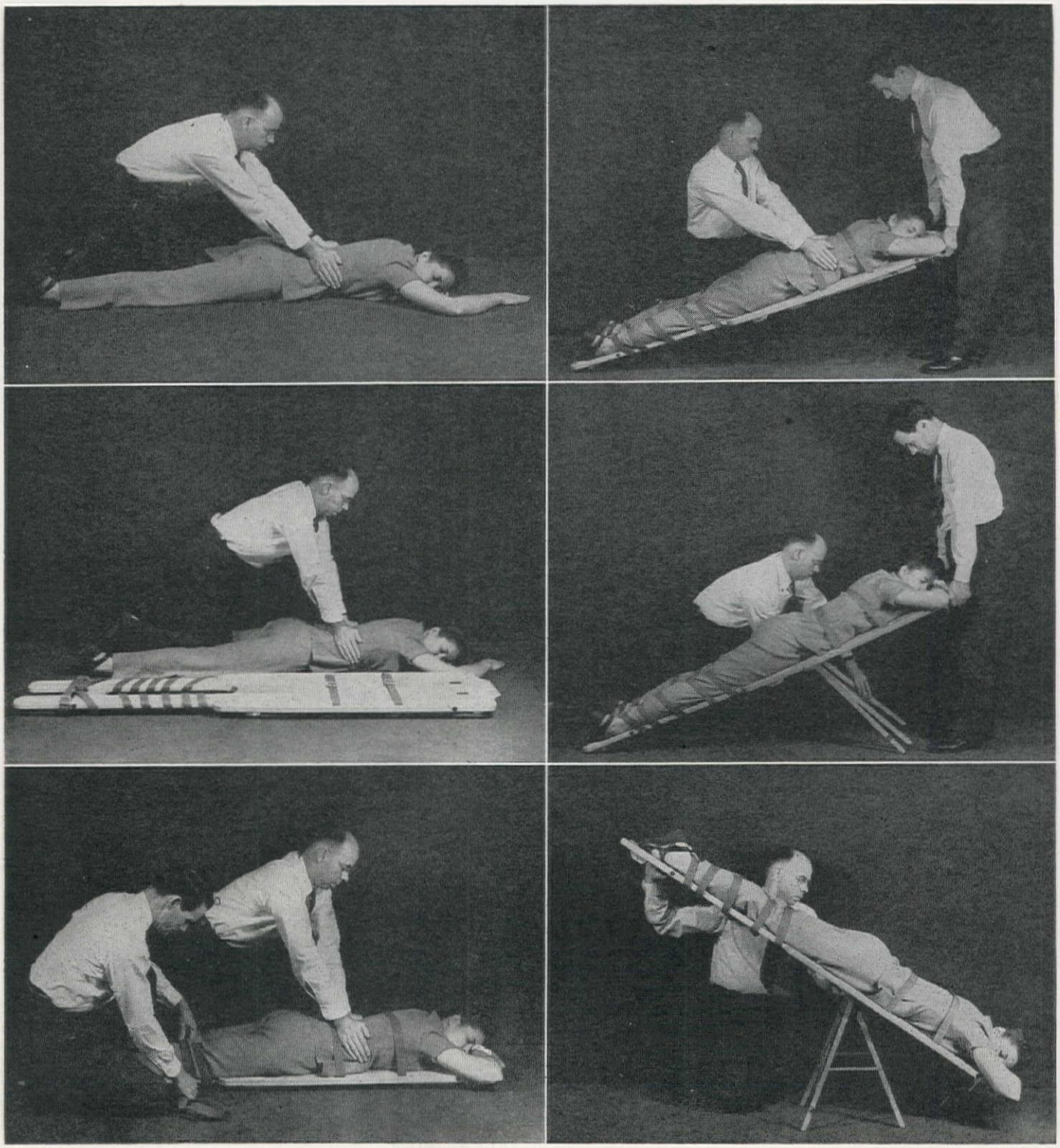
THE EVE METHOD of artificial respiration, developed by Dr. F. C. Eve, R.C.P., of Hull, England, has been adopted by the Royal Navy and recommended by the United Public Health Service. Dr. Eve proved by long experiment that there is nothing like the gentle rocking on a teeter board to bring a drowning man back to life. In this method the patient is strapped face down on a stretcher or improvised teeter board and gently rocked over a fulcrum through an angle of about 45 degrees. Like other methods of resuscitation it is important to maintain a constant rhythm of one complete rock every six seconds or ten cycles per minute.

The Eve method is equally effective for reviving patients suffering from gas poisoning or electrical shock. Dr. Eve found that the gentle rocking stimulates the flow of blood to the brain, which further aids the reviving person.

In effect, the abdominal organs of the victim alternately push and pull upon the diaphragm, thus acting like a piston to suck air into and expel air from the rescued man's lungs.

The Schaefer prone pressure method, illustrated in the first three pictures below, will remain a part of life-saving technique as the initial first aid applied or until a teeter can be improvised.

The accompanying photos showing the Eve method were furnished by E. D. Bullard Company, distributors of the illustrated teeter.



NEWS OF WESTERN CONSTRUCTION

DECEMBER, 1945

Oil Pipelines Across Panama Isthmus Nearing Completion

A $20,000,000 PIPELINE across the Isthmus of Panama to guarantee fuel for the U. S. Fleet in the Pacific, is nearing the last stages of completion, according to the Navy's Bureau of Yards and Docks.

The original purpose of the pipeline was to serve as a secret supply artery from the Atlantic to the Pacific, in the Canal Zone, should the Panama Canal have fallen victim to enemy action. Instead the pipeline, even in its earliest stages, proved so efficient and so strategically valuable, and the needs of the Fleet in the Pacific became so great, that capacity was more than doubled by building a duplicate pipeline even before the first was quite finished.

The entire project is now more than 95 per cent completed, the Bureau of Yards and Docks reports.

This new double-barreled pipeline, linking the two oceans, has a capacity of 265,000 bbl. of fuel oil daily, 60,000 bbl. of gasoline daily, 47,000 bbl. of Diesel oil daily. Much of its construction is so well covered with jungle foliage that spying cameras from the skies would be unable to trace its route.

The original conception of the pipeline took form in Aug., 1942, as the joint project of the Chief of Naval Operations, the War Department and the Petroleum Administration For War. The decision for its erection was reached at a secret meeting of some 20 officers of the Army and Navy, which delegated responsibility for its construction to the Chief of the Bureau of Yards and Docks. The meeting fixed the pipeline goals at a capacity of 105,000 barrels of fuel oil daily across the Isthmus, and another pipeline with a capacity of 35,000 barrels of Diesel oil or gasoline daily.

When this project was still under construction and sufficiently completed to have been already in use and of immense value, the Chief of Naval Operations, represented by Rear Admiral A. F. Carter, U. S. N. R., decided to broaden the original plan, in accordance with the growing logistical tables compiled on needs in the Pacific. It was decided to double the fuel oil capacity and lay still another line for gasoline only. The previously determined Diesel and gasoline pipeline would be used for Diesel fuel exclusively.

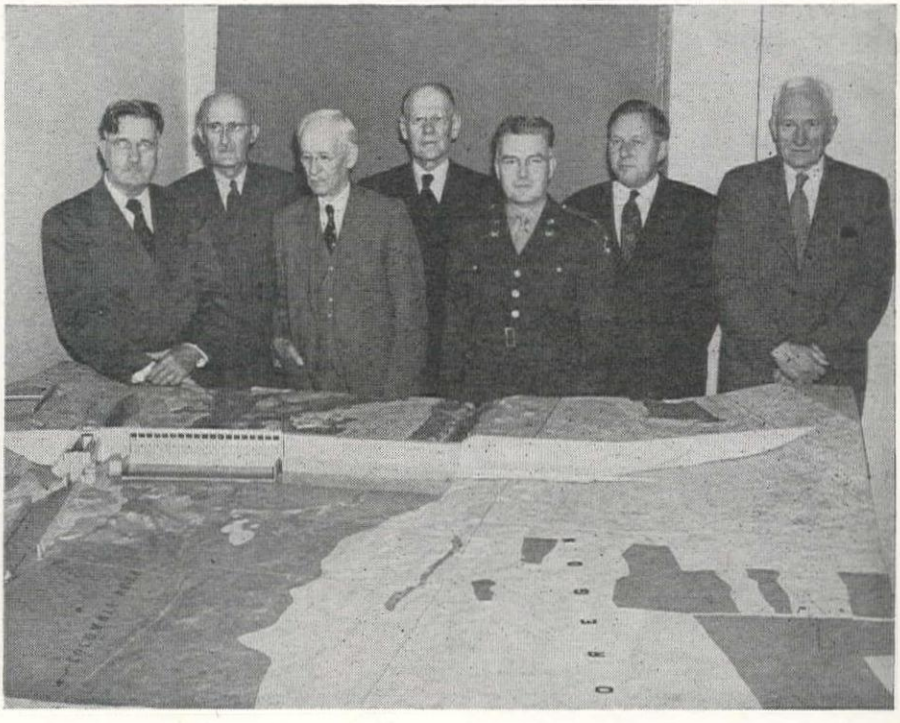
Thus there are two 20-in. fuel oil lines, one 12-in. gasoline line and one 10-in. Diesel oil line. The original pipeline was completed in Oct., 1943. But it had been in use months before its official completion date.

The Atlantic intake of the pipe line is at Cristobal, while on the Pacific side it terminates at Balboa. The line extends for 35 mi. between tank farms on either end, and then for about five miles from the tank farms to the shore, giving the project a total of some 46 mi.

The $20,000,000 cost includes the 46 mi. of pipelines, terminal facilities, piers, ballast water plants and pumping stations, the whole having been 95 per cent completed "or more" as of July 24, 1945. The work was done on Navy contract, by Williams Brothers Corporation, of Tulsa, Okla. The project, which comes within the area of the 15th Naval District, was supervised for the Bureau of Yards and Docks by a group of Civil Engineer Corps officers, under direction of Capt. Edward D. Graffin, Civil Engineer Corps, U. S. N., and Cmdr. John A. Scoville, Civil Engineer Corps, U. S. N.

CONSULTING BOARD STUDIES McNARY DAM MODEL

CONSULTING ENGINEER BOARD on the design of McNary dam, to be built on the Columbia River by the Corps of Engineers, below Pasco, Wash., includes, l. to r.: JOHN C. STEVENS, Portland, Ore., President, American Society of Civil Engineers; JULIAN HINDS, Los Angeles, Chief Engineer, Metropolitan Water District; CHAS. P. BERKEY, Palisade, N. J., Professor Emeritus, Columbia University; W. H. McALPINE, Washington, D. C., Office of Chief of Engineers; COL. RALPH TUDOR, Portland, Ore., District Engineer; O. J. PORTER, Sacramento, Calif., California Division of Highways; L. F. HARZA, Chicago, Ill., consulting engineer. The model is of McNary dam.



Bureau of Reclamation Preparing to Reopen Construction on Cascade Dam

THE BUREAU of Reclamation is making preparations for an early resumption of construction of Cascade dam, reservoir, and canal system which will benefit 110,000 ac. of land in southwestern Idaho, R. J. Newell, Acting Regional Director, has announced.

The first party of field engineers has begun field work and initial construction is scheduled for next spring. At the peak of activity about 500 men will be employed. The project will provide a full supply of water for 25,000 ac. of land near New Plymouth and Middleton on the Payette Division of the Boise Project and a supplemental supply for 85,000 ac. in the Emmett Valley which have been subject to periodic shortages.

Work was initially begun on the project in 1941 but was stopped in 1942 to divert critical materials to other wartime uses. The WPB restrictions were removed Oct. 15.

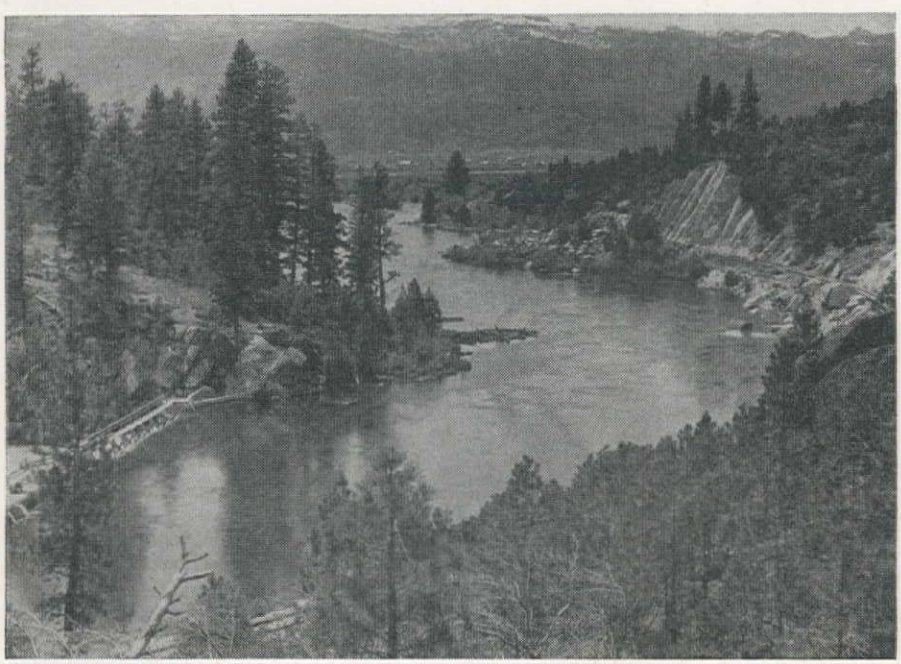
The Bureau proposes an early call for bids to complete the relocation of 14 mi. of the McCall branch of the Union Pacific Railroad, a portion of which would be inundated in the reservoir. This work was about half completed when the WPB halted operations. Approximately 20,000 cu. yd. of rock and 40,000 cu. yd. of earth remain to be excavated, 14 mi. of track laid, 40,000 cu. yd. of riprap and 27,000 yd. of ballast placed, and a new 100-ft. steel bridge erected.

The major item of the program will be the construction of the Cascade dam on the North Fork of the Payette River. Specifications show that this earth-fill structure will be 90 ft. high, 660 ft. wide at the base, and 860 ft. long at the crest. It will have a volume of approximately 368,000 cu. yd. with the reservoir storing 700,000 ac. ft. of water.

Approximately 11½ mi. of state highway, between the towns of Cascade and Donnelly, are to be relocated. The State of Idaho will prepare plans and specifications and handle the construction. This work is scheduled to begin next spring. Approximately 32 mi. of county roads are also to be relocated.

Construction of approximately 45 mi. of branch canal and approximately 250 mi. of laterals is to be undertaken under contract next April and May. The main pumping plant, having a capacity of 500 cu. ft. per sec., will also be constructed by contract, with the work scheduled to begin next April. The plant will lift the water supply for the 25,000 ac. of new land from the existing Black Canyon Canal of the Boise Project to the branch canal 90 ft. above. Work on the drainage system for the project will be initiated in the fall of 1946.

CASCADE DAM, Bureau of Reclamation's newest structure, will be built in Idaho on the North Fork of the Payette River, where this picture was taken. The left abutment will be near the smooth rock face in the upper right hand corner.



Reverse A-Bomb Process With New Atom Smasher

CREATION OF MATTER from energy—reverse of the process that occurs in the atomic bomb and that keeps the sun and stars shining—can be accomplished with radiation from a new atom smasher devised by General Electric Co., a device called a betatron which operates at energy of 100,000,000 volts.

Formerly thought separate entities, matter and energy are now known to be equivalent. Theoretically at least, as Einstein showed in his relativity theory, one may be changed to the other. In producing atomic energy the conversion from matter to energy is utilized. The reverse has been observed over a number of years in connection with studies of the cosmic rays and also of the rays from radium and similar radioactive elements. Since a small amount of matter corresponds to an enormous energy, very minute amounts of matter can be secured, even with the expenditure of huge quantities of energy.

This reverse process is called "pair formation." When high intensity x-rays pass close to the nucleus of an atom the ray, or photon, by some process not yet understood may cease to exist. Instead there is created a new electron and a positron, which is an electron with a positive instead of a negative charge. Very quickly the positron happens near some other electron; the positive and negative charges cancel and both disappear, producing radiation again. The new electron created in the pair has mass, like the positron, and it is therefore a unit of matter.

To produce a positron-electron pair, the x-ray photon must have energy of a little over a million volts. This would create a pair at rest. With higher voltages the pair has extra energy and higher velocity. Thus, the pairs formed with the 100,000,000-volt betatron are the most energetic ever produced by artificial radiation.

Kaiser Fontana Steel Plant Exports Billets to France

THE KAISER iron and steel plant at Fontana, Calif., has been awarded one of the first major orders received by an American firm for the industrial rehabilitation of France, it was announced recently.

The contract calls for 55,000 tons of semi-finished steel products and is the result of an aggressive postwar program launched by Kaiser Steel to develop new business for the West.

Kaiser Company officials said delivery would start immediately and extend over a four-month period. The contract was negotiated in Washington, D. C., with the French Supply Council Mission of Industrial Production.

The 55,000 tons of Kaiser Steel, which will be shipped to France in the form of billets, will be reprocessed into finished material upon reaching its destination. The order is part of a year-long purchasing program in this country by the French government.

Airlines Are Expanding To Serve More Cities

THE DOMESTIC AIRLINES of the United States now serve cities with one-third of the nation's total population and 76 per cent of the urban population, according to a survey by the Air Transport Association of America.

A report points out that within a 25-mi. radius of the routes certificated to date by the Civil Aeronautics Board live 82 per cent of the urban population, while within a 50-mi. radius live 93 per cent.

The certificated stops have reached a total of 406, of which 315 are in use,

while most of the rest are being readied for service after suspensions due to various wartime causes. Other highlights of the report, indicating the growth of the air carrier network, are:

Only 52 cities of over 25,000 population not now served by the airlines are situated more than 25 mi. from an airline stop. The airlines have already applied to serve many of these. The latest tabulation shows 542 applications for scheduled domestic service before the Civil Aeronautics Board. Of these, 415 were of the conventional type, 48 pick-up service and 79 helicopter.

A CAA study estimates that 380 cities which might be added to the network would be within 10 mi. of the center line of an existing airway. Such stops would serve 58,000,000 of the entire urban population of 74,000,000.

Canadian Construction Firm Buys Tourist Area

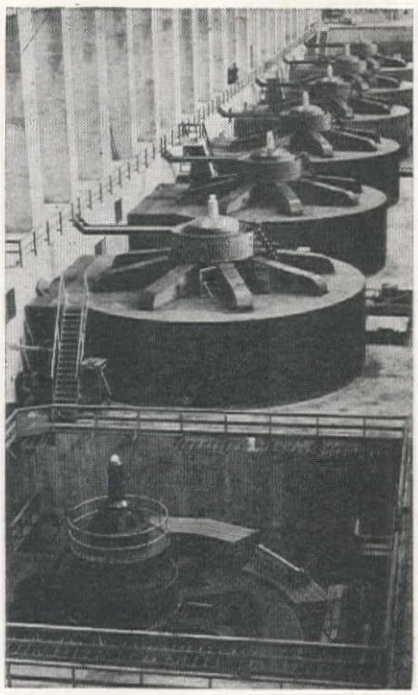
MARWELL CONSTRUCTION CO., Vancouver, B. C., has entered a new field of activity by purchasing the summit of Grouse Mountain, including the chalet, for $75,000, from North Vancouver municipality district. It is planned to turn the mountaintop into a year-around tourist center and to spend approximately $500,000 on the development of the area.

The present chalet will be reconditioned and operated for the exclusive use of skiers and hikers, while a new and much more elaborate chalet will be erected. Deluxe cabins, swimming pool, tennis courts, riding stables, bowling greens, putting greens, sunken gardens, and bridle paths are all planned in connection with the project.

H. A. Martin, executive vice president of Marwell Construction Co., stated it was planned to develop Grouse Mountain so that it would cater to the requirements of all types of individuals so that everyone would be encouraged to make use of the mountain playground. Also, he intimated consideration was being given to a funicular railway, at a later date.

Engineers of the construction firm are already at work surveying the road from the toll gate, with a view to widening it and eliminating some of the cutbacks and curves now existing.

A regrettable omission occurred in connection with an article which appeared in the October issue of Western Construction News. This was an article on construction and testing of heavy barge-cranes at the shipyard of Bellingham Iron Works, Bellingham, Wash. These huge barges were designed and detailed in the offices of the Dravo Corp., Pittsburgh, Penna., and no mention was made in the article of that company's contribution to the project. Also the lead picture in the article was furnished by Dravo Corp.



TWO GENERATORS borrowed from the powerhouse at Shasta dam for wartime use at Grand Coulee soon will be replaced with 108,000-kw. units. One of the loaned 75,000-kw. machines shown in line with the larger Coulee units.

OBITUARIES . . .

Henry E. Schraven, 65, Salt Lake City contractor, who built many of the city's largest buildings, died there October 15 following a heart attack. He was president of the H. E. Schraven Contracting Company. Schraven's firm constructed the Salt Lake public library and a number of public and industrial buildings around Salt Lake. He was past president of Associated General Contractors of America, Intermountain Branch.

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Lt. Col. Martin A. Higgins, 54, former post engineer at the AAF Overseas Replacement Depot at Kearns, Utah, died in Denver, Colo., Nov. 3. Before going into active duty in 1940, he was architectural engineer for the Chicago and Northwestern Railroad, Chicago, Ill. During his army service he was supervising architect for the construction of Kearns, area engineer in the construction of the Utah Ordnance Plant and chief engineer for the Kankakee Ordnance works, Joliet, Ill.

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William J. Tobin, 75, well-known Oakland, Calif., highway and heavy construction contractor, died recently. He was a member of the Northern Calif. Chapter of the Associated General Contractors of America.

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Fredrick Hall Fowler, 66, prominent engineer, died Nov. 7 in Palo Alto, Calif. He was a former president of the American Society of Military Engineers. Fowler served as consultant for the Grand Coulee and Bonneville dams and was consulting engineer for the Federal Power Commission. During World War II he was chief consulting civil engineer to the chief of Army Engineers in Washington, D. C.

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A. Eugene Christensen, 54, one of Utah's most prominent contractors, died from injuries as a result of an accident while horseback riding. He was a partner in the W. E. Ryberg Construction Co. and president of the Intermountain branch of the Associated General Contractors of America in 1931. He supervised much construction at the Geneva Steel Plant and the Wendover Army Air Base.

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William F. Pigg, 81, retired Denver, Colo., building contractor, died in Denver on Nov. 5. He constructed many private homes throughout the state as well as building several apartment houses, bridges, schools and highways.

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Col. Willis C. Bickford, 59, general manager and chief engineer of the Port of Seattle, Wash., died suddenly Nov. 4. He served as president of the Seattle Construction Council for some time.

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Thomas B. Doner, former city engineer of Alhambra, Calif., died recently in Reno, Nev. He had been active in construction and engineering work in the West for more than 25 years.

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Albert Burton Holt, 86, pioneer Whittier, Calif., and San Fernando Valley building contractor, died Nov. 6. He was the retired owner of A. B. Holt Building Construction Co.

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Lynn O. Newcomb, 49, Los Angeles, Calif., building contractor, died Nov. 1.

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Charles B. Post, 85, former Denver, Colo., building contractor, died Nov. 1 in Arvada, Colo. Mr. Post constructed more than 300 fine homes in Denver and was responsible for introducing Spanish type of architecture in that city.

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Thomas Freeland, 52, an employee of Piombo Bros. Construction Co., San Francisco, Calif., was killed when a steam shovel he was operating overturned on him. The accident occurred Oct. 29.

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William J. Watson, Pasadena, Calif., contractor, died suddenly Sept. 15. He had been in the contracting business for 30 years.

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Frank Dillon Maxwell, 71, former deputy U. S. surveyor, died Nov. 1 in Boise, Ida. Before retirement he was connected with the General Land Office.

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William A. Hoover, 82, retired Provo, Utah, contractor, died Oct. 11 at his home following a two-day illness.

WASHINGTON NEWS
. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—The most recent and last summary of war supply contracts and facility projects, issued by the War Production Board Statistics Bureau before it quit, reports that the eleven Western States of the Pacific slope produced for war from 1939 to July, 1945, a gross total that cost the Federal Government $33,282,332,000. This represents about one-seventh of the over-all national aggregate amounting to $237,102,359,000. This huge sum does not include the expenditures of the Federal Government in the West that go on despite war or peace. Nor does it include the vast sums spent by the Armed Forces out of their pay, and by their relatives and others who came West with the soldiers and sailors. And the summary obviously does not include the great expenditures made by Eastern private corporations in the West. It also is interesting to learn that the WPB Statistics Bureau regards the total as net, reflecting all decreases due to contract cancellations and reductions. The total comprises expenditures by Army, Navy, Maritime Commission, Defense Plant Corporation, Reconstruction Finance Corporation, and British Empire governments, as well as other foreign contracts.

By States the total is broken down thus: Arizona, $2,152,229,000; California, $20,662,935,000; Colorado, $736,008,000; Idaho, $146,791,000; Montana, $79,975,000; Nevada, $281,693,000; New Mexico, $167,722,000; Oregon, $2,022,506,000; Utah, $586,787,000; Washington, $5,935,304,000; Wyoming, $115,325,000. In Arizona, Maricopa county was by far the principal beneficiary. In California the bulk was expended in Los Angeles area, with the San Francisco Bay region the recipient of less than one-third of the sum spent in the Los Angeles region; and with San Diego one billion dollars behind the San Francisco Bay region.

Colorado river basin

The preliminary program for developments in the Colorado River basin is presumably still hush-hush because the study has been sent to the governors of the seven states for the counsel and judgment required by law under the amendments to the Flood Control Act of 1944. Obviously, citizens who have reasons to be concerned, may study the preliminary report by requesting an opportunity to examine it in their respective state capitals. In due time, probably with some sharp changes, the report will be published for the inspection of the general public.

Much current activity of the Bureau is focused on the effort to solve the problem of putting water on the acres in central Arizona. The hearings held in Arizona in August have produced a special report, which, however, does not seem to be satisfactory to Congressman John R. Murdock, as spokesman for the people in Arizona. He has spent some time needling the Bureau to move it to work out a plan by which benefits might be obtained in the state through the cooperation of the Bureau of Reclamation, the Office of Indian Affairs, and the National Park Service.

Most of the Congressmen on the Reclamation and Irrigation Committee of the House fear that the Bureau of Reclamation, and other interests, are using the Federal Government to build up a vast reservoir of power-production resources, together with transmission lines; and that they intend to use land development as the cloak to cover the plan to secure power that may be sold for almost nothing to further the well-known socialization ideas of Mr. Ickes' young men in the Department of Interior. These fears recently have caused the members of the Appropriations Committee to hesitate to approve of the emergency funds needed to go ahead before the regular budgetary dispositions are made available next July. They are not merely bothered by the pressures from the private utilities, which are normal and expected, but they fear that the taxpayers in the populous East will strenuously object to the use of Treasury funds to build power resources to give the Western people light and energy for next to nothing, and to socialize certain functions of economics for special groups of people in the West.

Original LaRue plan

It is interesting that Congressman Murdock reverts to the plan proposed by E. C. LaRue, the original pioneer in exploring the water resources of the Colorado Basin. LaRue, an engineer of the U. S. Geological Survey in the early part of the century, almost single-handed, and almost on his own time and expense, went out into the Colorado desert country, upper, lower, and tributary basins, and with incredible toil assembled the data which were published by the Geological Survey, and became the first historic assembly of facts and conclusions upon which subsequent surveys were expanded. LaRue suggested a number of innovations which since have been adopted and attributed to others; he suggested a high dam at Lee's Ferry, which suggestion was derided because he thought it might be possible to blast the rock cliffs on either side, and use the detritus as a rock-fill for the proposed dam.

Congressman Murdock joins in the derision of a quarter century ago about the blasting of the cliffs, but makes use of LaRue's idea for the high dam. The Congressman definitely does not believe in the tunnels from Marble Canyon to Kanab Creek, with a price tag of $344,000,000; and it is interesting again that he apparently adopts the idea of a high-line canal which was originally proposed over a quarter century ago by George Hibbard Maxwell, the really grand old man of water and reclamation in America. Maxwell is the Father of the Reclamation Bureau, although the Reclamation Bureau people carefully do what they can to forget it; and he is the original creator of the National Reclamation Association, which the Association eagerly acknowledges.

Here is the idea Congressman Murdock proposes for the high-line canal: he would follow LaRue's plan and build the highest possible dam at Lee's Ferry. With an artificial lake at a level of 4,000 ft. above the sea, he would lift the water another 1,000 ft., and from the 5,000-ft. level he would bring the water down to the Hopis and the Navajos and to the lower valley of the Little Colorado River, crossing somewhere between Holbrook and Winslow, terminating south of Winslow where the mountain wall "could be tunneled into the Salt River system." Most of the water, destined for central Arizona, would be delivered at a point above Granite Reef Diversion Dam for distribution. The water passed through the mountains would require a tunnel of 60 mi. or less. The Congressman urges his plan is better than the aqueduct proposed by the Reclamation people from Cunningham Wash to Granite Reef, because there is less tunneling, and would put under water 100,000 additional acres with an economic value of $20,000,000.

Reclamation Bureau plans

This prospective undertaking, plus the numerous and extensive irrigation and reclamation projects ahead, has made the choice of Commissioner Bashore's successor a very troublesome problem to the members of the Irrigation and Reclamation Committees of the House and the Senate, as well as to Harried Harold and his bright young men of the Department of the Interior. Many names have been mentioned, but at this writing none have received serious consideration. It still seems probable that Goodrich Lineweaver, now Assistant Commissioner of Reclamation in Charge of Operations and Maintenance, will be designated as the interim Acting Commissioner.

Mexican treaty signed

The Secretary of State and the Mexican Ambassador exchanged the instruments of ratification of the Mexican water treaty on Nov. 8. The President had signed the ratification on Nov. 1. The Mexican President had signed the treaty on Oct. 16, after the Mexican Senate had approved the treaty on Sept. 27. The treaty became actually effective on Nov. 8. The witnesses at the State Department were Rep. Sol Bloom, chairman of the Foreign Relations Committee of the House, and Senators Sheridan Downey, Joseph C. O'Mahoney, Eugene D. Millikin, Warren D. Millikin, and Tom Connally. Present also were a number of officials of the Department of State, of the Mexican Embassy, and the two members of the International Boun-

dary Commission, Lawrence M. Lawson representing the U. S., and Rafael Fernandez MacGregor, for Mexico. Assistant Secretary Mike Strauss, and Reclamation Commissioner Harry W. Bashore, represented the Interior Department. There was the usual florid exchange of felicitations.

In the House, previously, however, Rep. Harry R. Sheppard, of California, drew attention to the fact that the Mexican interpretation of the treaty was diametrically different from the understanding transmitted to the Senate by the Department of State. State Department emphasized that we were under no obligation in regard to the quality of water delivered to the Mexicans; the Mexicans in precise words reported they had been guaranteed water of good quality, and that we must deliver the water except under conditions of extreme drought, "and only if that extraordinary drought should bring about the reduction of all consumptions in the United States." On the day the ratifications were exchanged Sen. Downey filed with the Secretary of State a letter in which he pointed out that the negotiators for the United States had not reported to the hearings an interpretation which is consistent with the understanding reported by Engineer Adolfo Orive Alba, Executive Chairman of the National Irrigation Commission of Mexico, in a letter to *Western Construction News* published in the August issue; and he emphasized that the unclarified ambiguities will cause the development of the Colorado River to be adversely affected. The members of the House also pointed out that certain appropriations are pending to effectuate the terms of the treaty, and that the ambiguities should be clarified before the appropriations are passed.

Construction prospects

Private utilities will spend for construction $800,000,000 in 1946; public construction is estimated at $2,000,000,000, by the Construction Division of the Department of Commerce; and military, naval, and similar construction is estimated at $200,000,000, for the same period. (It was $1,200,000,000 this year.) Highway construction is forecast at $800,000,000 for 1946, and sewer, water, conservation, and development expenditures are estimated at $600,000,000. This aggregates for over-all heavy construction approximately $4,400,000,000 for 1946.

Home construction in 1946 is estimated at $2,000,000,000; industrial construction, $1,200,000,000, which the Commerce commentator calls an all-time high. Repairs and maintenance are estimated at $5,000,000,000. Over-all private construction expenditures are calculated as representing three-fourths of the total for all construction. In addition to industrial building it is predicted in 1946, $850,000,000 will be spent on hotels, stores, theaters, warehouses, and similar structures.

Total new construction during 1945 is estimated at $4,400,000,000, over 10 per cent higher than in 1944. Publicly financed construction dropped from 17 to 66 per cent according to the type of work. The least decline was in highway building, the highest in public industrial construction. Lumber continues critical and no promises are made for relief.

OPA Regional directors were authorized on November 5, under Amendment 1, General Order 68, to delegate power to subordinate district heads to establish dollars and cents prices on essential building materials.

Surplus war materials

CPA, the successor to WPB, urges the construction industry to secure much-needed material from war surplus property now available. This advice is well meant but involuntarily misleading. Federal Government agencies and subdivisions and states, counties, cities, towns, irrigation districts, and similar political subdivisions, as well as public institutions, are able to secure surplus with relative speed, after it is located. These groups now have a well-defined series of priorities. There are also some 500,000 or 1,000,000 priorities, in theory, for smaller business units and veterans. But in effect these priorities are perforce ignored; they are not practical in operation and application.

Private industry often finds the procurement of surplus so tangled and bewildering, and often finds surplus in such condition that its purchase is uneconomic from almost every standpoint. For example, 5,000,000 or 6,000,000 shotgun shells were offered for sale for use by duck hunters. The purchasers found the shells contained buckshot. Unused "new" wire was offered to various users. The purchasers found it rusted and mostly useless.

The head of one surplus disposal agency reports Army surplus comes from 15,000 different places. He suggests to avoid mistaken disposal of buckshot shells and rusted wire, two inspectors should be on duty full time at each place. This means 30,000 employees, not fiscally available. Moreover, Army has no facilities to sort or pack surplus materials. This would mean more employees for which the surplus disposal people have no funds. But without such help there is always the chance that there may be a repetition of the sale of 500,000 pairs of shoes which came unassorted as to mates and sizes, and unpackaged. The whole surplus situation is literally an ungodly mess, not by reason of any lack of effort of the officials in charge to make it work, but because Congress was so afraid of scandal, political shenanigans, and various types of finagling, that it tied the whole system of disposal up with so many restrictions that it absolutely cannot be made to work properly.

The honest opinion here, when expressed in high quarters (safely guarded from quotation), is that all purposes would be best served if most of the so-called surplus could either be reduced to scrap, or taken into both oceans and dumped at the deepest parts. The war surplus has either been used and has served the purpose for which it was made, or, if "new" and unused, has deteriorated, and has served its purpose by its sheer existence. Obviously, the small percentage which is useful, and which can be economically distributed with profit to the users, and without disturbing the economy, should be utilized.

Miscellaneous

John L. Haynes, the new Chief of the Construction Division of the Department of Commerce, says to reach a high construction total the industry must give the consumer more for his dollar, and must pay wages substantially higher than is paid in industrial plants. His

LATE WIRE

MIKE STRAUS, Ickes' favorite assistant interior secretary, spent half an hour with the President the other day, giving vitality to Ickes' known hope that he be appointed Bashore's successor Jan. 1 as Reclamation Commissioner. After Straus, Dr. Raver of Bonneville is most frequently mentioned, but he would have more opposition in Congress . . . Navy Secretary Forrestal planned to resign Jan. 1, and word is Edwin A. Pauley, now in Japan, was to succeed him. Army-Navy merger, however, not expected to be settled until next spring, and Forrestal may have to stay to see it through . . . Former Governor Charles G. Gossett, of Idaho, has been sworn in as Senator to succeed the late John Thomas. . . .

Twenty-two millions were clipped from Reclamation's ninety-nine millions recommended by House Committee, including five million from Davis Dam, leaving five; $1,800,000 power line from Phoenix to Tucson was deleted; in Central Valley, $730,000 was voted for transmission line from Oroville to Sacramento, specifically for irrigation works in the Delta region; two amendments to the deficiency act, designed to commit Congress to support building network of transmission lines were voted down in House.

Land grant fantasy law finally sent to White House as repeal of that part of 1940 Transportation Act which compels railroads to charge 50 per cent rates for military and navy traffic to be effective Oct., 1946 . . . McFarland amendment providing $68,000,000 to settle veterans on Western lands was deleted . . . Federal airports aid entangled in Senate and House scraps, no solution in sight.

Issues which Labor-Management conferees could not solve are regarded here as grass roots issues which are key to expanding strikes . . . Steel and electrical workers expected to strike in January . . . Business in East generally slowed, even among farmers, waiting until new tax effective in January...Murray Small Business committee will visit San Diego in January to study the most typical city in reconversion purpose.

mind seems to run to the idea that the average construction worker should get an **annual** wage of $1,500, to compensate for the bad weather periods. His frequent official opposite, OWMR Director John W. Snyder, recently told Congress the number of contractors engaged in construction had fallen from 500,000 four years ago to 140,000 at present. Snyder also emphasizes, every time he gets the chance, that inventories of construction materials must be strictly controlled through inventory regulations, keeping procurement to current needs.

Administrator Fleming of Federal Works Agency has recently broadcast an urgent suggestion that the states and communities make more use of the $17,500,000 provided by Congress to plan and make blueprints; and he intimates Congress may provide $107,500,000 more for the same purpose, if the interest is sufficiently lively. Streets, sewers, water supply, hospitals, airports, and similar public facilities are particularly encouraged. FWA expects shortly to obtain an appropriation from Congress of $193,000,000 for federal buildings outside of the District of Columbia.

The Senate Committee on Education and Labor has recently recommended that $75,000,000 be spent annually for five years to build additional hospitals and extensions of existing hospitals. The job is to begin with $5,000,000 to survey and plan. Planning money would be provided on the ratio of population of a state to the total population of the United States; and the allotment of facilities would be made on the basis of construction needs, as related to per capita income.

Charles Upham of the American Road Builders Association recently announced Chile is blasting a 2-mi. tunnel through the Andes to shorten the highway between Valparaiso and Santiago. Chile will spend $1,000,000 a year for the next six years on highway construction and equipment. At least $5,000,000 will be spent on equipment. Ecuador plans a similar disbursement for the same purpose.

Vincent P. Ahearn, secretary of the National Sand and Gravel Association, was appointed by the President a member of the War Labor Board; Jesse E. Stanton, San Francisco architect, has been advanced from the office of PBA Division Engineer in San Francisco to the post of Deputy Commissioner of PBA in the Capital with special portfolio for Design and Construction.

Veterans in Hawaii, the Marshall Islands, the Marianas, Tokyo, and elsewhere in the Pacific, will be visited by a delegation representing the Associated General Contractors of America, National Association of Manufacturers, American Federation of Labor, Congress of Industrial Organizations, Veterans' Administration, and United States Employment Service, who will hold a series of forums to discuss employment opportunities for the veterans. The GIs will be told about present status of reconversion, veterans' re-employment rights, jobs in the United States and elsewhere, what is being done for veterans, and any other subjects the soldiers and sailors may wish to know about.

S. J. Res. 105, companion to H. J. Res. 265 and 267, reported out of the Senate and House Committees, provides that the government agencies in charge shall proceed with river and harbor projects delayed by the war, despite the prohibition that no appropriation shall be made, or construction undertaken, until six months after the official termination of the war. Apparently a similar resolution will be recommended to speed up flood control projects.

VERY IMPORTANT!!

It is noteworthy that the Federal Register of Nov. 1, devoted to major Orders and Directives of the Federal Government, including the President's Executive Orders, published daily in the Capital, contains virtually a page of type, issued by the Secretary of the Interior, defining the regulations which apply to the presence of dogs in Boulder City, Nev. If a dog is over three months old, unfenced or not kept within a home, it must have "substantial collar" with a license tag issued during January each year upon application to the City Clerk with $3 for a male dog, $6 for an unsterilized female dog, and $3 for a sterilized female dog.

Speaking of Employment . . .

PERSONALLY SPEAKING

R. H. Corey, consulting engineer, has been commissioned to make surveys and prepare plans for relocation of 22.7 mi. of Southern Pacific Railway trackage between Jasper and West Fir, Ore. The work is estimated to cost $8,000,000 and is a prerequisite to construction of the proposed Meridian dam in Oregon. Corey will direct the work from Portland and Springfield, Ore., offices. Chief field engineer for the survey is **A. E. McKennett. Carl Blakely** is his assistant engineer and **O. P. Dexter** is the Springfield office engineer. Construction will begin when Congress appropriates the funds for the Willamette Valley basin project.

* * *

Graeme K. MacDonald, Dallas Young and **C. Edward Nelson** have announced the formation of a new firm, MacDonald, Young and Nelson, with headquarters in San Francisco, Calif. They are general contractors and will specialize in building and heavy construction. The firm of MacDonald & Kahn, Inc., will be liquidated Jan. 1st. Graeme MacDonald was one of the partners. In the old partnership Young was field representative for 20 years and Nelson was engineer and estimator.

* * *

Major Paul L. Nichols, Corps of Engineers officer, has received his honorable discharge from the Army and is returning to his former occupation as bridge designer for the state highway department in Reno, Nev. Before entering the service he had been with that department for eight years. In 1942, when he went into active service, he was assistant training officer of the engineer replacement center at Ft. Leonard Wood, Mo. He was assigned next as cadre officer at Camp Abbott, Ore. Just before his discharge he was assistant director of training at Ft. Lewis, Wash.

* * *

Axel O. Olson, manager of the bureau of light, heat and power, has been appointed to the post of general manager and chief engineer of the Hetch Hetchy water supply and power system, San Francisco, Calif. **James H. Turner** previously held the position but has recently been named manager of utilities, succeeding **Edward G. Cahill.** Olson first entered the city's service in 1926 as an assistant electrical engineer. He was in charge of street and building lighting for the public utilities commission from 1936 to 1942. He became general manager and chief engineer of that department in 1942.

* * *

Rodney Ryker has been appointed supervisor of hydraulics in the Department of Conservation and Development for Washington, replacing **Clarence Shain,** new director of the Washington State Highway Department. Ryker was formerly Okanogan and Kittitas County engineer and a state highway employee. Shain, who held the hydraulics post only since September, accepted the highway position when **Clarence Hickey** died.

* * *

Gerald E. Arnold has been appointed assistant city manager of San Diego, Calif. Recently he has been on the War Production Board as a coordinator between that agency and western public utilities, mainly

A. H. HARDING, formerly personnel manager with Chemical Construction Co., during erection of the aluminum plant at Salem, Oregon, has been named Manager of the Portland Chapter of Associated General Contractors.

water utilities. In his new position he will supervise San Diego's water system. During the war Arnold was commissioned a Major in the U. S. Public Health Service and later became a Lieutenant Colonel. Before the war he was chief water purification engineer for the San Francisco, Calif., Water Dept.

* * *

Lt. Hanen H. Williams recently returned from 21 months in New Guinea and the Philippines, where he served as engineering officer with the 102nd Naval Construction Battalion. He has been given the Bronze Star Medal "for meritorious service as planning officer in connection with the layout and construction of the U. S. submarine base at Subic Bay, Philippine Islands." Before joining the Seabees in 1943 he was chief surveyor for Crocker and Ryan on the construction of the Army Air Base at Peterson Field in Colorado Springs, Colo.

* * *

Everett L. Clark recently joined the staff of the Donald R. Warren Co., Los Angeles, Calif., as a hydraulic engineer. In the past 22 years he has gained wide experience in water supply engineering. He has made studies for the Central Valley Project and the "South Coastal Basin Investigation" in California. After eight years with Division of Water Resources of the State of California he joined the Calif. Railroad Commission. In his present position he is working on plans for two dams—one on Matilija Creek and the other on Coyote Creek, Calif.

* * *

Major John S. Detlie, Corps of Engineers officer, will be transferred to the San Francisco, Calif., district of the U. S. Army Engineers. He will be in charge of an office for the study of results of bombing in the Western Pacific. In 1942 Detlie was in charge of camouflage for the Seattle, Wash., district and designed and directed camouflage of Boeing Field, Boeing Plant and other Northwest installations. He served as control officer, personnel officer and head of military design for the Seattle Army Engineers in recent years.

* * *

Walter P. Plett has been named Administrator of the Eighth Region (Alaska) of the Civil Aeronautics Administration. He succeeds **Marshall C. Hoppin,** who resigned to join Alaskan Airways. Plett previously was superintendent of airways and directed the construction of CAA and Army airports which played such an important part in the defense of Alaska. In 1939 he was Senior Airways Engineer and Assistant Superintendent of Airways there.

* * *

John W. Daugherty, professional civil engineer, is managing the newly-organized firm, Daugherty Engineering Services, Spokane, Wash. The firm is offering engineering and consulting services in the fields of civil, structural, electrical, hydraulic, mechanical and industrial engineering. Associated with Daugherty are **Laurence M. Smith,** professional electrical engineer, and **Kendall M. Wood,** professional mechanical engineer.

* * *

Vice-Admiral J. J. Manning, Director of the Eastern Pacific Division of the Bureau of Yards and Docks, San Francisco, Calif., took up his new position as Chief of the Navy Bureau of Yards and Docks in Washington, D. C., on Dec. 1. He is succeeding **Vice-Admiral Benj. Moreell** who held the post for eight years. Moreell relieved **Admiral S. M. Robinson** as Chief of the Materials Division in the Office of the Assistant Secretary of the Navy. Robinson will retire on Jan. 1st.

* * *

Relieved from duty in the realignment of the Washington State Highway Department are: **Henry Porak,** work control engineer, with about 30 years' service; **Norman Hill,** maintenance engineer, with 20 years' service; **L. R. Turnbull,** personnel officer and in charge of the merit rating, 26½ years' service; and **George Mason,** district engineer in the Olympia, Wash., district, 24½ years' service.

* * *

R. C. Stange is now assistant general manager in charge of the San Francisco, Calif., office of the National Board of Fire Underwriters. For several years he was structural and fire protection engineer in that office. In 1940 he was transferred to the head office in New York as a consultant on building codes. At the outbreak of the war his services were loaned to the Bureau of Yards and Docks and later to the Coast Guard.

* * *

Glen Smith is manager and **John MacLachlon** is chief of construction for the new branch of the General Engineering Co., Ephrata, Wash. Both this branch and the Seattle office offer complete civil, structural, mechanical, surveying and engineering services. The Ephrata division is serving the area around the Columbia River Basin development.

COL. GEORGE MAYO

Col. George Mayo has assumed duties of District Engineer for the San Francisco, Calif., District, U. S. Engineer Dept. He succeeds **Col. Kenneth M. Moore** who has been transferred to Duluth, Minn. Col. Mayo joined the Corps of Engineers in 1916 and has seen foreign service in the Hawaiian Islands and the Panama Canal Zone. He has been District Engineer for the Portland, Ore., District, Chief of the Construction Section in the Office of the Chief of Engineers, Washington, D. C., and Chief Engineer of the Army Air Forces. While in the Panama Canal Zone he was Chief of the Caribbean Defense Command and later Division Engineer of the Panama Engineer Division.

* * *

Lt. Col. Ernest E. Foulks, who was superintendent of the Albuquerque Division of the Santa Fe Railway at Winslow, Ariz., before joining the armed forces, has been appointed Superintendent of Transportation of the Santa Fe Railway at Chicago, Ill., headquarters. During the war he organized and directed reconstruction of rail facilities at the Port of Naples and at Casoria, Italy. He received the Legion of Merit for his outstanding service.

* * *

Twenty-one Spokane, Wash., men have taken state examinations and have received licenses as registered professional engineers. They are: **James G. McGivern, Ivan A. Shirk, Robert E. Tobin, Francis R. Curran, John W. Daugherty, Walter Z. Davis, John F. Gogins, Fred M. Goldsworthy, Albert Gruber, William A. Heineck, Delbert A. Kelly, Charles J. Melrose, Charles V. Payne, Riley R. Preator, Roy W. Rydell, Willis C. Sander, Laurence M. Smith, Howard A. Stingle, Herbert L. Wilson, Kendall M. Wood** and **Walter L. Woodward.**

* * *

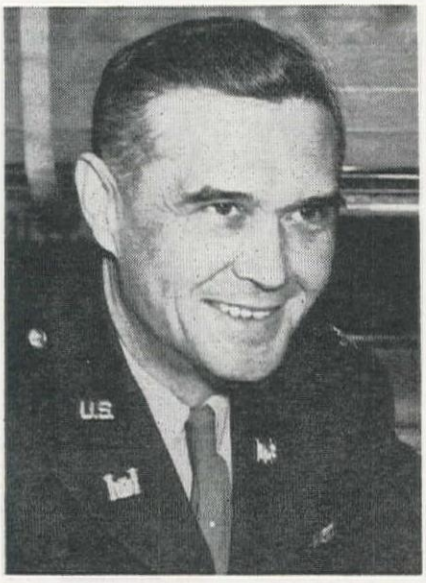
S. T. Larsen is now serving as superintendent of the Bureau of Reclamation Belle Fourche project in western South Dakota. He succeeds **F. C. Youngblutt,** who retired on Nov. 1. Larsen has been with the Bureau since 1934 and had been employed in the branch of operations and maintenance at the regional office, Billings, Mont., prior to his new appointment. Youngblutt had been with the Bureau almost continuously for 38 years. He joined it in 1907 and spent a number of years on the Lower Yellowstone project. He was appointed superintendent in Belle Fourche in 1924 and held that position until his retirement.

* * *

Dr. George W. Housner has joined the California Institute of Technology, Pasadena, Calif., staff as an associate professor of mechanical engineering. He has returned from military service where he was in charge of design and construction of certain military installations and was an advisor on weights, terrain and other factors influencing bombing missions.

* * *

Col. James G. Truitt, Seattle, Wash., and Alaska Army Engineer officer, has returned to Seattle wearing the Legion of Merit and the Chinese medal, the Order of Cloud and Banner, for his work in locating the pioneer line of the Ledo-Burma road. Before going to the Orient he directed surveying of the Rocky Mountain Trench as a possible location for a rail line to connect Alaska with the U. S. and Canadian shipping points.



COL. JAMES G. TRUITT

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F. W. Panhorst, structural engineer, has been elected a director of the American Society of Civil Engineers, District 13, embracing the San Francisco, Sacramento and Utah sections. He is chief bridge engineer for the Calif. Division of Highways, Sacramento, Calif.

* * *

Col. E. G. Thomas, Salt Lake City, Utah, district Army engineer, has retired. He was in charge of construction totaling $165,000,000 in the northern Utah area. Among his many projects were Camp Kearns, Salt Lake Air Base, Hill Field, Wendover Air Base, Bushnell General Hospital, Ogden Ordnance Plant, Ft. Douglas Reception Center and Tooele Ordnance Plant.

* * *

Jesse E. Stanton, division engineer for the Federal Public Buildings Administration in San Francisco, Calif., has been promoted to deputy commissioner for design and construction for the FPBA in Washington, D. C. While he was division engineer he designed various public buildings in San Francisco. He was director of color and lighting at the Golden Gate Exposition.

* * *

Col. Ralph A. Tudor, Portland, Ore., district engineer who supervised completion of the Bonneville power dam and other large construction projects, will accept a post with Morrison-Knudsen Co. of Boise, Ida., on his release from the Army several weeks from now. Before entering the service he was engineer in charge of the San Francisco-Oakland Bay Bridge.

* * *

Clarence H. Kromer is now employed as a civilian with the Army Engineers doing important investigation of the water resources of California. Formerly, he was principal structural engineer for the Division of Architecture and later worked with the Federal Housing Agency, Oakland, Calif.

* * *

Lt. Col. Harold J. Martin, Post Engineer at Smoky Hill Airport, Salina, Kan., has been named city manager of Ontario, Calif. He was released from the Army Dec. 1 and took over his new position immediately. Before the war he served in the City Engineer's office at Los Angeles, Calif. During his army career he was Post Engineer at Jefferson Barracks, St. Louis, Mo.

* * *

Dr. Charles Gilman Hyde, professor of sanitary engineering at the University of California, has been retained by the cities of Pasadena, South Pasadena and Alhambra, Calif., as consultant, to advise local officials on the future course of sewage treatment for the area.

* * *

Capt. Douglas M. Pelton, Corps of Engineers officer, has been transferred to the Fort Lewis Army Separation Center in Washington. In 1942 he was stationed at the Anchorage, Alaska, Army Engineer headquarters as a construction project engineer supervising projects in Nome, Attu, Shemya and Kiska as well as other parts of Alaska. In 1943 he was transferred to the Seattle District Engineer office and made officer in charge of Alaska services. In civilian life he was a Milwaukee, Wis., and Portland, Ore., contractor.

CAPT. DOUGLAS M. PELTON

WALTER R. MACATEE

Capt. William J. NePage, Corps of Engineers officer, has been transferred to the Fort Lewis Army Separation Center in Washington. During his army service he was assistant personnel officer, security officer and recently assistant to the chief of the Supply Division of the U. S. Army Engineers, Seattle, Wash., district. He was associated with an electrical contracting firm in Seattle, Wash., before he went into active duty.

* * *

John W. Hall, engineer, Whitehall, Mont., has been retained by the Big Flat Electric Cooperative, Inc., to plan construction of REA-financed power lines to serve Turner, Hogeland, Loring, Whitewater and adjacent areas in Montana, and possibly Canada.

* * *

Charles R. Baird formally entered his duties as city manager of Glendale, Calif., on Oct. 25. **Edwin A. Ingham,** his predecessor, became ciy manager of Alhambra, Calif., in November.

* * *

R. C. Briggs is now technical adviser to the Division of Irrigation, Venezuela. He is on a one-year assignment from the U. S. Geological Survey to study the water supply of Caracas, Venezuela.

* * *

Edwin A. Verner is now doing structural engineering work with Frank Wynkoop and Associates in San Francisco, Calif.

* * *

Harlen H. Smith, civil and structural engineer, has enlarged his practice in Seattle, Wash., to include surveying. He has also taken **William H. Hill,** Seattle surveyor, into his firm.

* * *

Jack Y. Long, formerly with Kaiser Engineers, has opened an office in Oakland, Calif., as a consulting engineer.

* * *

George Douglas resigned his position as city engineer of Grandview, Wash., in October. He plans to enter the field of industrial construction.

Walter R. Macatee has been named manager of the American Road Builders Association Airport Division, Washington, D. C. He has had much experience in airport construction, serving as Washington representative for the Asphalt Institute. He has also spent a number of years with the Edison Portland Cement Co. and the Asphalt Division of the Texas Co. Macatee is a member of the Association of Asphalt Paving Technologists and the Society of Military Engineers.

* * *

Lt. Col. Arthur P. Banta, civil engineer of Pasadena, Calif., recently returned from active military duty as a sanitary engineer. He has rejoined the faculty at the California Institute of Technology in Pasadena, Calif. He will serve as an associate professor of sanitary engineering.

* * *

J. Herbert Warner, who was formerly resident engineer on the construction of Seminoe dam and power plant, Wyo., and later Friant dam, Calif., has retired after 22 years' service in the Dam Department of the Bureau of Reclamation.

* * *

Col. Chester K. Harding has been appointed deputy service command engineer at Fort Douglas, Utah. He is a veteran regular army officer and succeeds **Col. L. V. Sheridan,** who has been released from active duty.

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Earl C. Thomas is now associated in the firm of Thomas and Whipple, consulting engineers. They are located in Palo Alto, Calif.

* * *

Vern A. Glascock has been appointed resident engineer in the Boise, Ida., office of the Army Engineers. **Kenneth Dibblee** will take up his duties as resident engineer in the Portland, Ore., office of the Corps soon.

NEAL D. SMITH took up his new duties as City Engineer of San Diego, Calif., on Dec. 1. For the past six years he has been City Manager of Ontario, Calif. He tendered his resignation Oct. 24. At San Diego he succeeds HANS W. JORGENSON.

* * *

Harold P. King, structural engineer, has resumed his practice in Los Angeles, Calif. He has been with the Seabees in the Pacific for three years.

* * *

C. F. Griggs, former Spokane County, Wash., engineer, has returned from active duty as a captain in the Army.

SUPERVISING THE JOBS

Hugh Tolley is the construction engineer and **E. L. Stephens** is the project superintendent for the Klamath Straits project in Oregon for Tru-Mix Concrete Co., Medford, Ore. **Glenn Waggoner** is the chief inspector and **Louis Petzoldt** and **William Golden** are assisting him. The project includes drains, pumping stations and plants, a flume, siphons and a bridge. Men doing the work are **R. H. Puddycomb,** superintendent; **J. H. Henson,** general foreman; **D. W. Canham,** carpenter foreman; **L. L. Ultican,** concrete foreman, and **W. Herrmann,** labor and earthworks foreman. **C. F. Davenport** and **H. C. Pinkard** are lead men and **L. F. Kirkland** is the master mechanic.

* * *

E. Bartell is job superintendent for a $500,000 building addition in Beverly Hills, Calif. C. L. Peck, Los Angeles, Calif., contractor, has the contract to build the 8-story addition and alter the face of Saks Fifth Ave. store.

C. V. (Clyde) Rettig is job superintendent for the Austin Co., Seattle, Wash., on a truck sales and service building at Klamath Falls, Ore. **James A. (Jim) Blue** is the assistant superintendent and **J. J. (Johnnie) Parks** is the chief clerk.

* * *

Andrew Officer is general superintendent for Lembke Construction Co., Albuquerque, N. M., on their various building projects at Las Vegas, Nev. Officer was superintendent in charge of hangar construction at the Naval Air Station, Alameda, Calif., in 1940.

* * *

R. J. (Bob) Jenks is project manager for Guy F. Atkinson Co., San Francisco, Calif., on their contract at Boulder dam. **R. W. Atkinson** is assistant project manager and **R. G. (Bob) Brown** is the engineer. Excavation superintendent is **James Sinfield,** electric superintendent is **Evert Gowan,** concrete superintendent is **Dinty**

LOU E. STEELMAN

Greenwood, and rigger superintendent is **Walt Wicklund. W. B. (Bill) Rives** is carpenter foreman, **Earl Platt** is truck foreman and **C. E. (Fergie) Ferguson** is master mechanic.

* * *

Bill McDonald is the job superintendent for Charles Shannon, Butte, Mont., contractor, on a $190,959 electric distribution project covering 133.7 mi. in the Big Hole Basin, Beaverhead County, Mont.

* * *

Frank Inglehorn is the resident engineer and **Charles P. Hall** is the general superintendent for Nyberg Construction Co., Spokane, Wash., on a rock crushing job in Asotin County, Wash. **G. S. Turnbloom** is the foreman.

* * *

E. D. Mincey is job superintendent for the Austin Co., Oakland, Calif., contractors. They are constructing an $800,000 can factory and warehouse in Sacramento, Calif. **Pauline Abrew** is chief clerk.

* * *

Elmer Groff is foreman for Elmer W. Duhame, Phoenix, Ariz., contractor, on several jobs in the Phoenix area. They are working on a number of store buildings there.

* * *

Jimmy Sheeks is supervising construction of a $115,000 garage being erected for Fortner Bros. on Crenshaw Blvd., in Los Angeles, Calif., by Z. B. Barker Co., Los Angeles building contractors.

* * *

Ray Spurzam is the resident engineer for Nyberg Construction Co., Spokane, Wash., on a grading, surfacing and oiling road job in Flathead County, Mont. The work will probably be completed in July, 1946.

* * *

A. G. Buchanan is the general superintendent for C. L. Peck, Los Angeles contractor, on a $275,000 contract to build a mausoleum in Glendale, Calif. **Robert Youmans** is the job superintendent.

Thomas F. O'Mara and **L. E. Steelman** are job superintendents for Morrison-Knudsen Co., Boise, Ida., on their $3,000,000 contract to build a transmission line and power plant. O'Mara superintends construction of 120 mi. of transmission line from Hagerman Valley to Emmett and Boise, Ida. Steelman is in charge of building a 16,500-kw. hydroelectric generating plant in Snake River Canyon, Ida. Formerly he was superintendent in charge of the Sauvie Island Project near Portland, Ore.

* * *

S. A. Johnson is the job superintendent for a $1,500,000 building contract which Baruch Corporation, Los Angeles, Calif., holds. **C. R. Page** is the assistant superintendent and **J. P. Norman** is the labor foreman for construction of the six-story service building in Los Angeles, Calif.

* * *

Nels Rasmussen and **Ed Nicholas** are superintendents for a $68,430 highway improvement contract awarded to R. L. Moss, Zenith, Wash., contractor. They are building 13 bridges and culverts on the state highway betwen Blaine, Wash., and Skagit County line, Wash. **George K. Campbell** is the office manager.

* * *

R. H. (Dutch) Hapgood is the job superintendent for N. M. Ball Sons, Berkeley, Calif., contractors, for a $637,799 highway improvement contract near San Clemente, Calif. **Roy Jones** is the grading foreman, **Elmer Sholin** is the master mechanic and **K. J. King** is the office manager.

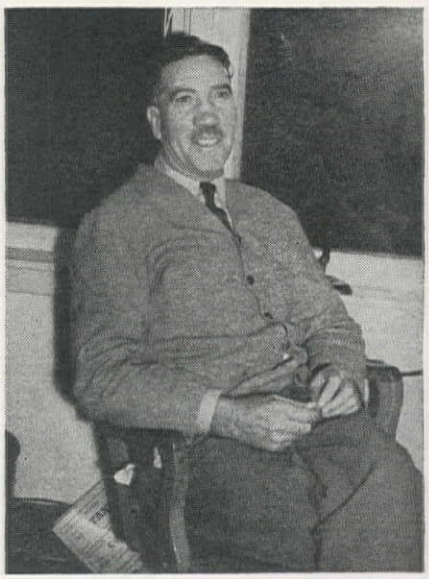
* * *

Roy Cram, sole owner of the Vegas Rock and Sand Co., Las Vegas, Nev., is personally supervising work at Battle Mountain, Nevada, for the Civil Aeronautics Authority. **Wesley J. Dill** is seuperintendent, **Vern P. Sharp** is engineer, **John C. Lawson** is crusher foreman and **G. H. Morgan** is plant superintendent.

* * *

Ted Beebe is the superintendent for a $150,000 factory building job which the Austin Co., Oakland, Calif., contractors, are handling. The building is in Emeryville, Calif. **L. A. MacLean** is the chief clerk.

R. J. CONLEY, superintendent of construction for Arundel Corp. & L. E. Dixon Co., contractors on construction of Horseshoe dam on the Verde river, 60 mi. north of Phoenix, Ariz.



THOMAS F. O'MARA

Fletcher T. Horn is job superintendent for R. J. Daum, building contractor of Inglewood, Calif., on a $97,000 contract to construct an office building in San Pedro, Calif. He recently supervised a $140,000 contract on a telephone building in San Diego, Calif.

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Willard Davidson is job superintendent for Paul Paulsen, Salt Lake City, Utah, on that company's $150,000 contract to construct a brick and concrete garage and office building and a bus yard at Salt Lake City.

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J. H. Beale is the superintendent for W. C. Thompson, contractor of San Francisco, Calif., on a $245,290 contract to do further work on the irrigation system near Bend, Ore.

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Robert D. Paterson is the project manager and has the $150,000 contract to construct a two-story, 34-unit motel in Santa Barbara, Calif. **Leslie Barber** is the job superintendent.

* * *

C. Stafford is the job superintendent for C. L. Peck, Los Angeles, Calif., contractor, on a department store building in Los Angeles, Calif., estimated to cost $1,500,000.

* * *

Benjamin Huenergard is superintendent for the Huenergard Electric Co., Portland, Ore., on their $64,508 job to build 71.7 mi. of electric line in Deschutes County, Ore.

* * *

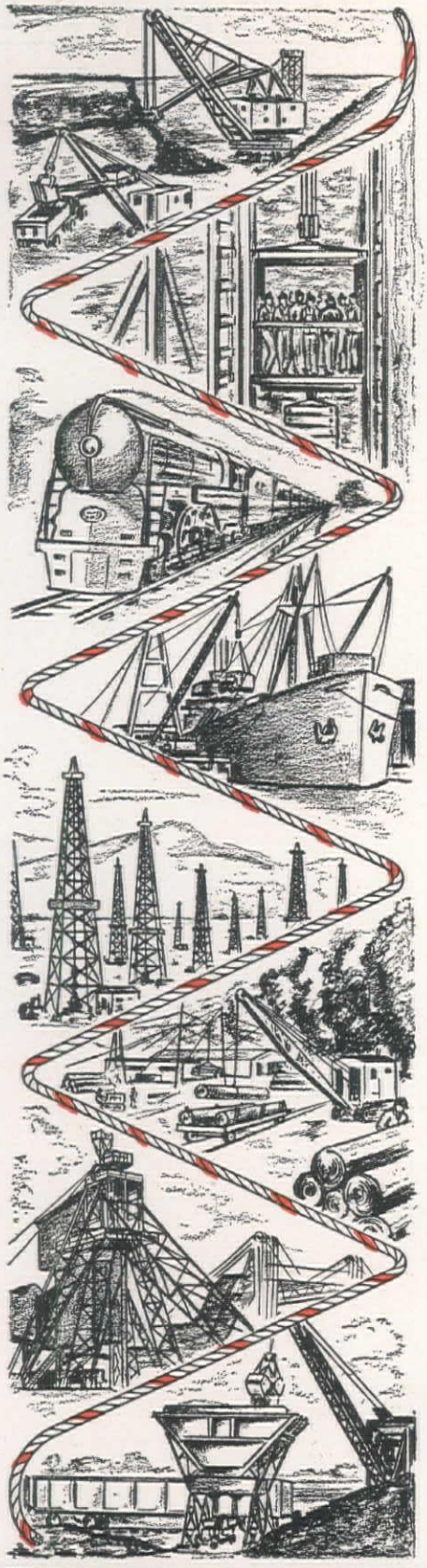
Dean S. Peterson, construction worker for a Los Angeles, Calif., firm, has just been released from the Army after four years of service.

* * *

Asa Eckel is now a general contractor on the Lewis Crowley Bldg. in Prescott, Ariz. For many years he had been supervising construction in the Prescott area.

* * *

Lloyd Lowe is superintendent for M. B. Hicks on housing projects at Las Vegas, Nev.



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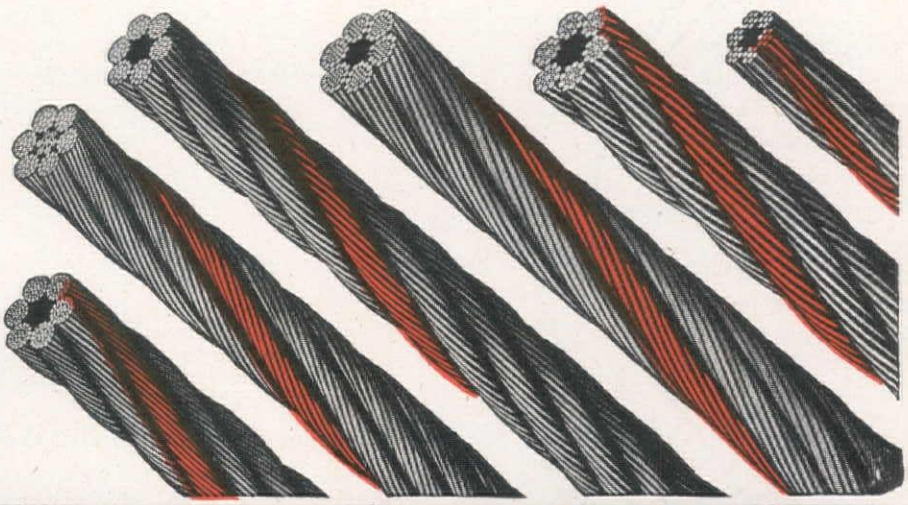

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UNIT BID SUMMARY

Highway and Street...

Arizona—Pima County—State—Grade and Surface

P.D.O.C., General Contractors, Tucson, submitted the low bid of $198,373 to the Arizona Highway Deparment, Phoenix, for the construction of 7.75 mi. of the Tucson-Ajo highway extending northeast from the town of Sells. Unit bids, quantities and totals of the bidders follows for the grading, draining and bituminous surfacing of the project:

(A) P.D.O.C., Gen'l Contractors.....$198,373
(B) W. J. Henson..... 208,987
(C) R. H. Martin..... 226,752
(D) The Tanner Const. Co..... 236,502
(E) Phoenix-Tempe Stone Co..... 244,604
(F) Packard Contr. Co..... 246,977
(G) Lee Moor Contr. Co.....$248,492
(H) L. M. White..... 256,648
(I) Wallace & Wallace..... 256,997
(J) Fisher Contr. Co..... 258,358
(K) L. E. Skousen..... 272,506

(1) 20,457 cu. yd. roadway excav. (unclass.)
(2) 7,156 cu. yd. drainage excav. (unclass.)
(3) 3,149 cu. yd. structural excav. (unclass.)
(4) 53,132 sta. yd. station yard overhaul
(5) 114,145 ton imported borrow (CIP)
(6) 23,550 ton select material (CIP)
(7) 21,550 ton aggregate base (CIP)
(8) 14,800 cu. yd. stripping pits
(9) 3,478 M. gal. sprinkling (CIP)
(10) 1,504 hour rolling
(11) 1,587 cu. yd. Cl. "A" conc. (incl. cement)
(12) 216 cu. yd. Cl. "D" conc. (incl. cement)
(13) 202,384 lb. reinforcing steel (bars) (CIP)
(14) 252 lin. ft. structural steel handrail (CIP)
(15) 428 lin. ft. 24-in. CM.P. (CIP except excav.)
(16) 120 lin. ft. 36-in. C.M.P. (CIP except excav.)
(17) 1 each cattle guard (2 unit)
(18) 3 each resetting cattle guards
(19) 150 lin. ft. rail bank protection (Type "A") (CIP)
(20) 74,390 lin. ft. standard line fence (CIP)
(21) 19 each standard wire gates (Type 2) (CIP)
(22) 7 each standard steel gates (Type 1) (CIP)
(23) 117 each guide posts (CIP)
(24) 50 each right-of-way markers (Type "E") (CIP)
(25) 850 lin. ft. lowering 4-in. water line (CIP)
(26) 68,785 gal. road oil (SC-2) (for B.S.T.) (CIP)
(27) 34,395 gal. road oil (SC-6) (for B.S.T.) (CIP)
(28) 1,034 ton blotter material (CIP)

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
(1)	.85	1.07	.65	.90	1.25	1.10	.60	1.00	1.10	.92	1.45
(2)	.35	.40	.35	.50	.30	.22	.75	.50	.50	.51	.60
(3)	1.50	2.00	1.00	2.00	1.25	2.25	2.00	2.00	2.00	1.63	2.50
(4)	.02	.04	.03	.01	.01	.02	.02	.03	.02	.025	.03
(5)	.35	.26	.50	.42	.45	.50	.45	.55	.50	.50	.45
(6)	.50	.33	.60	.45	.45	.53	.60	.55	.60	.60	.70
(7)	.75	.88	.85	.95	.75	1.06	.90	.95	1.00	1.02	1.20
(8)	.15	.27	.20	.20	.12	.16	.20	.15	.25	.26	.25
(9)	1.50	2.70	2.50	3.00	3.50	3.25	4.00	2.25	2.50	4.47	3.00
(10)	5.00	6.75	5.00	5.00	4.50	4.25	4.00	5.00	5.50	6.75	6.00
(11)	27.50	27.00	30.00	29.00	32.00	28.50	35.00	32.50	32.00	31.50	35.00
(12)	29.00	29.50	32.00	31.00	32.00	32.00	35.00	35.00	34.00	31.50	35.00
(13)	.06	.075	.07	.08	.09	.08	.11	.07	.08	.07	.075
(14)	6.50	8.00	5.50	12.00	7.50	8.00	7.00	7.00	7.00	8.86	10.00
(15)	3.50	4.50	3.50	3.75	5.00	4.00	3.50	4.00	3.50	3.52	5.50
(16)	5.00	7.50	6.00	6.60	8.00	7.25	6.50	7.00	6.40	7.13	8.50
(17)	400.00	550.00	400.00	500.00	450.00	330.00	350.00	500.00	400.00	454.00	400.00
(18)	100.00	275.00	100.00	300.00	350.00	65.00	200.00	100.00	200.00	241.00	300.00
(19)	6.50	6.00	8.00	6.50	5.00	5.40	5.00	6.00	9.00	7.50	5.00
(20)	.10	.11	.12	.18	.12	.14	.15	.09	.15	.09	.12
(21)	10.00	10.00	10.00	15.00	15.00	5.00	20.00	10.00	10.00	19.35	20.00
(22)	30.00	40.00	35.00	35.00	50.00	29.00	40.00	40.00	50.00	38.60	50.00
(23)	4.00	5.50	3.00	6.50	5.50	5.50	3.50	5.00	4.00	6.77	4.00
(24)	5.00	5.50	4.00	6.00	7.50	5.00	5.00	5.00	5.00	5.50	6.00
(25)	1.50	1.35	1.00	1.50	2.50	1.75	2.00	1.00	1.00	1.94	.50
(26)	.10	.10	.10	.10	.13	.105	.14	.10	.12	.12	.12
(27)	.12	.115	.12	.11	.15	.134	.14	.12	.14	.15	.14
(28)	1.50	2.70	1.50	4.00	3.50	3.00	4.00	3.50	3.00	5.20	2.00

California—San Bernardino County—State—Surfacing

Schroeder & Co., Roscoe, Calif., made the lowest bid of $173,775 to the Division of Highways, Sacramento, for the repair of 22 miles of highway between Barstow and Field by placing plant-mixed surfacing over the existing surface and reshaping the shoulders.

(A) Schroeder & Co.....$173,775
(B) Tanner Construction Co..... 179,330
(C) Basich Bros. Const. Co..... 197,380
(D) Lewis Construction Co..... 197,412
(E) Oswald Bros. 200,006
(F) Matich Bros. $205,260
(G) Griffith Company 220,475
(H) I. E. Haddock, Ltd. 221,495
(I) Dimmitt & Taylor 259,510

(1) 110 tons asphalt paint binder
(2) 47,800 tons mineral aggregate (P.M.S.)
(3) 2,250 tons paving asphalt (P.M.S.)
(4) 22 mi. reshaping shoulders

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	41.00	25.00	50.00	50.00	40.00	50.00	45.00	45.00	36.00
(2)	2.80	2.85	3.10	3.24	3.27	3.45	3.50	3.65	4.50
(3)	15.50	15.00	16.00	16.00	16.00	15.00	18.50	16.50	17.00
(4)	25.00	300.00	350.00	50.00	150.00	50.00	300.00	225.00	100.00

Montana—Blaine and Hill Counties—State—Grade and Surface

O'Neil Construction Co., and Nilson Smith Construction Co., Great Falls, submitted the low bid of $282,993 and was awarded the contract by the State Highway Commission, Helena, for the construction of 10.8 mi. of the Havre East section of U.S. Route 2 between Chinook and Havre. Unit bids received for the project are as follows:

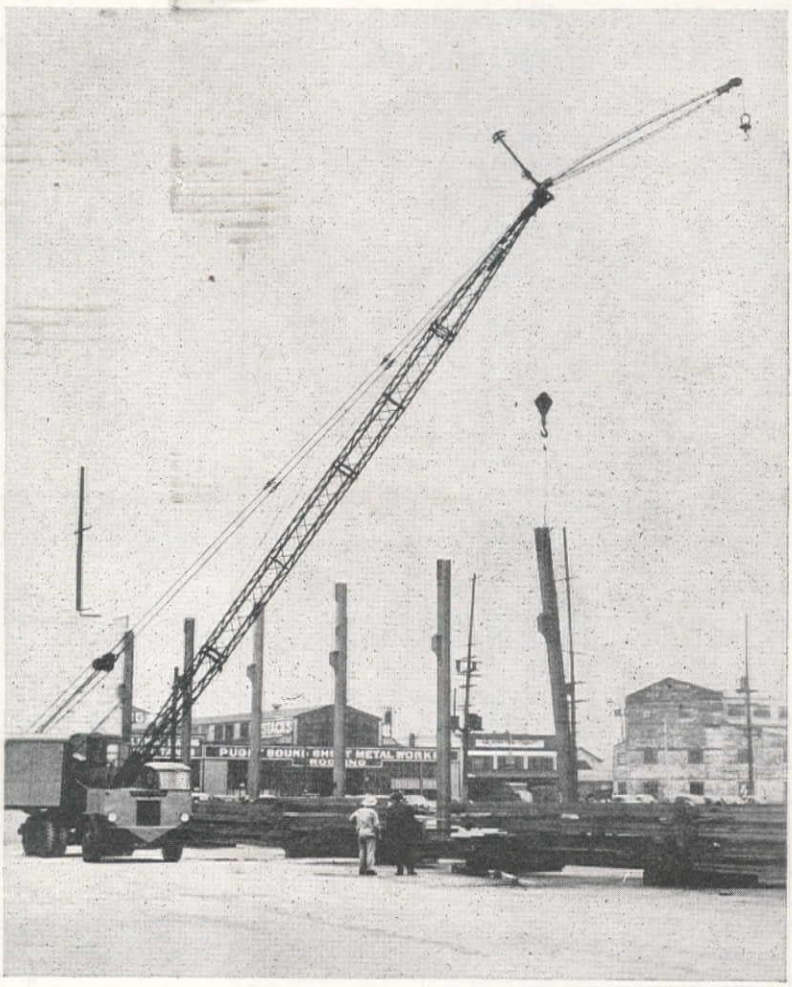
(1) O'Neil Const. Co. and Nilson Smith Const. Co. $282,993
(2) S. Birch & Sons Const. Co..... 287,380
(3) Inland Construction Co., Inc..... 300,286
(4) Big Horn Const. Co.....$305,519
(5) McLaughlin, Inc. 314,145
(6) Union Construction Co..... 332,866
(7) A. T. Nolan 370,477

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
332,095 cu. yd. unclass. excav. and borrow	.185	.17	.192	.20	.23	.30	.30
1,963 cu. yd. culvert excav.	1.25	1.00	.62	1.00	1.25	1.00	1.25
963,350 sta. yd. overhaul	.0075	.01	.0075	.01	.01	.01	.01
102,620 cu. yd. selected material	.63	.55	.62	.55	.58	.60	.60
70,444 ton base course cr. grav. surf.	.68	.71	.82	.80	.83	.75	.90
19,836 ton gr. A top crse. cr. grav. surf.	.77	.81	.98	1.50	.96	1.00	1.10
2,427 ton stone chips	5.00	5.90	5.30	4.75	5.00	3.50	5.00

(Continued on next page)

watch LORAINS GO!

SEATTLE WAREHOUSE TAKES SHAPE as McRAE BROS.' NEW LORAIN MOTO-CRANE ERECTS STEEL



As soon as the war ended, Contractors and Lorains started to team up together. The new Lorain, shown here, working on a job in this territory, is but one example of what's going on all over the country as profit-conscious Contractors are again turning to Lorains to do their jobs better, faster, at greater savings and profits.

Thew-Lorain offers them a complete line of products—crawler or rubber-tired mountings convertible as Shovels, Cranes, Clamshells, Draglines, Hoes—incorporating new improvements and features . . . longer life . . . additional economies and job-profit possibilities. See your dealer for facts!

McRae Brothers of Seattle, Washington, depend on the versatility, speed and economy of their Lorain "414" Moto-Crane . . . use it on such jobs as construction of this new steel warehouse for A. M. Castle & Co. Their Moto-Crane is equipped with a 65-foot boom, plus 15-foot extension.

THE THEW SHOVEL CO.
Lorain, Ohio

CRANES • SHOVELS • DRAGLINES • CLAMSHELLS • MOTO-CRANES

See Your thew-Lorain Dealer

Le Roi-Rix Machinery Co., Los Angeles 11
Cate Equipment Co., Salt Lake City 4
Liberty Trucks & Parts Co., Denver 1
Coast Equipment Company, San Francisco 1
A. H. Cox & Co., Seattle 4, Washington
Bunting Tractor Co., Inc., Boise, Twin Falls, Gooding, Fairfield, and Burley, Idaho; LaGrande, Oregon
Connelly Machinery Company, Billings and Great Falls, Montana
Sanford Tractor & Equipment Co., Reno, Nevada
The Mountain Tractor Co., Missoula, Montana
The Tractor & Equipment Co., Sidney, Montana
P. L. Crooks & Co., Portland 10, Oregon

2,700	cu. yd. binder	.01	.01	.06	.01	.10	.20	.20
5,400	yd. mi. overhaul on binder	.01	.01	.06	.01	.10	.20	.10
9,960	M. Gal. watering	1.75	2.00	.80	1.50	1.50	1.80	3.00
760	unit rolling	4.50	6.00	6.80	6.25	6.00	6.00	7.00
66,667	gals. pr. coat oil (SC-2 A rd. oil)	.13	.12	1.07	.08	.11	.12	.19
66,667	gals. seal coat oil (150-200 pen. asph.)	.13	.13	.107	.09	.12	.12	.19
492	lin. ft. 18-in. reinf. conc. pipe culv.	2.25	3.00	3.40	3.00	2.50	3.00	2.50
2,150	lin. ft. 24-in. reinf. conc. pipe culv.	3.50	4.40	4.60	4.50	4.00	4.10	3.50
72	lin. ft. 30-in. reinf. conc. pipe culv.	5.00	6.50	6.80	6.50	6.00	3.50	4.00
580	lin. ft. 36-in. reinf. conc. pipe culv.	7.00	9.00	9.10	9.00	8.00	7.60	7.00
192	lin. ft. 48-in. reinf. conc. pipe culv.	11.95	14.50	14.60	15.00	14.00	13.00	12.00
136	lin. ft. 24-in. ex. str. reinf. conc. pipe culv.	4.00	5.00	5.40	5.00	5.00	4.85	4.00
312	lin. ft. 48-in. ex. str. reinf. conc. pipe culv.	14.00	16.50	17.50	16.75	17.00	17.00	14.00
80	lin. ft. 18-in. corr. metal syphon pipe	2.60	2.90	3.40	3.50	2.75	3.50	3.50
220	lin. ft. 24-in. corr. metal syphon pipe	3.75	4.50	5.20	5.00	4.50	4.50	5.00
144	lin. ft. 30-in. corr. metal syphon pipe	4.50	5.50	6.20	6.00	5.50	6.00	6.00
764	lin. ft. 36-in. corr. metal syphon pipe	7.00	7.50	8.40	9.00	7.50	7.00	8.50
96	lin. ft. lam. wd. gd. rail (T.T. posts)	2.00	2.00	6.00	2.25	4.00	2.00	5.00
860	sq. yd. grouted riprap	3.50	4.75	7.80	3.50	6.00	4.00	5.00
3,700	lin. ft. wood slat snow fence	.30	.40	.32	.40	.35	.40	.40
2	each conc. project markers	10.00	10.00	9.40	20.00	20.00	25.00	15.00
58	each conc. station markers	5.00	5.50	5.90	7.00	5.00	5.00	5.00
115	each conc. r/w monuments	3.00	4.00	4.20	3.50	4.00	5.00	3.00
380	lbs. structural steel	.13	.20	.32	.15	.25	.20	.25
350	lbs. reinforcing steel	.13	.15	.32	.10	.20	.10	.15
6	cu. yd. Class A concrete	35.00	40.00	72.60	50.00	50.00	50.00	50.00
1,630	ton stock piled gravel	.67	.83	.90	1.00	.90	.90	1.10

Montana—Fergus County—State—Grade and Surface

S. Birch & Sons Construction Co., Great Falls, offered the low bid of $168,956 and was awarded the contract by the State Highway Commission, Helena, to construct 7.7 mi. of section B of the Armington-Lewistown road. Unit bids received are as follows:

(1) S. Birch & Sons Construction Co. $168,956
(2) Union Construction Co. 173,988
(3) Big Horn Construction Co. 180,070
(4) McLaughlin, Inc. 182,096
(5) Nilson Smith Const. Co., and O'Neil Const. Co. $202,984
(6) Inland Construction Co. 203,469
(7) Northwestern Engr. Co. 210,051
(8) S. J. Graves & Sons Co. 249,127

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
213,048	cu. yd. unclass. excav. and bor.	.175	.22	.28	.24	.24	.25	.29	.30
912	cu. yd. culvert excav.	1.50	1.00	1.00	1.25	1.00	.62	1.30	1.50
1,052,400	sta. yd. overhaul	.01	.01	.01	.005	.01	.008	.015	.01
53,720	cu. yd. sel. bor. base crse.	.50	.45	.55	.46	.80	.68	.50	.70
50,361	ton base crse. surfacing	.65	.70	.75	.75	.70	.84	.87	1.25
14,281	ton Gr. A top crse. surf	.80	.85	1.15	.84	.80	.98	1.00	1.50
1,729	ton stone chips	6.20	4.00	5.00	4.50	5.00	6.20	4.00	5.00
2,210	cu. yd. binder	.01	.05	.01	.10	.05	.05	.25	.30
4,420	mi. yd. overhaul on binder	.01	.05	.01	.10	.05	.05	.10	.15
6,180	M. gal. watering	2.00	1.50	1.50	2.00	2.00	.88	1.80	2.00
592	unit rolling	6.00	6.00	6.25	6.00	5.00	7.75	4.25	6.00
47,719	gal. pr. ct. oil (SC-1 A rd. oil)	.11	.10	.08	.12	.14	.107	.12	.10
47,719	gal. seal. ct. oil (150-200 A cem.)	.11	.12	.08	.13	.15	.107	.12	.11
668	lin. ft. 15-in. corr. metal pipe cul.	1.80	2.00	2.00	2.00	2.00	2.60	2.00	2.00
206	lin. ft. 18-in. corr. metal pipe cul.	2.00	2.50	3.00	2.50	2.50	3.40	2.40	3.00
650	lin. ft. 24-in. corr. metal pipe cul.	3.00	3.25	4.00	3.50	4.00	4.30	3.50	5.00
28	lin. ft. 30-in. corr. metal pipe cul.	4.00	4.00	5.00	4.50	5.00	5.80	5.00	8.00
146	lin. ft. 36-in. corr. metal pipe cul.	6.00	6.00	7.00	6.50	7.00	7.60	7.00	10.00
152	lin. ft. 48-in. corr. metal pipe cul.	8.40	11.00	9.00	10.00	9.00	12.60	14.00	13.00
12	lin. ft. 15-in. cor. met. syph. pipe	3.50	3.00	4.00	4.00	4.00	4.20	3.50	4.00
164	lin. ft. 18-in. cor. met. syph. pipe	3.00	4.00	4.50	4.00	4.00	4.80	3.90	4.50
76	lin. ft. 24-in. cor. met. syph. pipe	4.50	5.00	5.00	5.00	5.00	5.60	4.50	7.00
306	lin. ft. relaying pipe culverts	1.50	1.00	1.50	1.50	1.00	1.50	1.50	2.00
80	cu. yd. grav. back. culv. founda.	1.50	2.00	2.00	3.00	5.00	3.80	3.50	3.00
650	sq. yd. grouted riprap	4.50	6.00	3.50	6.00	4.00	9.40	3.60	4.00
2	ea. conc. proj. markers	10.00	25.00	15.00	20.00	10.00	10.00	17.00	20.00
40	ea. conc. station markers	5.50	5.00	10.00	6.00	5.00	7.00	6.00	5.00
79	ea. conc. r/w monuments	4.00	3.00	5.00	4.00	3.00	5.00	4.00	4.00
1,000	ton stock piled gravel	.80	1.00	1.00	.80	.80	.92	1.25	1.25

Washington—Lewis County—State—Grade and Surf.

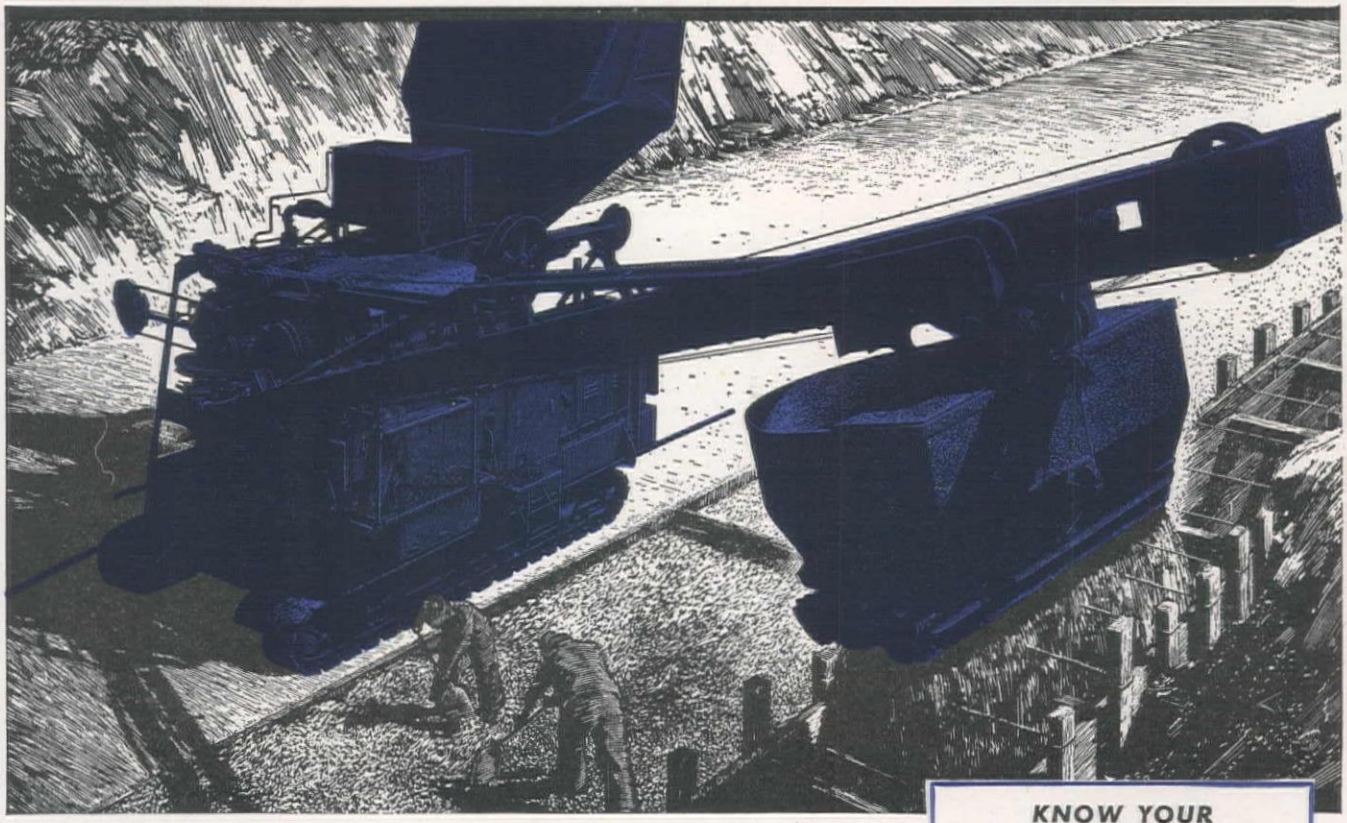
Homer G. Johnson, Portland, Oregon, was awarded the contract on the low bid of $93,645 to the Department of Highways, Olympia, for the construction of the Cinebar to Bear Canyon section of SR No. 5-K, about 4.4 mi. in length. A reinforced concrete bridge is included in the contract. Summary of the unit bids follows:

(1) Homer G. Johnson ..... $ 93,645
(2) J. D. Shotwell 114,824
(3) Max J. Kuney Company 119,836
(4) Peter Kiewit Sons Co. 124,617
(5) Graham Bros. $127,798
(6) L. Coluccio Co. 145,438
(7) T. W. Thomas (irregular bid) 100,710

		(1)	((2)	(3)	(4)	(5)	(6)	(7)
12.2	ac. clearing	100.00	225.00	300.00	380.00	225.00	400.00	200.00
6.5	ac. grubbing	100.00	300.00	175.00	185.00	250.00	400.00	200.00
4,060	cu. yd. unclass. excav., including haul	.60	1.50	1.00	.90	1.25	.85	1.00
30	cu. yd. com. trench excav., including haul	2.00	4.50	1.50	3.00	5.00	2.00	2.00
270	cu. yd. structure excav.	2.50	3.00	3.00	3.00	3.00	2.00	3.00
233.2	stas. (100-ft.) roadway preparation	7.00	6.00	20.00	11.00	8.00	15.00	10.00
233.2	stas. (100-ft.) finishing roadway	7.00	6.00	5.00	11.00	10.00	20.00	8.00
29,020	cu. yd. sel. rdwy. borrow in pl., incl. haul	1.40	1.45	1.55	1.70	1.60	2.00	1.25
25	cu. yd. gravel backfill in place	2.50	3.00	3.00	5.00	5.00	3.50	4.00
2,060	cu. yd. cr. st. surf. top crse. in pl. on rdwy.	2.40	2.77	2.85	3.00	3.50	3.75	2.45
5,590	cu. yd. cr. st. surf. base crse. in pl. on rdwy.	2.40	2.62	2.60	2.50	3.50	3.75	2.45
980	cu. yd. cr. stone filler in pl. incl. haul	2.50	2.77	2.60	3.00	3.50	3.75	2.45
831	M. gal. water	1.50	2.25	2.50	2.00	3.00	3.50	2.00
3,520	cu. yd. cr. cover stone in stkpls.	2.00	3.15	2.85	2.80	3.50	2.90	2.60
	MIN. AGGR. FOR NON-SKID SINGLE SEAL TREAT. SCH. A IN STKPLS.							
2,360	cu. yd. crse. cr. scr. ⅝-in. to ¼-in. in stkpls.	1.80	3.45	3.00	2.80	3.50	2.90	2.75
720	cu. yd. fine cr. scr. ¼-in. to 0 in stkpls.	2.00	2.15	2.60	2.80	3.50	2.90	2.75
40	lin. ft. relay. ex. iron water pipe ½-in. diam.	.50	.75	.50	2.00	1.00	.65	1.00
40	lin. ft. relay. ex. iron water pipe 2-in. diam.	.50	.75	.50	3.00	1.00	.85	1.00
351	lin. ft. relay. conc. culv. pipe 12-in. diam.	1.50	1.50	1.25	1.00	1.25	.75	1.00
72	lin. ft. plain conc. or V.C. dr. pipe 8-in. diam. in place	1.00	1.20	1.50	1.40	1.00	.90	1.50
54	lin. ft. plain conc. or V.C. culv. pipe 12-in. diam. in place	1.50	1.65	2.00	2.00	1.50	1.60	1.50
108	lin. ft. st. reinf. conc. culv. pipe 18-in. diam. in place	3.00	3.75	3.50	4.25	2.75	3.10	2.50
27	lin. ft. st. reinf. conc. culv. pipe 24-in. diam. in place	4.50	6.75	5.50	6.00	4.00	4.60	5.00

(Continued on next page)

THIS "LIVE BOOM" PAVER LOWERS COSTS



Let's consider the unique advantages of the boom on a standard 34-E Ransome Blue Brute "Dual Drum" Paver to see why you can lay more yardage . . . more accurately . . . with less manpower . . . than with any other paver.

Because this boom is really a "live boom" just like your crawler crane, it can be power-elevated to allow 9 ft. clearance under the bucket. And the paver can be operated *continuously* with the boom in the elevated position.

Think what that means. Whenever you want, or as often as you want, you can concrete retaining walls, abutments, headwalls, etc. in one operation *at the same time you lay the slab.* You eliminate the extra expense of doing those operations separately.

Moreover, because this "live boom" *spreads as it swings* it covers wider area with each batch . . . cuts down on costly hand shoveling.

OTHER BLUE BRUTE PLUSSES

In addition, a Blue Brute "Dual Drum" Paver has the fastest-charging, self-cleaning skip . . . hydraulically-controlled bucket, eliminating split batches . . . metal-to-metal spiral cut-off for precise water measuring . . . mechanically-operated batchmeter for all-season accuracy. These and other features are described in detail in Bulletin 208. Write for it.

24RS-3

KNOW YOUR BLUE BRUTES

Your Blue Brute Distributor will gladly show you how Worthington-Ransome Blue Brute construction equipment will put your planning on a profitable basis and prove that *there's more worth in Worthington-Ransome.* Act now! His name is listed on page 00. The number beside his name indicates the Blue Brutes he handles.

1.

Blue Brutes include: Pavers, Concrete Spreaders**, Concrete Mixers, Concrete Placing Equipment, Big Mixers, Finishing Machines**, Pneumatic Placing & Grouting Equipment, Truck Mixers, Plaster & Bituminous Mixers, and accessories.

2.

Blue Brutes also include: Diesel, gasoline and electric driven Portable Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs; Rock Drills and Air Tools in a wide range of weights and sizes; Contractors' Pumps.**

**Postwar Products

BUY BLUE BRUTES

Truck Mixers
Capacities:
2, 3, 4½, 5¼ cu. yds.

Portable Mixers
Capacities:
3½, 7, 10, 14 cu. ft.

Big Stationary Mixers
Capacities:
28, 56, 84, 126 cu. ft.

Pneumatic Placer
Capacity:
7, 14, 28 cu. ft.

WORTHINGTON

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

6 lin. ft. st. reinf. conc. culv. pipe 30-in. diam. in place	10.00	8.00	7.50	8.00	6.50	5.20	10.00
9 lin. ft. st. reinf. conc. culv. pipe 36-in. diam. in place	20.00	10.50	10.50	10.00	10.00	8.50	15.00
Lump sum, construct and remove detour	300.00	$1,350	$3,000	$4,000	$1,000	$3,000	$1,000
REINFORCED CONCRETE BRIDGE							
190 cu. yd. structure excavation	5.00	6.00	6.00	10.00	7.00	4.50	4.00
51 cu. yd. concrete Class "A" in place	50.00	63.00	60.00	60.00	40.00	58.00	50.00
55 cu. yd. concrete Class "B" in place	45.00	45.00	60.00	60.00	40.00	45.00	45.00
85 lin. ft. reinf. conc. br. railing in place	7.00	7.50	12.50	6.00	5.00	9.50	7.00
17,000 lb. steel reinf. bars in place	.07	.10	.11	.08	.12	.08	.12
2 ea. bridge drains complete in place	50.00	60.00	40.00	75.00	50.00	35.00	.50
Lump sum, removing existing structure	300.00	300.00	350.00	600.00	500.00	650.00	300.00

California—Kern County—State—Surfacing

Lewis Construction Co., Los Angeles, submitted the low bid of $70,160 to the Division of Highways, Sacramento, for the resurfacing of 12 miles of Route 23 located 8 miles east of Inyokern, with plant mixed surfacing and applying seal coat thereto. The following is a summary of the unit bids submitted.

(1) Lewis Construction Co. $70,160
(2) Oswald Bros. 84,900
(3) Basich Bros. Construction Co. 86,741
(4) Tanner Construction Co. ..... $ 98,540
(5) Southwest Paving Company 104,587
(6) J. E. Haddock, Ltd. 107,000

	(1)	(2)	(3)	(4)	(5)	(6)
12.2 miles reshaping existing shoulders	25.00	250.00	180.00	300.00	500.00	200.00
2,500 cu. yd. imported borrow	.75	1.25	1.40	.90	1.50	1.00
Lump sum, dev. water supply and furn watering equipt.	500.00	$1,000	$1,500	200.00	200.00	250.00
250 M. gals. applying water	1.40	4.50	4.50	3.00	3.00	2.00
140 tons paving asphalt (seal coat)	22.50	19.00	21.00	22.00	35.00	15.00
1,260 tons screenings (seal coat)	1.50	2.50	3.00	5.00	5.00	3.00
70 tons asphaltic paint binder	50.00	47.00	60.00	40.00	50.00	24.00
19,500 tons mineral aggregate (P.M.S.)	2.17	2.60	2.60	3.00	3.10	4.00
1,050 tons paving asphalt (P.M.S.)	15.50	16.00	16.00	20.00	17.75	15.00

Washington—Jefferson County—State—Grade and Surf.

Joslin & McAllister, Spokane, was awarded the contract on the low bid of $64,907 to the Department of Highways, Olympia, for the construction of 6 mi. of the SR 9-E of the Center to Beaver Valley Road. Summary of the unit bids received follows:

(1) Joslin & McAllister $64,907
(2) Peter Kiewit and Sons Co. 68,829
(3) J. D. Shotwell $74,661
(4) L. Coluccio Co. 92,288

	(1)	(2)	(3)	(4)
260 cu. yd. structure excavation	1.50	2.75	3.00	2.00
160 cu. yd. backfill, includ. haul	2.00	2.00	3.00	2.50
6.2 mi. scarifying and shaping rdwy.	300.00	350.00	400.00	$1,500
4,320 cu. yd. cr. stone surf., top cr., in pl. on rdwy.	2.67	2.85	3.15	3.65
10,390 cu. yd. cr. stone surf., base cr., in pl. on rdwy.	2.67	2.55	3.05	3.60
1,560 cu. yd. cr. stone filler in pl., incl. haul	2.67	3.00	3.15	3.65
440 M. gal. water	2.00	2.00	3.00	3.50
1,670 cu. yd. cr. cover stone in stkpl.	2.67	3.00	3.57	3.35
MIN. AGGR. FOR NON-SKID SINGLE SEAL TREAT. SCH. A—IN STKPLS.				
1,030 cu. yd. cr. cr. screenings ⅝ to ¼-in. in stkpl.	2.67	3.50	4.12	3.65
310 cu. yd. fine cr. screenings ¼-in. to 0, in stkpl.	2.67	3.50	2.82	3.35
LIGHT BITUMINOUS SURFACE TREATMENT METHOD A				
6.2 mi. preparation, const. and finishing	2.00	3.00	2.00	3.50
180 tons bit. cement MC-2 in place	30.00	33.00	30.00	32.00
1,670 cu. yd. pl. cr. cover stone from stkpl.	2.00	2.25	1.00	2.00

Wyoming—Laramie County—State—Grade and Drain

Leach Bros., Cheyenne, were awarded the contract on the low bid of $304,490 by the Highway Department, Cheyenne, for the grading, draining, and miscellaneous work on 8.5 mi. of the Laramie-Cheyenne road. Unit bids received are as follows:

(A) Leach Bros. $304,490
(B) Brown Construction Co. 316,981
(C) Lowdermilk Bros. 344,791
(D) Big Horn Construction 376,241
(E) Gibbons & Reed Co. 391,270
(F) Taggert Construction Co. 399,472
(G) Inland Construction Co. $402,241
(H) J. J. Dooling 410,175
(I) Knisely-Moore 417,343
(J) Northwestern Engineering Co. 431,691
(K) Engineer's estimate 335,947

(1) 496,000 cu. yd. excavation.
(2) 60,000 cu. yd. sta. overhaul.
(3) 45,000 cu. yd. mi., cubic yard mile haul.
(4) 4,000 M. gal. watering (emb.)
(5) 1,900 hr. sheepsfoot roller operation.
(6) 1,150 hr. pneumatic tired roller operation.
(7) 200 cu. yd. excavation for pipe culverts.
(8) 200 cu. yd. structure excavation.
(9) 2,748 lin. ft. 18-in. std. R.C.P.
(10) 1,000 lin. ft. 24-in. std. R.C.P.
(11) 92 lin. ft. 36-in. std. R.C.P.
(12) 144 lin. ft. 48-in. std. R.C.P.
(13) 20 lin. ft. 24-in. extra strength R.C.P.
(24) 91,600 lin. ft. std. r/w fence (3 wires).
(25) 30 ea., end panels.
(26) 65 ea., brace panels.
(27) 420 hrs. mechanical tamping.
(28) 25 ea., r/w markers.
(29) 2 ea., R.C. project markers.
(30) 38.5 cu. yd. Class A concrete.
(31) 1,530 lb. reinforcing steel.
(32) 32,150 lb. structural steel.
(33) 2,000 lin. ft. portable snow fence.
(34) Lump sum, rem. and reset. forest serv. signs.
(35) 20 cu. yd. Class 1 riprap.
(36) 30 cu. yd. grouted riprap.
(37) 68 tons base treatment MC-1 (for detours).

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
(1)	.48	.47	.53	.59	.61	.66	.67	.695	.55	.70	.70
(2)	.015	.015	.015	.015	.015	.015	.015	.015	.015	.015	.015
(3)	.15	.25	.25	.15	.15	.25	.27	.20	.20	.20	.20
(4)	2.00	2.00	2.50	1.50	2.50	1.75	2.55	2.00	2.00	2.00	3.00
(5)	3.50	5.00	3.00	3.00	4.50	3.00	2.35	2.25	3.00	4.00	4.00
(6)	4.50	3.00	4.50	5.00	4.00	4.50	3.70	4.50	4.00	4.00	4.50
(7)	1.50	3.00	3.00	2.00	2.00	3.00	2.70	1.00	1.50	1.00	3.00
(8)	1.50	3.00	3.00	2.00	2.00	4.00	2.70	1.00	1.50	3.00	3.00
(9)	3.25	4.00	3.50	4.25	3.60	3.00	2.80	3.00	3.25	3.00	3.50
(10)	5.00	6.50	4.75	6.00	5.50	4.60	4.60	4.50	4.25	5.00	5.50
(11)	9.00	10.00	9.00	11.00	9.75	8.60	9.00	8.00	6.75	7.00	10.00
(12)	14.00	14.00	13.00	18.00	15.00	13.60	15.00	13.00	10.00	12.00	16.00
(13)	5.50	7.00	5.50	7.00	6.10	5.25	6.00	5.00	4.75	6.00	6.00
(24)	.10	.15	.14	.20	.25	.12	.105	.125	.075	.12	.14
(25)	9.00	10.00	12.50	15.00	10.00	13.50	14.00	9.00	8.00	8.00	13.00
(26)	7.00	7.00	7.50	10.00	6.50	8.00	9.50	6.00	6.00	6.00	9.00
(27)	4.00	4.00	4.50	7.00	4.50	5.00	3.35	2.00	3.00	2.50	3.50
(28)	4.00	5.00	6.00	10.00	5.00	10.00	20.00	6.00	8.00	10.00	25.00
(29)	20.00	50.00	25.00	20.00	10.00	20.00	27.00	20.00	20.00	25.00	25.00
(30)	35.00	50.00	45.00	50.00	40.00	40.00	40.00	35.00	33.00	40.00	50.00

(Continued on next page)

Construction Equipment

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EARTH MOVERS

210 to 215 — 6—Sterling Earth Movers, Model HCS297, 3 axle, 10 wheel, four wheel drive with 12 cu. yd. steel dump body with Heil Model OT 73-94 or Wood Model T440 hydraulic hoist. Powered by Cummins Engine Model H.D. w/15" single plate, WC Lipe Clutch. First sold new December 1941 to February 1942.

TRUCK CRANE

701 — Byers Crane—Model 83 w/Kohler Light Plant Model A25—800 watt, Gallineau refiner #125—16"—American S S Hook Block & Fire Extinguisher mounted on 1942 GMC Truck, Model AYX801—120" wheelbase, 5 speed main transmission, 1000 x 22 tires front and rear, ignition and carburetor safety device, frame stress absorber, 300 watt generator, notebook holder, Left and Right rear vision mirror, front wheel brake limiting air valve, gear shift device, Westinghouse separate air valve, low air pressure buzzer, air reservoir, brake flap adjusters, Budd wheels, responsive globe valve in fuel tank, auto winter radiator shield, drive shaft guard, pre-loaded brake valve, brake shield, rubber seat cushion, safety wiring, brake pressure gauge, Brown Lip auxiliary transmission, Maxi 6 wheel attachment w/chains and Model 600 Winslow filter. First sold—1943.

PAVERS

2319 — Multifoote Paver w/open-end loading skip 118" width and skip guards—2 speed reversible multifoote traction—60 gallon auxiliary tank, automatic Batcher operation—35 ft. inclined boom attachment w/controllable bucket and Hercules Power Unit Model RXLD. First sold—September 1944.

2343 — Ransome Paver Model 34E—Full length tractor with power loader, 32' 6" spreading reach and 60 gallon water storage tank. Has 6 cylinder Buda gas engine Model GF638. First sold—September 1941.

OUR No.

ROAD ROLLER & ROAD BROOM

2515—Buffalo-Springfield 10-12 ton Roller—3 wheel Hand Steering. First sold—June 1931.

2611 — Hough Road Broom w/6' 6" broom and Le Roi Engine—Type M3.

CARRYALLS

1011 — 4—Model TCR—18 yd. Wooldridge Scrapers. First sold—August 1944.

COMPRESSORS

1204 — Quincy #330 Compressor, cap. 30 cu. ft. w/Westinghouse 220/440—3 phase 5 H.P. motor. First sold—October 1944.

LIGHTING PLANTS

1310 — Oman Portable Lighting, Model W3—S50—3 kw.—110 volt. First sold—August 1944.

1311 1320 to 1324 — 6—Fairbanks-Morse Portable Lighting Plants. Model W3—S50—3 kw.—AC. First sold—October 1944.

1333 1335 — 2—Fairbanks-Morse Portable Lighting Plants. Model W3—S50—110 volt AC. First sold—August 1944.

1339 — Kohler Portable Lighting Plant, Model L, 2 kw.—DC—115 volt. First sold—August 1944.

1340 — Kohler Portable Light Plant, Model 1M21-O, 1½ kw.—DC—115 volt. First sold—August 1944.

POWER CONTROL UNIT

2646—3—LeTourneau Model R8 Double Drum Power Control Units all w/double-deck sheave assemblies. First sold—October 1944.

Also—GASOLINE AND ELECTRIC PUMPS • CHAIN HOISTS • GASOLINE SAW RIGS • RODDING AND FINISHING MACHINES • TAMPERS • PAVING BREAKERS • JACK HAMMERS • CLAY SPADES • CHIPPING GUNS • SKILL-SAW • ELECTRIC AND GASOLINE VIBRATORS • ELECTRIC DRILLS • CONCRETE BUCKETS • VISES • BATTERY CHARGERS • VALVE GRINDERS • DRILL PRESS

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(31)	.10	.20	.12	.10	.08	.10	.12	.10	.10	.10	.10
(32)	.10	.20	.15	.15	.10	.11	.08	.10	.12	.15	.12
(33)	1.10	.30	2.00	1.23	2.40	1.20	.80	1.00	1.00	.60	2.50
(34)	50.00	50.00	250.00	$1,000	50.00	300.00	100.00	200.00	60.00	100.00	100.00
(35)	5.00	10.00	12.50	6.00	10.00	6.50	10.50	4.00	5.00	5.00	6.00
(36)	10.00	20.00	15.00	12.00	18.00	9.00	20.00	6.00	8.00	8.00	10.00
(37)	30.00	30.00	40.00	35.00	30.00	30.00	25.50	24.00	30.00	30.00	35.00

New Mexico—Bernalillo County—State—Grade and Surf.

D. D. Skousen, Albuquerque, submitted the low bid of $40,876 to the State Highway Department, Santa Fe, for the construction of 7.5 mi. of the Miera-Chilili Section of SR 10. Five bidders submitted the following unit bids for the project:

(1) D. D. Skousen $40,876
(2) M. M. Sundt Construction Co. 41,662
(3) Littlefield Construction Co. 44,834
(4) Allison & Armstrong $51,438
(5) Miller and Smith 54,451

	(1)	(2)	(3)	(4)	(5)
Lump sum, removal of old drainage structures	200.00	100.00	200.00	200.00	60.00
50 cu. yd. excavation for pipe culverts	2.00	1.00	2.50	3.00	1.50
290 hr. rolling—steel tired roller	3.00	4.50	5.50	5.00	6.00
2,063 cu. yd. surface plating course	.90	.45	1.00	.70	.48
500 M. gal. watering	2.00	2.50	3.50	6.00	3.00
152 lin. ft. std. reinf. conc. culvert pipe—36-in. diam.	10.00	8.68	9.00	12.00	12.00
7.3 mi. blading and shaping	300.00	500.00	300.00	300.00	780.00
14,960 cu. yd. base course surfacing	1.90	1.95	2.05	2.40	2.49
0.20 mi. grading	$5,000	500.00	$4,000	$8,000	$1,840

Oregon—Union County—State—Stockpile

Newport, Kern & Kibbe, Portland, submitted the low bid of $25,125 to the State Highway Department, Salem, for the preparation and stockpiling of 10,900 cu. yd. of crushed rock road material. Unit bids submitted are as follows:

(1) Newport, Kern & Kibbe $25,125
(2) Arthur Gentemann 26,415
(3) D. C. & A. L. Williams 26,425
(4) Rogers Construction Co. $26,764
(5) R. O. Dail 30,575

	(1)	(2)	(3)	(4)	(5)
4,700 cu. yd. ¾-in. - ½-in. crushed material in stockpile	2.25	2.35	2.40	2.40	2.75
3,710 cu. yd. ½-in. - ¼-in. crushed material in stockpile	2.25	2.35	2.40	2.40	2.75
2,490 cu. yd. ¾-in. - 0-in. crushed material in stockpile	2.25	2.35	2.40	2.00	2.75
All specified clearing and grubbing of stockpile sites	300.00	400.00	125.00	800.00	300.00
All specified leveling of stockpile sites	300.00	400.00	140.00	800.00	300.00

Irrigation . . .

New Mexico—Quay County—Bureau of Reclam.—Earthwork & Structs.

Clyde W. Wood Inc., submitted the low bid of $639,935 for both Schedules to the Tucumcari Office of the Bureau of Reclamation for the construction of earthwork and structures on the Conchas Canal from Sta. 3188 plus 52 to 3239 plus 70, 3243 plus 45 to 3288 plus 20 and 3293 plus 70 to 3341 plus 25. Also Hudson Canal Stations 1 plus 35 to 90 plus 05, 136 plus 60 to 418 plus 80, as specified in Abstract No. 1107. Unit bids are Lsted below.

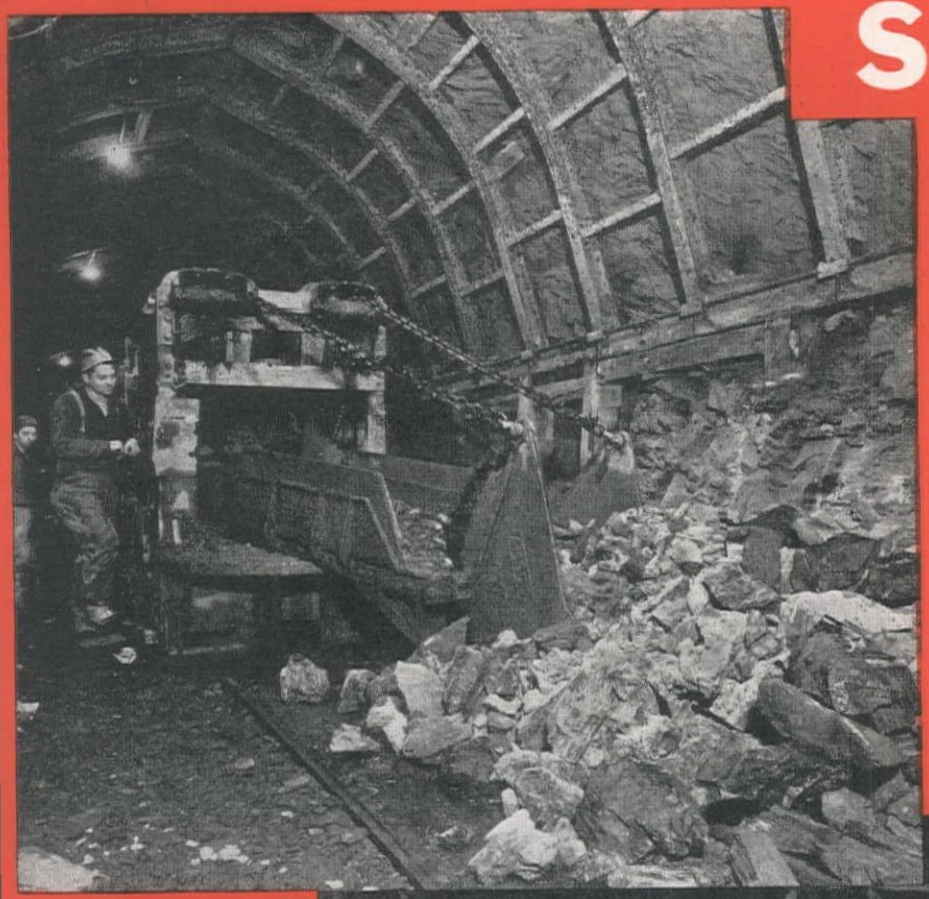
	Schedule No. 1	Schedule No. 2	Schedules No. 1 & 2
(A) A. S. Horner	No Bid	$252,934.00	
(B) Clyde W. Wood, Inc.	$285,865.20	354,070.40	$639,935.60
(C) Morrison-Knudsen Co., Inc. and M. H. Hasler	282,641.00	479,836.00	762,477.00
(D) Grafe-Callahan Const. Co. and Gunther & Shirley	362,848.00	No Bid	
(E) J. A. Terteling and Sons, Inc.	455,354.00	443,496.00	898,850.00

Stipulations:

(1) A. S. Horner—None.
(2) Clyde W. Wood, Inc.—We will accept Schedules No. 1 and No. 2 as a whole. We will accept Schedule No. 1 alone. We will not accept Schedule No. 2 alone.
(3) Morrison-Knudsen Co., Inc. and M. H. Hasler—This bid is submitted on the basis of awarding both Schedules or none.
(4) Grafe-Callahan Const. Co. and Gunther & Shirley—None.
(5) J. A. Terteling and Sons, Inc.—None.

	(A)	(B)	(C)	(D)	(E)
591,000 cu. yd. excavation, common for canal		.22	.18	.12	.245
101,000 cu. yd. excavation, rock, for canal		.22	.18	.60	.245
64,000 cu. yd. excavation, for core banks		.22	.25	.20	.20
90,000 sta. yd. overhaul		.01	.03	.02	.02
15,000 cu. yd. compacting embankments		.29	.18	.30	.75
268,000 cu. yd. compacting fill for Hudson Canal		.29	.33	.57	.825
2,100 cu. yd. excavation, common, for drainage chan. and dikes		.50	.25	.50	.50
600 cu. yd. excavation, rock, for drainage channels and dikes		.50	1.00	1.50	2.00
2,000 cu. yd. excavation, common, for structures		2.00	1.60	2.00	1.00
500 cu. yd. excavation, rock, for structures		2.00	1.60	5.00	2.00
1,400 cu. yd. backfill		.50	.50	.40	.30
1,400 cu. yd. compacting backfill		1.75	3.00	4.50	3.50
384 cu. yd. concrete in structures		54.50	77.00	90.00	50.00
36,500 lbs. placing reinforcement bars		.04	.05	.10	.04
250 sq. yd. dry-rock paving		3.00	5.50	5.00	5.00
2 M.B.M. erecting timber in structures		150.00	150.00	100.00	100.00
28 lin. ft. laying 15-in. diam. concrete pipe		1.00	2.00	2.00	2.00
392 lin. ft. laying 18-in. diam. concrete pipe		1.50	2.00	2.00	2.00
28 lin. ft. laying 21-in. diam. concrete pipe		2.00	2.00	3.00	2.50
28 lin. ft. laying 24-in. diam. concrete pipe		2.40	2.50	3.00	2.50
76 lin. ft. laying 30 in. diam. concrete pipe		3.00	2.50	5.00	3.00
56 lin. ft. laying 36-in. diam. concrete pipe		3.50	3.50	5.00	3.50
56 lin. ft. laying 42-in. diam. concrete pipe		4.00	3.50	5.00	5.00
15,000 lbs. installing gates and misc. metal work		.15	.24	.17	.30
5,200 cu. yd. excavation, common, for canal	.40	.22	.18		.20
1,200 cu. yd. excavation, rock, for canal	.40	.22	.18		1.00
200 cu. yd. excavation, for core banks	.35	.22	.25		.25
20,000 sta. yd. overhaul	.03	.01	.03		.03
76,400 cu. yd. excavation, common, for structures	.45	.38	.68		.50
20,000 cu. yd. excavation, rock, for structures	.45	.38	.68		1.25
74,000 cu. yd. backfill	.20	.18	.31		.20
6,700 cu. yd. compacting backfill	1.50	1.75	2.90		3.50
6,718 cu. yd. concrete in structures	22.50	37.30	46.50		42.00
1,135,000 lbs. placing reinforcement bars	.023	.03	.41		.03
500 sq. yd. dry-rock paving	3.00	3.00	5.50		5.00
34,400 lbs. placing metal water stops in joints	.06	.10	.20		.50
6,500 lbs. installing gates and miscel. metal work	.10	.18	.24		.50

THE CONWAY MUCKING SHOVEL



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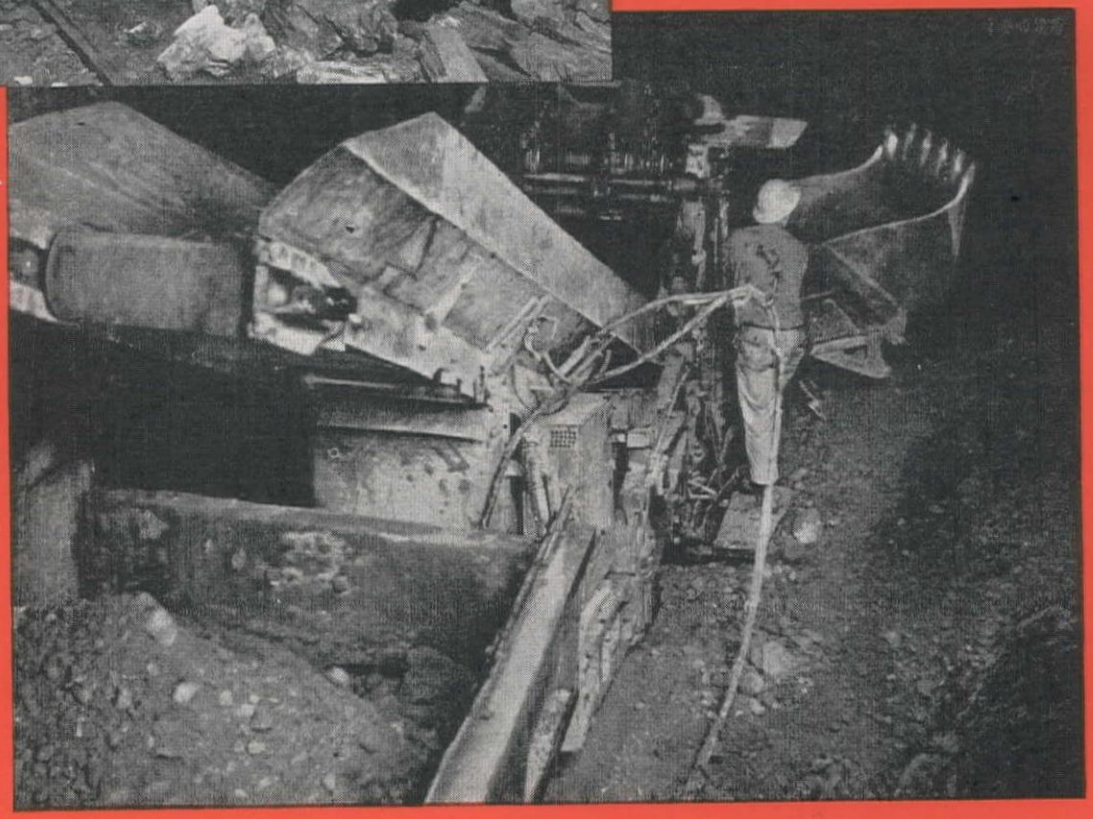
There is a Conway for any size tunnel. A Goodman Sales Engineer can give you details.



12137 The Type 75 Conway mucking out rock in a New York tunnel job (above) and in a California tunnel (right). **14422**

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Locomotives • Loaders • Cutting Machines • Conveyors

Nebraska—Sheridan County—Bureau of Reclam.—Earthwork & Structs.

Trione Contracting Co., Denver, Colorado, submitted the low bid of $81,362 to the Bureau of Reclamation office in Henningford, Nebraska, for the construction of earthwork and structures of Mirage Flats lateral and sub-laterals as stipulated in Specification No. 1105. Work quantities and unit bids received for the project are as follows:

(1) Trione Contracting Co. $81,362
(2) Malcolm G. Long 85,712
(3) Roush Construction Co. ..... $ 90,812
(4) Steinwald and Watts 162,655

	(1)	(2)	(3)	(4)
105,000 cu. yd. excavation for laterals	.28	.30	.28	.65
40,000 sta. cu. yd. overhaul	.02	.02	.02	.03
5,000 cu. yd. compacting embankment	.30	.40	.50	.30
5,000 cu. yd. excavation for structures	1.50	2.00	1.65	2.50
3,000 cu. yd. backfill	.40	.333	.35	1.50
1,600 cu. yd. compacting backfill	1.25	1.00	1.00	4.00
450 sq. yd. dry rock paving	4.00	5.00	5.50	30.00
615 cu. yd. concrete in structures	48.00	47.50	55.00	65.00
50,000 lbs. placing reinforcement bars	.05	.04	.06	.07
13 M.B.M. erecting timber in structures	75.00	75.00	100.00	125.00
650 lin. ft. laying 18-in. dia. concrete pile	1.25	1.50	2.00	4.50
420 lin. ft. laying 24-in. dia. concrete pipe	1.75	2.00	2.60	5.00
360 lin. ft. laying 30-in. dia. concrete pipe	2.50	2.50	3.25	6.00
120 lin. ft. laying 36-in. dia concrete pipe	3.50	3.00	3.75	8.00
13,000 lbs. installing gates and misc. metalwork	.10	.10	.20	.12

Water Supply . . .

California—San Diego County—U. S. Navy Public Works—Conc. Pipeline

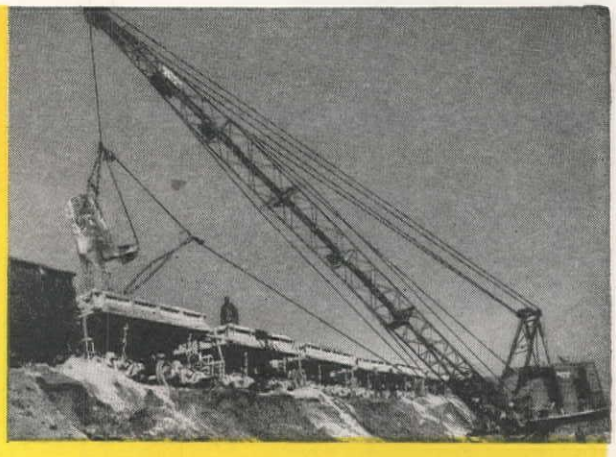
United Concrete Pipe Corp., Los Angeles, submitted the lowest bid of $3,361,088 to the U. S. Navy, Public Works Office in San Diego, for the construction of concrete pipeline, concrete manholes, vents, blowoff, and risers on the San Diego aqueduct between mile 29.9 and 46.8 as specified in No. 17,270 NOy 13095.

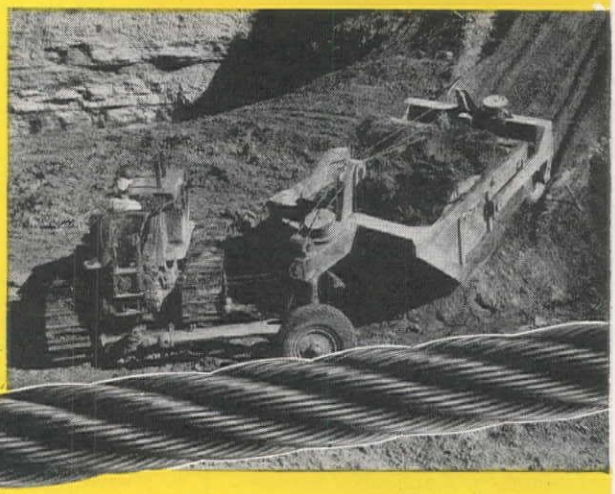
(A) United Concrete Pipe Corp. $3,361,088
(B) L. E. Dixon Co. 3,944,009
(C) Bressi-Brevenda Constr. Co. 4,211,966
(D) S. A. Healy Co. $4,276,750
(E) Haddock Engineers 4,687,467
(F) Guy F. Atkinson Co. 4,756,090

(1) 160,000 cu. yd. excav. N. Sta. 1146 plus 00 to 1505 plus 00
(2) 90,000 cu. yd. excav. N. Sta. 1505 plus 00 to 1555 plus 003 and 1851 plus 00 to 1919 plus 50
(4) 50,000 cu. yd. excav. No. Sta. 1555 plus 00 to 1692 plus 00
(5) 55,000 cu. yd. excav. No. Sta. 1692 plus 00 to 1764 plus 00
(6) 35,000 cu. yd. excav. No. Sta. 1811 plus 00 to 1851 plus 00
(7) 230,000 cu. yd. excav. No. Sta. 1968 plus 00 to 2101 plus 00, 2109 plus 00 to 2186 plus 00 and 2191 plus 00 to 2413 plus 00 and S. Sta. 1436 plus 80.40 to 1431 plus 00
(8) 50,000 cu. yd. excav. So. Sta. 1431 plus 00 to 1421 plus 50 and 1391 plus 50 to 1375 plus 50
(9) 23,000 cu. yd. excav. S. Sta. 1375 plus 50 to 1339 plus 50
(10) 2,000 cu. yd. excav., road relocation
(11) 400,000 cu. yd. backfill
(12) 22,000 cu. yd. compacting backfill
(13) 100 acres, scarifying r/w
(14) 100 acres, seeding r/w
(15) 50 lin. ft. furn. and lay. 42-in. precase concr. culv. pipe
(16) 50 lin. ft. furn. and lay 30-in., same
(17) 40 lin. ft. furn. and lay 12-in., same
(18) 3,400 lin. ft. furn. and lay 6-in. sewer pipe
(19) 150 sq. yd. dry-rock paving
(20) 1,600 cu. yd. conc. in structs., except cement
(21) 222,000 lbs. furn. and place reinf. bars in structs.
(22) 100 lin. ft. furn. and place rubber wat. stops
(23) 48,000 lbs. furn and inst. nozzles and covers
(24) 92,000 lbs. furn. and inst. CIP and fittings
(25) 2 ea. furn. and inst. 16-in. valves.
(26) 25 ea. furn. and inst. 6-in. valves.
(27) 17 each furn. and inst. 4-in. air valves
(28) 57,000 lbs. furn. and inst. misc. metal work
(29) 1,700 lin. ft. furn. and erect chain link fence
(30) 4 ea. furn. and inst. anchor block pipe
(31) 2 each furn. and inst. reducer pipe
(32) 890 lin. ft. conc. pipe, symbol A-72NC 50
(33) 5,100 lin. ft. conc. pipe, symbol B-72NC50
(34) 2,750 lin. ft. conc. pipe, symbol C-72NC50
(35) 1,100 lin. ft. conc. pipe, symbol D-72NC50
(36) 80 lin. ft. conc. pipe, symbol E-72NC50
(37) 420 lin. ft. conc. pipe symbol B-72NC75
(38) 60 lin. ft. conc. pipe, symbol C-72NC75
(39) 90 lin. ft. conc. pipe symbol A-72NC100
(40) 490 lin. ft. conc. pipe, symbol B-72NC280
(41) 280 lin. ft. conc. pipe, symbol A-72C125
(42) 100 lin. ft. conc. pipe, symbol C-72C125
(43) 70 lin. ft. conc. pipe, symbol A-72C150
(44) 70 lin. ft. conc. pipe, symbol D-72C150
(45) 80 lin. ft. conc. pipe, symbol E-72C150
(46) 360 lin. ft. conc. pipe, symbol B-72C175
(47) 70 lin. ft. conc. pipe, symbol D-72C175
(48) 80 lin. ft. conc. pipe, symbol B-72C200
(49) 90 lin. ft. conc. pipe, symbol D-72C200
(50) 570 lin. ft. conc. pipe, symbol B-72C225
(51) 80 lin. ft. conc. pipe, symbol C-72C225
(52) 60 lin. ft. conc. pipe, symbol D-72C225
(53) 1,100 lin. ft. conc. pipe, symbol B-72C250
(54) 210 lin. ft. conc. pipe, symbol C-72C250
(55) 470 lin. ft. conc. pipe, symbol C-72C275
(56) 70 lin. ft. conc. pipe, symbol D-72C275
(57) 2,030 lin. ft. conc. pipe, symbol A-54NC50
(58) 4,260 lin. ft. conc. pipe, symbol B-54NC50
(59) 1,060 lin. ft. conc. pipe, symbol C-54NC50
(60) 360 lin. ft. conc. pipe, symbol D-54NC50
(61) 1,450 lin. ft. conc. pipe, symbol A-54NC75
(62) 3,680 lin. ft. conc. pipe, symbol B-54NC75
(63) 360 lin. ft. conc. pipe, symbol C-54NC75
(64) 180 lin. ft. conc. pipe, symbol D-54NC75
(65) 4,760 lin. ft. conc. pipe, symbol A-54NC100
(66) 2,030 lin. ft. conc. pipe, symbol B-54NC100
(67) 550 lin. ft. conc. pipe, symbol C-54NC100
(68) 440 lin. ft. conc. pipe, symbol D-54NC100
(69 4,150 lin. ft. conc. pipe, symbol A-54C125
(70) 3,850 lin. ft. conc. pipe, symbol B-54C125
(71) 1,480 lin. ft. conc. pipe, symbol S-54C125
(72) 420 lin. ft. conc. pipe, symbol D-54C125
(73) 4,150 lin. ft. conc. pipe, symbol A-54C150
(74) 5,000 lin. ft. conc. pipe, symbol B-54C150
(76) 270 lin. ft. conc. pipe, symbol D-54C150
(75) 640 lin. ft. conc. pipe, symbol C-54C150
(77) 100 lin. ft. conc. pipe, symbol E-54C150
(78) 6,700 lin. ft. conc. pipe symbol B-54C175
(79) 820 lin. ft. conc. pipe, symbol C-54C175
(80) 170 lin. ft. conc. pipe, symbol D-54C175
(81) 7,600 lin. ft. conc. pipe, symbol B-54C200
(82) 260 lin. ft. conc. pipe, symbol C-54C200
(83) 110 lin. ft. conc. pipe, symbol D-54C200
(84) 8,200 lin. ft. conc. pipe, symbol C-54C225
(85) 170 lin. ft. conc. pipe, symbol D-54C225
(86) 3,700 lin. ft. conc. pipe, symbol C-54C250
(87) 1,030 lin. ft. conc. pipe, symbol C-54C275
(88) 630 lin. ft. conc. pipe, symbol D-54C300
(89) 230 lin. ft. conc. pipe, symbol D-54C325
(90) 210 lin. ft. conc. pipe, symbol 54-C350
(91) 250 lin. ft. conc. pipe, symbol 54-C375
(92) 630 lin. ft. conc. pipe, symbol 54-C400
(93) 500 lin. ft. conc. pipe, symbol 54-C450
(94) 770 lin. ft. conc. pipe, symbol 54-C500
(95) 350 lin. ft. conc. pipe, symbol 54-C550
(96) 120 lin. ft. conc. pipe, symbol A-48NC50
(97) 310 lin. ft. conc. pipe, symbol B-48NC50
(98) 50 lin. ft. conc. pipe, symbol C-48NC50
(99) 820 lin. ft. conc. pipe, symbol A-48NC75
(100) 1,630 lin. ft. conc. pipe, symbol B-48NC75
(101) 260 lin. ft. conc. pipe, symbol C-48NC75
(102) 340 lin. ft. conc. pipe, symbol B-48NC100
(103) 520 lin ft. conc. pipe, symbol A-48C125
(104) 480 lin. ft. conc. pipe, symbol B-48C125
(105) 260 lin. ft. conc. pipe, symbol A-48C150
(106) 170 lin. ft. conc. pipe, symbol B-48C150
(107) 110 lin. ft. conc. pipe, symbol C-48C150
(108) 1,900 lin. ft. conc. pipe, symbol B-48C175
(109) 100 lin. ft. conc. pipe, symbol C-48C175
(110) 2,080 lin. ft. conc. pipe, symbol B-48C200
(111) 60 lin. ft. conc. pipe, symbol C-48C200
(112) 870 lin. ft. conc. pipe, symbol B-48C225
(113) 150 lin. ft. conc. pipe, symbol C-48C225
(114) 140 lin. ft. conc. pipe, symbol D-48C225
(115) 760 lin. ft. conc. pipe, symbol B-48C250
(116) 220 lin. ft. conc. pipe, symbol C-48C250
(117) 250 lin. ft. conc. pipe, symbol D-48C250
(118) 1,680 lin. ft. conc. pipe, symbol C-48C275
(119) 140 lin. ft. conc. pipe, symbol D-48C275
(120) 4,160 lin. ft. conc. pipe, symbol C-48C300
(121) 4,100 lin. ft. conc. pipe, symbol C-48C325
(122) 100 lin. ft. conc. pipe, symbol D-48C325
(123) 410 lin. ft. conc. pipe, symbol C-48C350
(124) 1,250 lin. ft. conc. pipe, symbol D-48-C350
(125) 540 lin. ft. conc. pipe, symbol 48C375
(126) 630 lin. ft. conc. pipe, symbol 48C400
(127) 1,090 lin. ft. conc. pipe, symbol 48C450
(128) 460 lin. ft. conc. pipe, symbol 48C500
(129) 58,000 bbls. furn. and hand. modified Portland cement.
(130) 2,000 bbls. furn cement.

(Continued on next page)

Wire rope performance is a big factor in determining project profits





THAT'S why it is important to consider the service you can expect from your hauling, hoisting and dragline cables before you begin another job.

By rigging with U·S·S American Tiger Brand Excellay Preformed Wire Rope you increase the efficiency of your men and equipment, reduce lay-up time and speed the job's completion.

Strong, tough and flexible, Tiger Brand is built to resist bending fatigue and early wear when operated at fast speeds over small sheaves and drums. It is safer to work with because broken wires lie flat and in place instead of "porcupining."

The Excellay Preformed construction also makes this superior cable easier to handle . . . enables you to install it faster.

Because more and more Tiger Brand Wire Rope is being made available for civilian use, it will pay you to keep in touch with your supplier. He may have just what you want when you need it.

Excellay Preformed

COLUMBIA STEEL COMPANY
San Francisco · Los Angeles · Portland · Seattle · Salt Lake City
AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
United States Steel Export Company, New York
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UNITED STATES STEEL
Presents The Theatre Guild On the Air
Every SUNDAY EVENING
AMERICAN Network (Blue)

USS STEEL
UNITED STATES STEEL

U·S·S AMERICAN
TIGER BRAND *Wire Rope*

	(A)	(B)	(C)	(D)	(E)	(F)
(1)	1.00	1.10	1.05	1.42	1.43	1.00
(2)	1.30	1.70	1.05	1.42	3.00	2.25
(3)	.....	.....	.....	.....	.....	.....
(4)	1.30	1.20	1.05	1.42	1.48	1.50
(5)	1.30	2.20	1.05	1.42	2.66	2.90
(6)	1.30	1.50	1.05	1.42	1.50	2.90
(7)	1.30	1.62	1.05	1.42	1.75	1.35
(8)	1.60	2.30	1.05	1.42	1.90	1.25
(9)	1.60	1.60	1.05	1.42	3.66	2.00
(10)	1.30	1.90	1.25	2.00	1.94	.65
(11)	.21	.93	.40	.60	.45	.60
(12)	2.50	1.77	3.00	2.00	3.39	3.50
(13)	30.00	13.50	25.00	20.00	100.00	16.00
(14)	40.00	21.25	35.00	30.00	100.00	11.00
(15)	10.00	11.00	8.00	12.00	14.50	12.50
(16)	8.00	7.60	5.00	9.00	9.50	7.50
(17)	3.00	3.00	3.00	4.00	3.75	2.50
(18)	1.00	1.00	1.00	1.00	1.45	1.50
(19)	10.00	5.00	5.00	5.00	8.85	7.00
(20)	50.00	50.00	63.70	50.00	65.00	65.00
(21)	.08	.06	.08	.08	.09	.08
(22)	3.00	3.00	2.00	7.00	1.50	2.00
(23)	.30	.30	.30	.30	.44	.45
(24)	.10	.08	.15	.10	.10	.14
(25)	400.00	440.00	450.00	750.00	428.00	440.00
(26)	100.00	84.40	100.00	70.00	85.00	80.00
(27)	160.00	157.00	150.00	150.00	208.00	175.00
(28)	.30	.32	.35	.25	.36	.27
(29)	2.50	2.00	2.00	4.00	3.20	3.50
(30)	600.00	450.00	500.00	600.00	598.75	550.00
(31)	400.00	450.00	250.00	400.00	341.25	300.00
(32)	19.80	20.69	28.65	25.00	25.56	29.00
(33)	20.88	21.31	29.73	27.00	26.33	30.50
(34)	22.40	22.08	31.25	28.00	27.29	31.00
(35)	23.62	23.52	32.47	29.00	29.84	32.50
(36)	27.63	25.84	36.48	33.00	31.96	35.50
(37)	22.23	21.93	31.08	28.00	27.10	30.50
(38)	23.46	22.65	32.31	29.00	28.00	31.50
(39)	22.07	21.88	30.92	28.00	27.04	30.50
(40)	23.17	22.50	32.02	29.00	27.80	31.00
(41)	23.15	23.89	32.00	28.00	29.54	33.00
(42)	26.29	25.23	35.14	32.00	31.20	34.50
(43)	24.54	24.40	33.39	30.00	30.18	33.50
(44)	29.21	27.08	38.06	35.00	33.50	37.00
(45)	31.47	28.83	40.32	37.00	35.69	39.00
(46)	26.15	25.33	35.00	31.00	31.33	35.50
(47)	30.23	27.54	39.08	36.00	34.09	37.50
(48)	27.85	26.20	36.70	33.00	32.41	36.00
(49)	31.17	28.06	40.02	37.00	34.73	38.00
(50)	29.45	27.13	38.30	35.00	33.58	37.50
(51)	30.35	27.65	39.20	35.00	34.21	38.00
(52)	33.22	28.68	42.07	38.00	35.49	39.00
(53)	30.70	27.80	39.55	36.00	34.40	38.00
(54)	31.69	28.37	40.54	37.00	35.11	38.50
(55)	32.65	28.93	41.50	38.00	35.81	39.50
(56)	34.32	29.81	43.17	40.00	36.90	40.50
(57)	13.45	15.54	21.10	19.00	19.44	21.50
(58)	14.12	15.90	21.77	20.00	19.88	22.00
(59)	18.69	16.21	26.34	24.00	20.25	22.00
(60)	15.05	16.68	23.15	21.00	20.84	22.50
(61)	14.07	15.90	21.72	20.00	19.88	22.00
(62)	14.68	16.21	22.33	20.00	20.26	22.00
(63)	15.36	16.63	23.01	20.00	20.78	22.50
(64)	15.84	16.93	23.49	21.00	21.16	23.00
(65)	14.88	16.32	22.53	20.00	20.39	23.00

	(A)	(B)	(C)	(D)	(E)	(F)
(66)	15.33	16.63	22.98	21.00	20.78	22.50
(67)	15.92	16.93	23.57	21.00	21.16	23.00
(68)	16.50	17.35	24.15	22.00	21.68	23.50
(69)	15.17	17.40	22.82	21.00	21.74	24.00
(70)	15.65	17.66	23.30	21.00	22.06	24.00
(71)	16.67	18.27	24.32	22.00	22.83	24.50
(72)	17.56	19.10	25.21	23.00	23.85	26.00
(73)	16.11	17.96	23.76	22.00	22.43	25.00
(74)	16.75	18.33	24.40	22.00	22.89	25.50
(75)	17.36	18.69	25.01	23.00	23.34	25.50
(76)	18.32	19.36	25.97	24.00	24.18	26.00
(77)	20.05	20.02	27.70	26.00	25.00	27.00
(78)	17.45	18.69	25.10	23.00	23.34	26.00
(79)	18.32	19.05	25.97	24.00	23.79	25.50
(80)	18.87	19.56	26.52	25.00	24.43	26.50
(81)	18.02	19.00	25.67	24.00	23.73	26.00
(82)	18.56	20.26	26.21	24.00	24.05	26.00
(83)	19.44	19.77	27.09	25.00	24.69	26.50
(84)	18.96	19.51	26.61	25.00	24.36	26.50
(85)	19.93	21.13	27.58	26.00	25.14	27.00
(86)	19.95	20.03	27.60	26.00	25.00	27.00
(87)	20.80	20.54	28.45	26.00	25.64	27.50
(88)	21.80	21.01	29.45	27.00	26.23	28.00
(89)	22.61	21.52	30.26	28.00	26.86	29.00
(90)	23.63	22.04	31.28	29.00	27.50	29.50
(91)	24.55	22.55	32.20	30.00	28.14	30.00
(92)	25.45	23.12	33.10	31.00	28.85	31.00
(93)	27.30	24.20	34.95	33.00	30.20	32.00
(94)	29.10	25.33	36.75	35.00	31.60	33.50
(95)	31.00	26.42	38.66	37.00	32.95	35.00
(96)	11.00	14.16	18.25	16.00	17.71	20.00
(97)	11.37	14.47	18.62	17.00	18.10	20.50
(98)	14.80	14.83	22.05	20.00	18.55	21.00
(99)	13.21	14.42	20.46	19.00	18.04	20.50
(100)	12.00	14.78	19.26	18.00	18.49	21.00
(101)	12.63	15.09	19.88	18.00	18.88	21.50
(102)	12.55	15.03	19.80	18.00	18.80	21.50
(103)	12.66	15.96	19.91	18.00	19.96	22.50
(104)	13.05	16.17	20.30	19.00	20.21	22.50
(105)	13.08	16.17	20.33	19.00	20.21	22.50
(106)	13.22	16.27	20.47	19.00	20.35	23.00
(107)	14.10	16.78	21.35	19.00	20.99	23.50
(108)	13.95	16.73	21.20	20.00	20.93	23.50
(109)	14.76	17.15	22.01	20.00	21.43	24.00
(110)	14.58	17.09	21.83	20.00	21.37	24.00
(111)	14.90	17.25	22.16	21.00	21.56	24.00
(112)	15.32	17.40	22.57	21.00	21.75	24.50
(113)	15.68	17.61	22.93	21.00	22.01	24.50
(114)	16.48	18.02	23.73	22.00	22.53	25.00
(115)	16.05	17.81	23.30	22.00	22.26	25.00
(116)	16.47	18.04	23.72	22.00	22.55	25.00
(117)	16.90	18.38	24.15	23.00	22.98	25.50
(118)	16.83	18.23	24.08	22.00	22.78	25.50
(119)	17.25	18.48	24.50	23.00	23.10	25.50
(120)	17.52	18.64	24.77	23.00	23.29	26.50
(121)	18.27	19.05	25.52	24.00	23.80	27.00
(122)	18.27	19.05	25.52	24.00	23.80	26.50
(123)	19.08	19.46	26.33	25.00	24.31	27.00
(124)	19.11	19.46	26.36	25.00	24.31	27.00
(125)	19.80	19.93	27.05	25.00	24.89	27.50
(126)	20.52	20.29	27.77	26.00	25.34	27.50
(127)	22.00	21.21	29.26	28.00	26.50	28.50
(128)	23.30	22.09	30.55	29.00	27.59	29.50
(129)	2.25	2.25	2.30	2.50	2.87	2.50
(130)	2.45	2.50	2.34	2.75	3.20	2.75

California—San Diego County—U. S. Navy—Syphon

Haddock Engineers, Ltd., Los Angeles, offered the low bid of $640,856 to the U. S. Navy, Public Works Office, San Diego, for the construction of steel syphons and structures as specified in No. 17,383, NOy 13,215 of the San Diego aqueduct. Unit bids received are as follows:

(A) Haddock Engineers, Ltd. $640,856
(B) Macco Construction Co. 649,543
(C) Concrete Pipe Constructors..... 695,700
(D) J. S. Barrett 743,645
(E) United Concrete Pipe $747,800
(F) Artukovich Bros. 863,740
(G) Bressi-Brevanda 888,271
(H) S. A. Healy..... 945,400

(1) 2000 cu. yd. excav., N. Sta. 1919-50 to N. Sta. 1929-35.
(2) 4000 cu. yd. excav., N. Sta. 1929-35 to N. Sta. 1948-00.
(3) 5000 cu. yd. excav., N. Sta. 1948-00 to N. Sta. 1968-00.
(4) 3000 cu. yd. excav., N. Sta. 2101-00 to N. Sta. 2109-00.
(5) 1000 cu. yd. excav., S. Sta. 657-50 to S. Sta. 661-00.
(6) 6000 cu. yd. excav., S. Sta. 661,00 to S. Sta. 681-00.
(7) 3000 cu. yd. excav., S. Sta. 681-00 to S. Sta. 693-50.
(8) 18,700 cu. yd. backfill.
(9) 5500 cu. yd. compacting backfill.
(10) 700 sq. yd. dry-rock paving.
(11) 1400 cu. yd. concrete in structs.
(12) 112,000 lbs. furn. and place reinf. bars in structs.
(13) 11,000 lbs. furn. and instal. blow-off and drain piping.
(14) 4 valves furn. and instal. 6-in. valves.
(15) 8,000 lbs. furn. and instal. misc. metal work.
(16) lump sum furn., instal., and testing 48-in. dia. welded plate-steel pipe.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
(1)	5.51	4.13	5.95	2.15	9.00	20.00	15.00	5.00
(2)	4.58	6.00	2.85	4.85	9.00	12.00	2.50	15.00
(3)	.94	.95	4.35	2.15	9.00	10.00	2.50	5.00
(4)	2.16	2.10	4.20	2.80	9.00	15.00	2.50	5.00
(5)	2.15	2.67	4.00	2.15	9.00	20.00	5.00	5.00
(6)	4.34	6.00	2.50	2.60	9.00	12.00	2.50	15.00
(7)	.94	.50	4.10	2.15	9.00	15.00	2.50	5.00
(8)	1.34	.40	2.25	.75	.50	1.00	1.25	3.00
(9)	2.72	4.00	5.30	3.00	3.50	2.50	4.00	4.00
(10)	8.15	6.00	9.50	3.60	10.00	10.00	10.00	10.00
(11)	39.12	40.00	36.00	45.00	45.00	60.00	60.00	50.00
(12)	.10	.07	.11	.10	.10	.10	.10	.10
(13)	.20	.30	.60	.15	.20	.15	.30	.50
(14)	178.75	100.00	285.00	150.00	150.00	110.00	125.00	100.00
(15)	.50	.35	.70	.35	.40	.25	.40	.40
(16)	$450,720	$462,043	$452,815	$564,300	$416,000	$405,000	$646,196	$550,000

Now—MATCH THEIR BEST WITH YOUR MOST IN THE VICTORY LOAN!

Top off your good work on your Payroll Savings Plan with an outstanding showing in the Victory Loan—our last all-out effort!

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

WESTERN CONSTRUCTION NEWS

503 Market Street **San Francisco 5, California**

VICTORY LOAN

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

CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than $10,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information: County of job location (capital letters); name and address of contractor (bold face); bid price; brief description of work; awarding agency; and approximate date of award. More detailed information on many of these projects is often available, and will gladly be furnished upon your request to the Editor, WESTERN CONSTRUCTION NEWS, 503 Market Street, San Francisco.

CONTRACTS AWARDED

Large Western Projects . . .

Concrete Ship Constructors and **Case Construction Co.**, San Pedro, Calif., were awarded a contract in the amount of $1,943,000 to extend Piers Nos. 6 and 8, and other work at the Naval Repair Base in San Diego, Calif., by Bureau of Yards and Docks, Washington, D. C.

Healy & Harrelson, San Francisco, received a $769,000 contract for reserve fleet berthing facilities at Mare Island Navy Yard, by Bureau of Yards and Docks, Washington, D. C.

Morrison-Knudsen de Mexico, Mexico City, at 12,000,000 pesos ($2,400,000) will construct Sanalona dam 35 mi. from Culiacan, Mexico, for National Irrigation Commission, Mexico City.

Bechtel-McCone Corp., San Francisco, Calif., has a contract to erect a gasoline reduction plant at Burrel, Calif., to cost $2,500,000, for General Petroleum Corp., San Francisco.

Goetz & Brennan, Seattle, Wash.,were awarded a $440,320 contract to clear right-of-way for the Arlington-Bellingham-Blaine transmission line, about 71 mi. in length, by Bonneville Power Administration, Portland, Ore.

Stone & Webster Engineering Corp., San Francisco, Calif., at $2,500,000, has received a contract to erect a brick, concrete, and steel pilot plant and other buildings at San Jose, for International Minerals & Chemical Corp., San Jose.

Baruch Corp., Los Angeles, Calif., a contract for an estimated $1,000,000 for expansions to a tuberculosis sanitarium at Duarte, Calif., by Los Angeles Sanitarium.

Robert E. McKee, El Paso, Tex., holds a contract valued at $1,877,000 for additional buildings and facilities at Legion, Tex., for the Veterans' Administration, Washington, D. C.

Cater Electric Construction Co., Kansas City, Mo., was given a contract for $386,770 to build 482 mi. of electric line in Perkins Co., Kan., by Midwest Electric Membership Corp., Grant, Kan.

Fluor Corp., Los Angeles, Calif., holds a contract for erection of a complete asphalt plant at Willbridge, Ore., for California Asphalt Co., San Francisco, Calif.

Choluteca Honduras Development Co., Portland, Ore., will develop canneries, transportation facilities, hydroelectric projects and sawmills in Honduras, for the Republic of Honduras.

Steel Tank & Pipe Co., Portland, Ore., has a contract for $440,716 for a 36-in. water supply line in Portland, by City Council, Portland, Ore.

Fredrickson & Watson Construction Co., Oakland, Calif., were awarded a contract of $1,446,454 for a runway, taxiways, drainageways and lighting facilities at Moffett Field, Calif., by Bureau of Yards and Docks, Washington, D. C.

Koss Construction Co., Des Moines, Iowa, a contract for $565,895 to reconstruct a parking apron at the airport in Roswell, N. Mex., by U. S. Engineer Office, Albuquerque, N. Mex.

Haddock Engineers Ltd., Oceanside, Calif., $640,856 for steel siphons and other facilities on the San Diego aqueduct, by Bureau of Yards and Docks, Washington, D. C.

Highway and Street...

Arizona

GILA CO.—**Tanner Construction Co.,** Box 1832, Phoenix—$92,383 for highway project from Payson - Colcord Mountain to Natl. Forest—by Public Roads Administration, Phoenix. 11-27

MARICOPA CO.—**P. D. O. C.,** Luhrs Bldg., Phoenix — $198,373 for grading, draining and bitum. surf. treating of highway from Sells for 7.75 mi. northeasterly—by State Highway Dept., Phoenix. 11-21

California

CONTRA COSTA CO.—**Gunner Corp.,** 272 Annandale Rd., Pasadena — $195,431 for 2.3 mi. of grading and conc. paving between Concord Ave. and 0.4 mi. west of Ohmer Station—by Division of Highways, Sacramento. 11-19

LOS ANGELES CO.—**Ansco Construction Co.,** 2725 Atlantic Ave., Long Beach—$84,197 for paving on Dominguez St., 223d St. and Santa Fe Ave., near Long Beach—by County Board of Supervisors, Los Angeles. 11-15

LOS ANGELES CO.—**Ansco Construction Co., Inc.,** 2725 Atlantic Ave., Long Beach—$11,364 for paving 190 x 260 ft., including excav., fill and grading, etc., at Naval Operating Base, Terminal Island—by Bureau of Yards and Docks, Washington, D. C. 11-29

LOS ANGELES CO.—**Arthur A. Johnson,** 421 Pearl St., Laguna Beach—$25,798 for highway restoration at Palos Verdes—by U. S. Engineer Office, Los Angeles. 11-19

SACRAMENTO CO. — **A. Teichert & Son, Inc.,** 1846 37th St., Sacramento—$61,364 for improvements of ways, drives, avenues, and easements in Arden Park Vista, Sacramento—by Board of Supervisors, Sacramento. 11-8

SHASTA CO.—**A. A. Tieslau,** 1220 East Shore Blvd., Berkeley—$124,027 for reinf. conc. culvert and 0.8 mi. of grading and surf. at Seaman's Gulch near Ingot—by Division of Highways, Sacramento. 11-23

SOLANO CO.—**Parish Bros.,** Box 6, Benicia—$41,406 for surfacing road, old route 74, Benicia — by Division of Highways, Sacramento. 11-9

Idaho

BONNER AND BOUNDARY COS.—**D. A. Sullivan,** Parkwater, Wash.—$23,500 for crushed gravel and cover coat material in stockpiles on Highways No. 2, 95 and 195—by Bureau of Highways, Boise. 11-1

BONNEVILLE AND BINGHAM COS.—**Lobnitz Bros.,** 241 Sonna Bldg., Boise—$35,225 for crushed gravel stockpiles and cover coat material stockpiles on U. S. Highways No. 20 and 191 and S. R. No. 39—by Bureau of Highways, Boise. 11-1

BENEWAH CO.—**Nyberg Construction Co.,** Box 7, Yardley, Wash.—$57,935 for resurf. of 7 mi. of road between Saint Maries and Mission Point and furnishing crushed rock in stockpiles near U. S. Highway 95—by Bureau of Highways, Boise. 11-27

LATAH AND NEZ PERCE COS.—**Materne Bros.,** E. 227 Longfellow St., Spokane, Wash.—$22,500 for crushed rock and cover coat material in stockpiles on U. S. Highway No. 95—by Bureau of Highways, Boise. 11-1

LINCOLN, JEROME AND GOODING COS.—**Lobnitz Bros.**, 241 Sonna Bldg., Boise—$61,800 for crushed gravel and cover coat material in stockpiles on U. S. Highways No. 30, 93 and S. R. No. 22 and 25—by Bureau of Highways, Boise. 11-1

Montana

DEER LODGE CO.—**C. & F. Trucking & Contracting Co.**, Box 4, Butte—$183,354 for grading, widening bridge, surf. and road mix oiling and constr. of drainage structures on Section B of Deer Lodge-Butte Highway—by State Highway Commission, Helena. 11-30

GALLATIN AND PARK COS.—**S. Birch & Sons Construction Co.**, 314 Ford Bldg., Great Falls—$362,575 for grading, surf. with crushed rock and roadmix and constr. of drainage structures on the Bozeman Hill and Section C of the Rocky Canyon Rd.—by State Highway Commission, Helena. 11-30

Oregon

CLACKAMAS AND MARION COS.—**J. F. Johnson**, Newberg—$140,847 for 120-ft. steel bed arch span, conc. viaduct, and widening 0.3 mi. of highway on the Pudding River Bridge section of Pacific Highway, Ore.—by State Highway Commission, Salem. 11-7

CLATSOP CO.—**Heavy Hauling Co.**, Astoria—$151,200 for clearing 7.4 mi. of highway right-of-way on the Circle Bridge-Hug Point section of the Ore. Coast Highway—by State Highway Commission, Salem. 11-7

CLATSOP CO.—**J. R. Maginnis**, Portland—$119,500 for clearing 7.4 mi. of highway right-of-way, Circle Bridge-Hug Point section of Coast Highway—by State Highway Commission, Salem. 11-1

HARNEY CO.—**Sound Construction and Engineering Co.**, 1403 W. 45th St., Seattle, Wash.—$31,660 for 10,000 cu. yd. of crushed rock in stockpiles on Central Ore. and Lakeview-Burns Highways—by State Highway Commission, Salem. 11-1

HARNEY AND MALHEUR COS.—**Rogers Construction Co.**, Box 153, Tillamook—$235,479 for surfacing and oiling 18.8 mi.

of Buchanan-Malheur River section and $164,423 for 15.3 mi. of the Malheur River-Juntura section of the Central Oregon Highway—by State Highway Commission, Salem. 11-7

JEFFERSON CO.—**J. N. & M. J. Conley,** Portland—$226,310 for 10.4 mi. of macadam surf. on the Madras-Juniper Butte section of the Dalles-Calif. Highway—by State Highway Commission, Salem. 11-7

LAKE CO.—**M. C. Lininger & Sons,** Box 1386, Medford—$27,335 for 10,000 cu. yd. of crushed rock in stockpiles and 111 rods of woven wire stock fence on Lakeview-Burns Highway—by State Highway Commission, Salem. 11-1

LANE CO.—**Del R. Beebe Construction Co.,** Box 406, Reno—$41,975 for 11,500 cu. yd. of crushed rock or gravel in stockpiles on Siuslaw Highway—by State Highway Commission, Salem. 11-1

MULTNOMAH CO.—**Leonard & Slate of Oreg., Ltd.,** 7805 SW. 40th Ave., Portland—$149,705 for 2.5 mi. of grading on the Troutdale-Wahkeena Creek grading project on the Columbia River Highway—by State Highway Commission, Salem. 11-7

Texas

DALLAS CO.—**The Austin Road Co.,** Box 1590, Dallas—$194,882 for street and drainage work in Dallas—by City Council, Dallas. 11-26

DALLAS CO.—**The Austin Road Co.,** Box 1590, Dallas—$23,447 for street and drainage work on Madison Ave., Pembroke to Clarendon Dr., Dallas—by City Council, Dallas. 11-26

Utah

DAVIS CO.—**Reynolds Construction Co.,** Springville—$24,880 for 0.6 mi. of bitum. surf. at the north entrance of Clearfield Naval Supply Depot—by State Road Commission, Salt Lake City. 11-19

Bridge & Grade Separation...

Arizona

MOHAVE CO.—**H. L. Royden,** Box 3707, Phoenix—$59,548 for redecking Red Rock railroad bridge for highway use, at Topock—by State Highway Dept., Phoenix. 11-1

California

MODOC CO.—**Clifford A. Dunn,** Box 431, Klamath Falls, Ore.—$18,290 for four culverts between Cornell and Stronghold—by Division of Highways, Sacramento. 11-7

Montana

BEAVERHEAD CO.—**Cahill-Mooney Construction Co.,** Box 398, Butte—$49,926 for 139-ft. steel and conc. bridge over the Beaverhead River, also backfill and dike work 3.3 mi. southwest of Dillon—by State Highway Commission. 11-30

Oregon

MULTNOMAH CO.—**Archie R. Averill,** Portland—$32,467 for bridge and culvert on Troutdale-Wahkeena Creek section of the Columbia River Highway—by State Highway Commission, Salem. 11-7

Airport...

California

SANTA CLARA CO.—**Fredrickson & Watson Construction Co.,** 873 81st Ave., Oakland—$1,446,454 for runway, taxiways, drainageways and lighting facilities at Naval Air Station, Moffett Field—by Bureau of Yards and Docks, Washington, D. C. 11-23

New Mexico

CHAVES CO.—**Koss Construction Co.,** 205 Old Colony Bldg., Des Moines, Ia.—$565,895 for reconstruction of parking apron at the airport in Roswell—by U. S. Engineer Office, Albuquerque. 11-15

Water Supply . . .

California

SAN DIEGO CO.—**American Pipe & Construction Co.,** Box 3428 Terminal Annex, Los Angeles—$221,894 for supplying and installing 9,780 lin. ft. of 36-in. pipe, valves, fittings and appurtenances for the Balboa Park watermain, San Diego—by City Council, San Diego. 11-6

SAN DIEGO CO.—**Haddock Engineers, Ltd.,** Box 479, Oceanside—$640,856 for steel siphons and facilities in connection with San Diego aqueduct—by Bureau of Yards and Docks, Washington, D. C. 11-19

Montana

CHOUTEAU CO.—**M. F. Kiely & Son.,** Box 65, Butte—$25,460 for constr. and install. of 400,000-gal. steel water storage tank and water main in Fort Benton—by City Council, Fort Benton. 11-21

Nevada

LINCOLN CO.—**Cox & Torkelson,** Medford, Ore.—$31,804 for water facilities at Panaca—by Farm Security Administration, Ely. 11-21

Oregon

CLACKAMAS CO.—**Rushlight Co.,** 55 NE. Faragut St., Portland—$17,772 for extensions to water system of Oak Lodge Water District, Oak Grove—by Oak Lodge Water District, Oak Grove. 11-26

MULTNOMAH CO.—**Steel Tank & Pipe Co.,** Portland—$440,716 for laying a 36-in. water supply line from Mount Tabor to Washington Park reservoirs—by City Council, Portland. 10-30

Texas

BROWN CO.—**B. & M. Construction Co.,** 310 Petroleum Bldg., Oklahoma City, Okla.—$29,189 for pumping supply line, station and a water supply line in Bangs—by City Council, Bangs. 11-1

SAN SABA CO.—**B. & M. Construction Co.,** 310 Petroleum Bldg., Oklahoma City, Okla.—$14,861 for pump station, surface reservoir and equipment in San Saba—by City Council, San Saba. 11-1

Washington

KING CO.—**Argentieri & Colarossi,** 1819 Weller St., Seattle—$3,558 for 8-in. cast iron watermains on 26th Ave., S.—by Board of Public Works, Seattle. 11-26

KING CO.—**T. N. Buchanan Co.,** Seattle—$11,899 for conc. foundation for tank and tower on W. Myrtle St., Seattle—by Board of Public Works, Seattle. 11-26

KING CO.—**Valley Construction Co.,** 7708 Rainier Ave., Seattle—$5,814 for 8-in. cast iron watermains on 46th Ave., S.—by Board of Public Works, Seattle. 11-26

KITSAP CO.—**Argentieri & Colarossi,** 1819 Weller St., Seattle—$48,937 for water system, storage tank and pump station in Tracyton—by Tracyton Water District, Tracyton. 11-13

Sewerage . . .

California

CONTRA COSTA CO.—**H. J. Ashley,** R.F.D. Box 1073, Main St., Walnut Creek—$9,466 for improvements to sewage disposal utilities in Concord—by Federal Public Housing Authority, San Francisco. 11-8

LOS ANGELES CO.—**Martin Construction Co., Inc.,** 721 S. Ford Blvd., Los Angeles—$4,799 for sanitary sewers in section of the Los Angeles Airport—by Board of Public Works, Los Angeles. 11-6

LOS ANGELES CO.—**Midland Construction Co.,** 8677 Otis St., South Gate—$4,019 for sanitary sewers in Moore St. between Marco Place and Victoria Ave., Los Angeles—by Board of Public Works, Los Angeles. 11-6

LOS ANGELES CO.—**Robert Vlacich,** 2314 Carlyle Pl., Los Angeles—$3,542 for sanitary sewers in Crisp Canyon Rd. between Lacota Pl. and Round Valley Dr., Los Angeles—by Board of Public Works, Los Angeles. 11-6

LOS ANGELES CO.—**Paul Vukich Construction Co.,** 112 W.

FACTORY AND GENERAL OFFICES
LOS ANGELES, CALIF. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

9th St., Los Angeles—$18,911 for sanitary sewer in District No. 21-F in Long Beach—by City Council, Long Beach. 11-21

LOS ANGELES CO.—**R. A. Wattson Co.,** 5628 Vineland Ave., North Hollywood—$25,192 for sanitary sewer and appurtenances on Ithaca Ave. and Belleglade Ave., Los Angeles—by Board of Public Works, Los Angeles. 11-28

MONTEREY CO.—**John Pestana,** 990 73rd Ave., Oakland—$13,855 for sanitary sewers on Sunstream & Westfield St., Salinas—by Alisal Sanitary District, Salinas. 11-7

SAN DIEGO CO.—**Artukovich Bros.,** 7320 Atlantic Ave., Hynes—$84,300 for portion of Trunk Sewer No. 4 from Capistrano Place in Mission Beach to Famosa Blvd., San Diego—by City Council, San Diego. 11-15

SOLANO CO.—**Stolte, Inc.,** 8451 San Leandro Blvd., Oakland—$10,257 for drainage pumping station at Vallejo—by Federal Public Housing Authority, San Francisco. 11-27

Colorado

DENVER CO.—**Steinwald & Watts Construction Co.,** 600 S. Forest St., Route 2, Denver—$5,271 for secondary treatment tank at Eastside Sewage Plant, E. 40th and Wabash St., Denver—by City Council, Denver. 11-6

Oregon

MULTNOMAH CO.—**Leonard & Slate of Oreg., Ltd.,** 7805 SW. 40th Ave., Portland—$33,452 for main and lateral sewers along Columbus St. and for lateral sewers in other residential districts in Portland—by City Council, Albany.

Texas

DALLAS CO.—**E. L. Dalton & Co.,** Great Natl. Life Bldg., Dallas—$46,710 for sanitary sewers and watermains in Dallas—by City Council, Dallas. 11-26

DALLAS CO.—**E. H. Reeder Construction Co.,** 4013 Glendora, Dallas—$35,037 for storm sewer improvements on Beacon, Lindell and Hubert Sts., Dallas—by City Council, Dallas. 11-5

DALLAS CO.—**E. H. Reeder Construction Co.,** 4013 Glendora, Dallas—$258,207 for sanitary sewers and watermains in Dallas—by City Council, Dallas. 11-1

DALLAS CO.—**E. H. Reeder Construction Co.,** 4013 Glendora, Dallas—$10,633 for storm sewer improvements on Rawlins St., Dallas—by City Council, Dallas. 11-1

DALLAS CO.—**Ben Sira & Co.,** 3901 Elm St., Dallas—for storm sewer improvements on Lemmon Ave., St. Louis and SW. Ry. underpass to Westside Dr., Dallas—by City Council, Dallas. 11-26

DALLAS CO.—**Ben Sira & Co.,** 3901 Elm St., Dallas—$19,666 for storm sewers on Eastern Ave., Highland Park—by Town Council, Highland Park. 11-23

HIDALGO CO.—**Fitzgerald, Newton & Carey,** Brownwood—$58,295 for waterworks and sewerage extensions in Mission—by City Council, Mission. 11-1

Washington

KING CO.—**Superior Construction Co.,** 3281 36th SW., Seattle—$3,157 for 645 one-foot., 8-in. pipe sewers in 34th Ave., N., Seattle—by Board of Public Works, Seattle. 11-26

Waterway . . .

California

SACRAMENTO CO.—**H. Earl Parker,** 12th and F Sts., Marysville—$51,948 for levee enlargement on Sacramento River and slough levee of Sycamore Slough—by U. S. Engineer Office, Sacramento. 11-19

SAN DIEGO CO.—**Case-American Dredging Co.,** Box 6, San Pedro—$475,000 (est.) for dredging in connection with reserve fleet berthing at the U. S. Naval Repair Base, San Diego—by Bureau of Yards and Docks, Washington, D. C. 11-14

SAN DIEGO CO.—**Concrete Ship Constructors,** Box D, National City and **Case Construction Co.,** Box 6, San Pedro—$1,943,000 for extension to Pier No. 6 and No. 8 and including creosoted timber pile mooring dolphins at the U. S. Naval Repair Base, San Diego—by Bureau of Yards and Docks, Washington, D. C. 11-15

SAN FRANCISCO CO.—**Clinton Construction Co.,** 923 Folsom St., San Francisco—$8,640 for wharf repair between Piers 9 and 15 on the waterfront, San Francisco—by Board of State Harbor Commissioners, San Francisco. 11-9

SAN FRANCISCO CO.—**Ocean Construction Co.,** 135 Stockton St., San Francisco—$18,313 for removing wharf and shed structures, also piles on Mission Rock, end of Pier No. 50, San Francisco — by Board of State Harbor Commissioners, San Francisco. 11-21

SAN MATEO CO.—**Union Paving Co.,** 212 Babcock Bldg., San Francisco—$29,332 for drainage and dike work at Bay Meadows Airport, San Mateo—by Calif. Jockey Club, San Mateo. 11-2

SOLANO CO.—**Case Construction Co.,** Box 6, San Pedro—$61,806 for new piling for Berths 32, 33, 34E, 34W and 35 at the Naval Ammunition Depot, Mare Island—by Bureau of Yards and Docks, Washington, D. C. 11-16

SOLANO CO.—**Healy & Harrelson,** 690 Market St., San Francisco—$769,000 for reserve fleet berthing facilities at Mare Island Navy Yard—by Bureau of Yards and Docks, Washington, D. C.

SOLANO CO.—**San Francisco Bridge Co.,** 503 Market St., San Francisco—$98,750 for dredging at the Mare Island Strait—by Bureau of Yards and Docks, Washington, D. C. 11-16

Idaho

BANNOCK CO.—**A. D. Stanley,** Box 1605, Boise—$32,000 for hatchery, rearing ponds, garage and residence on Whisky Creek near Grace—by Idaho State Fish and Game Commission, Boise. 11-19

Oregon

POLK CO.—**Oscar Butler & Son,** 4900 NE. 42nd St., Portland—$23,111 for reconstructing revetment and drift barrier at Independence Bend in the Willamette River—by U. S. Engineer Office, Portland. 11-2

Texas

CAMERON CO.—**Atlantic Gulf & Pacific Dredging Co.,** Houston—$578,850 for dredging Intracoastal waterway from Port Isabel to Three Islands—by District Engineer, Galveston. 11-23

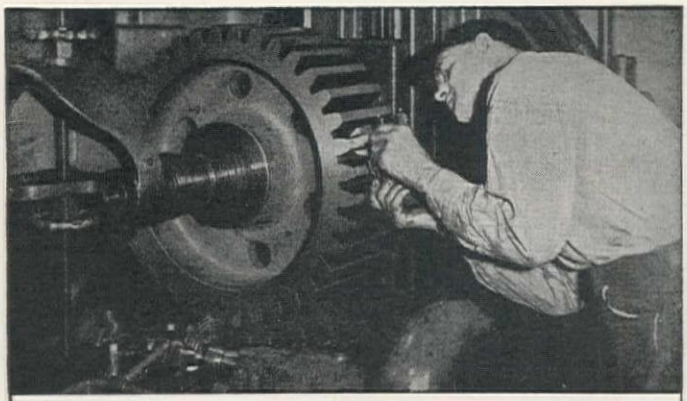
ELLIS CO.—**R. Lee Halford,** Rockwell—$26,475 for levee repairs in Ellis Co., Trinity River Basin—by District Engineer, Galveston. 11-13

NUECES AND KLEBERG COS.—**Sternberg Dredging Co.,** 1706 Arcade Bldg., St. Louis, Mo.—$594,405 for dredging Intracoastal waterway between Corpus Christi Bay and North Bird Island—by District Engineer, Galveston. 11-20

Dam . . .

Mexico

SINALOA—**Morrison-Knudsen de Mexico,** Avenue Juarez 76, Mexico, D. F.—(est.) 12,000,000 pesos (about $2,400,000) for excavation and fill only for 2,500-ft. long Sanalona dam, across Rio Culiacan, 35 mi. from Culiacan and northeast of Mazatlan—by Natl. Irrig. Comm. of Mexico. 11-28



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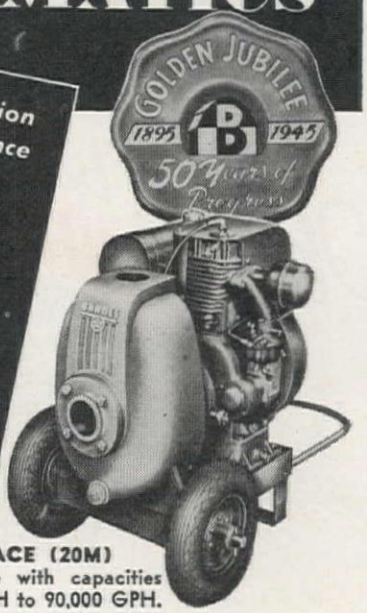

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BARNES MANUFACTURING CO.

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Irrigation . . .

Arizona

YUMA CO.—**Macco Construction Co.,** 811 Paramount Blvd., Clearwater, Calif.—$146,860 for gunite lining of laterals of the irrigation system of the Gila Reclamation Project, near Yuma—by Bureau of Reclamation, Washington, D. C. 11-14

California

RIVERSIDE CO.—**Fisher Construction Co.,** Box 4035, Phoenix, Ariz.—$320,903 for wasteway on Coachella Canal—by Bureau of Reclamation, Washington, D. C. 11-2

Nebraska

SHERIDAN CO.—**Trione Contracting Co.,** Denver, Colo.—$81,362 for constr. work on the irrig. system of the Mirage Flats Project near Hay Springs—by Bureau of Reclamation, Washington, D. C. 11-30

Building . . .

Arizona

MARICOPA CO.—**J. R. Womack,** 3612 N. 7th St., Box 1190, Phoenix—$200,000 (est.) for thirty 2- and 3-bedroom housing units between 3rd and 7th Sts., Osborne Rd. and Whitton Ave., Phoenix—by Self. 11-2

NAVAJO CO.—**King-Hoover Construction Co.,** Route 9, Box 457-B, 3003 E. Washington St., Phoenix—$60,000 for two-story brick and conc. block auto supply building at 2nd and Warren Sts., Winslow—by Winslow Auto Supply Co., Winslow. 11-1

PIMA CO.—**A. C. LaRue Construction Co.,** 1319 N. 12th Ave., Box 710, Tucson—$300,000 (est.) for addition to hospital bldg. covering 50 x 360 ft. and containing 71 beds, chapel, pharmacy, soda fountain, laboratories and operating rooms, in Tucson—by Tucson Medical Center, Tucson. 11-2

California

ALAMEDA CO.—**The Austin Co.,** 618 Grand Ave., Oakland—$400,000 for reinf. conc. addition to factory bldg. at 810 Carlton St., Berkeley—by Colgate-Palmolive-Peet Co., Berkeley. 11-23

ALAMEDA CO.—**Empire Construction Co., Ltd.,** 344 Harriet St., San Francisco—$68,475 for mezzanine floor to building in Oakland—by Fruitvale Canning Co., Oakland. 11-14

ALAMEDA CO.—**Elmer J. Freethy,** 1432 Kearney St., El Cerrito—$85,706 for restaurant bldg. on MacArthur Blvd., Oakland—by Andrew Williams Stores, Inc., Oakland. 11-26

ALAMEDA CO.—**E. J. Freethy,** 1432 Kearney St., El Cerrito—$139,000 for one-story addition to two-story telephone exchange bldg. at 2112 Fruitvale Ave., Oakland—by Pacific Telephone and Telegraph Co., San Francisco.

ALAMEDA CO.—**Rademann-Guisto,** 40 Ringold St., San Francisco—$66,750 for conversion of Quartermaster Subdepot, Oakland—by U. S. Engineer Office, San Francisco. 11-15

ALAMEDA CO.—**Swinerton & Walberg,** 225 Bush St., San Francisco — for reinf. conc., 230 x 540 ft. can factory bldg. at 156th Ave., San Leandro—by Pacific Can Co., San Francisco. 11-2

CONTRA COSTA CO. — **Joseph Siino,** 102 School St., Pittsburg—$140,000 for stadium-type reinf. conc. theater bldg. seating 1,150 people, at Railroad and Central, Pittsburg—by self. 11-30

FRESNO CO. — **Bechtel-McCone Corp.,** 601 W. 5th St., Los Angeles—$2,500,000 for a 30,000,000 cu. ft. gasoline reduction plant at Burrel—by General Petroleum Corp., San Francisco. 11-8

FRESNO CO.—**Larson & Ratto Co.,** 1901 Hedges St., Fresno—$41,000 (est.) for addition to warehouse at 2720 Ventura St., Fresno — by Madera Wine Distributing Co., Fresno. 11-16

INYO CO.—**James A. Schlapp,** 5612 Corona St., Maywood—$50,000 for reinf. brick garage bldg. in Bishop—by Howard Ellis, Bishop. 11-23

KERN CO.—**Carter & Fowler,** 400 11th St., Bakersfield—$225,000 for meat packing plant at Bakersfield—by Piute Packing Co., Bakersfield. 11-8

KERN CO.—**Guy Hall,** Box 1723, Bakersfield—$59,000 for warehouse at 800 14th St., Bakersfield—by Kern Realty, Inc., Bakersfield. 11-19

LOS ANGELES CO.—**Aetna Construction Co.,** 5423 Flemish Village Lane, Los Angeles—$230,000 for reinf. brick laundry bldg. at 1201 Rio Vista St., Los Angeles—by City Linen Supply Co., Los Angeles. 11-16

LOS ANGELES CO.—**Alco Construction Co.,** 5423 Flemish Village Lane, Los Angeles—for steel frame, corrugated iron sides and roof and cement floor factory bldg., on Medford Ave., Los Angeles—by Utility Trailer Corp., Los Angeles. 11-16

LOS ANGELES CO. — **Allied Contractors, Inc.,** 9700 W. Pico Blvd., Los Angeles —$240,000 for 20 homes each having 3 bedrooms and 2 baths, at Pico Blvd. and Beverly Dr., Beverly Hills—by selves. 11-23

LOS ANGELES CO.—**Allied Contractors, Inc.,** 9700 W. Pico Blvd., Los Angeles—$600,000 for 61 frame and stucco housing units and 16 four-family frame and stucco units on Victory Blvd. and Kester Ave., Van Nuys—for selves. 11-23

LOS ANGELES CO.—**Arrow Construction Co.,** 4150 W. Washington Blvd., Los Angeles—$117,000 for one-story, stucco and wood frame furniture factory bldg. at 5901 W. Jefferson Blvd., Los Angeles—by Bert Knaster Furniture Mfg. Co., Los Angeles. 11-27

LOS ANGELES CO.—**Guy F. Atkinson Co.,** 1103 Heartwell Bldg., Long Beach—$230,850 for main bldg. substructure, foundations for steam generator and turbine, also piping and drainage, at Harbor Steam Plant, Island Ave. and B St., Wilmington —by Water and Power Dept., Los Angeles.

LOS ANGELES CO.—**James I. Barnes Construction Co.,** 1119 Montana Ave., Santa Monica—$502,600 for 4 two-story wood frame air terminal bldgs. at NE. portion of Los Angeles Airport—by Los Angeles Board of Public Works, Los Angeles. 11-16

LOS ANGELES CO.—**Baruch Corp.,** 625 S. Olive St., Los Angeles—$1,000,000 (est.) for expansions to tuberculosis hospital at

Duarte—by Los Angeles Sanatorium, Los Angeles. 11-9

LOS ANGELES CO.—**S. N. Benjamin,** 728 E. 16th St., Los Angeles—$60,000 for reinf. brick factory bldg. at 734 E. 16th St., Los Angeles—by I. Fleming, Los Angeles. 11-9

LOS ANGELES CO.—**Sol S. Bergman,** 1646 Wooster St., Los Angeles—$172,500 for fifty 6-room, frame and stucco housing units on Chase Ave. in the Venice District—by Santana Corp., Los Angeles. 11-9

LOS ANGELES CO.—**Sol S. Bergman,** 1646 Wooster St., Los Angeles—$46,550 for eight 5-room, frame and stucco houses on Alla Rd. and Beethoven St., Venice—by David L. Sefman, Los Angeles. 11-16

LOS ANGELES CO.—**R. J. Blanco,** 5170 Overland Ave., Culver City—$43,540 for seven 5-room, frame and stucco homes in West Los Angeles—by self. 11-23

LOS ANGELES CO.—**Buttress & McClellan,** 1013 E. 8th St., Los Angeles—$80,000 for steel frame, corrugated iron sides and roof and cement floor shop bldg. at Santa Fe Springs—by S. R. Bowen, Santa Fe Springs. 11-9

LOS ANGELES CO.—**Noel M. Calhoun,** 845 N. Highland Ave., Los Angeles—$45,000 for one-story and part mezzanine, reinf. conc. frame with brick filler walls, store bldg. at 1081-89 Broxton Ave., Los Angeles—by J. J. Jakosky, Los Angeles. 11-2

LOS ANGELES CO.—**Calif. Orange Bldg. Co.,** 631 S. Witmer St., Los Angeles—$2,000,000 for 300 3-bedroom homes of frame and stucco constr. near Atlantic Ave. and Artesia Blvd., Long Beach—by self. 11-16

LOS ANGELES CO.—**R. E. Campbell,** 316 E. Weber Ave., Compton—$400,000 for addition to Lafayette Hotel on Broadway and Linden Ave., Long Beach—by self. 11-6

LOS ANGELES CO.—**Continental Construction Co.,** 112 S. La Brea Ave., Los Angeles—$40,000 for 20-unit motel at 928 W. Olive Ave., Burbank—by self. 11-2

LOS ANGELES CO.—**R. J. Daum,** 6803 West Blvd., Inglewood, and **J. V. Lopez Co.,** 318 E. Third St., Los Angeles (joint venture)—for factory bldg. at 2570 Tweedy Blvd., South Gate—by Brown-Saltman Furniture Co., Los Angeles. 11-16

LOS ANGELES CO.—**R. J. Daum,** 6803 West Blvd., Inglewood—$97,000 for a new office building at 739 S. Grand Ave., San Pedro—by the Southern Counties Gas Co., Los Angeles. 11-8

LOS ANGELES CO.—**L. E. Dixon Co.,** 609 S. Grand Ave., Los Angeles—$300,000 for reinf. conc. 10-story addition to a building at 74757 S. Santee St., Los Angeles—by Cooper Bldg., Inc., Los Angeles. 11-13

LOS ANGELES CO.—**Eastern Builders Co.,** 636 E. Compton Blvd., Compton—$40,000 for 5-room store bldg. and four 3-room apartments on Compton Blvd., Compton—by self. 11-2

LOS ANGELES CO.—**Wm. B. Erickson,** 2447 Palomona St., Pasadena—$50,000 for conversion of old church auditorium into classrooms and building of new auditorium at 539 N. Lake St., Pasadena—by Evangelical Mission Covenant Church, Pasadena. 11-2

LOS ANGELES CO.—**M. Feigenbaum,** 143 M. Formosa Ave., Los Angeles—$40,000 for one-story, brick store bldg. at 2700 N. Broadway, Los Angeles—by F. May Co., Los Angeles. 11-2

LOS ANGELES CO.—**Sam Fink,** 443 S. La Cienega Blvd., Los Angeles—$75,000 for two-story office bldg. at 435 S. La Cienega Blvd., Los Angeles—by Gershenson, Los Angeles. 11-21

LOS ANGELES CO.—**Glendale Housing & Display Co.,** 6702 Lankershim Blvd., North Hollywood—$64,800 for twelve 5-room, frame and stucco housing units on Peoria St., Rialto St., Redbank and Neenach Sts., Van Nuys District—by self. 11-9

LOS ANGELES CO.—**C. L. Hess,** 938 W. Washington Blvd., Los Angeles—$60,000 for conversion of office bldg. to ticket office at 529 W. 6th St., Los Angeles—by Matson Navigation Co., Los Angeles. 11-9

LOS ANGELES CO.—**Robert V. Hine,** 122 S. Maple Dr., Beverly Hills—$40,000 for 2-story, 17-room office bldg. at 120 South Lasky Dr., Beverly Hills—by self. 11-2

LOS ANGELES CO.—**H. M. Hodges,** 4816 W. Pico Blvd., Los Angeles—on a guaranteed cost plus a fixed-fee basis for a one and part 2-story nose hangar and administration bldg. at the Los Angeles Municipal Airport—by American Airlines, Inc., Los Angeles. 11-9

LOS ANGELES CO.—**Harry Kambourian,** 946 S. New Hampshire Ave., Los Angeles—$45,000 for three 3-family, frame and stucco, 12-room apartment bldgs. on Dockens St., Van Nuys District—for self. 11-9

LOS ANGELES CO.—**W. E. Kier Construction Co.,** 1462 N. Stanley Ave., Los Angeles—$41,000 for alterations to first floor of west wing of Standard Oil Bldg.,

Los Angeles—by Standard Oil Co. of Calif., Los Angeles. 11-9

LOS ANGELES CO.—**H. H. Larsen Co.,** 125 S. Santa Fe Ave., Los Angeles—$55,000 for reinf. conc. garage building at 1462 E. Sixth St., Los Angeles—by J. A. Clark Draying Co., Los Angeles. 11-6

LOS ANGELES CO.—**Lynch Construction Co.,** 730 E. Gage Ave., Los Angeles—$40,000 for reinf. brick factory bldg. at 711 E. Jefferson Blvd., Los Angeles — by J. Doumak, Los Angeles. 11-23

LOS ANGELES CO.—**Joshua H. Marks Co.,** 908 Architect Bldg., Los Angeles—for 3-story, reinf. conc. store bldg. of 200,000 sq. ft. at Crenshaw and Santa Barbara Blvds., Los Angeles — by May Co., Los Angeles. 11-29

LOS ANGELES CO.—**Ellis G. Martin,** 1331 5th St., Santa Monica — $52,000 for garage bldg. at 9031 Olympic Blvd., Beverly Hills—by Hillcrest Motors, Beverly Hills. 11-16

LOS ANGELES CO.—**Paul F. McKenzie,** 254 Bennett Ave., Long Beach—$80,000 for six 8-unit, 24-room apartment bldgs. in Long Beach—by self. 11-2

LOS ANGELES CO. — **Meyer - Nash Corp.,** 1414 Hollywood Way, Burbank—for 187 dwellings at Manchester and Sepulveda Blvd., Westchester District — by selves. 11-9

LOS ANGELES CO.—**Myers Bros.,** 3407 San Fernando Rd., Los Angeles—$60,000 for structural steel and sheet metal, 60x350 ft. open-sided warehouse bldg. at 10510 S. Alameda St., Los Angeles—by Earle M. Jorgenson Co., Los Angeles. 11-29

LOS ANGELES CO.—**Myers Bros.,** 3407 San Fernando Rd., Los Angeles—$125,000 for one and part two-story reinf. conc. office bldg. at 10510 S. Alameda St., Los Angeles—by Earle M. Jorgensen Co., Los Angeles. 11-27

LOS ANGELES CO.—**Myers Bros.,** 3407 San Fernando Rd., Los Angeles—$50,000 for printing plant bldg. at 4837 Huntington Dr., Los Angeles—by Dillingham Printing Co., Inc., Los Angeles. 11-23

LOS ANGELES CO.—**J. O. Narey,** 203 E. 76th St., Los Angeles—$42,000 for two 4-family, 20-room, frame and stucco apartment bldgs. in Los Angeles—by Nancy I. Fisk, Los Angeles. 11-2

LOS ANGELES CO.—**William P. Neil Co.,** 4814 Loma Vista Ave., Los Angeles—$70,000 for reinf. conc. warehouse at 754 S. Alameda St., Los Angeles—by Smart & Final Co., Los Angeles. 11-29

LOS ANGELES CO.—**J. O. Oltmans,** 810 E. 18th St., Los Angeles—for a church bldg. containing an auditorium, assembly room and kitchen at the corner of Sepulveda Blvd., and Elderwood St., W. Los Angeles—by Village Church of Westwood. 11-16

LOS ANGELES CO.—**R. H. Poole,** 5338 Alhambra Ave., Los Angeles—$45,950 for new medical bldg. of reinf. conc. and brick in Huntington Park—by Dr. Morton I. Cole, Los Angeles. 11-2

LOS ANGELES CO. — **E. A. Ralston,** 6669 Sunset Blvd., Hollywood — for new factory bldg. on 10-ac. site on Valley Blvd., El Monte—by Electric Household Corp., Los Angeles. 11-9

LOS ANGELES CO. — **Wm. Simpson Construction Co.,** 816 W. 5th St., Los Angeles—for 240 x 360-ft. steel frame with masonry walls motor parts bldg. in Van Nuys District—by General Motors Corp., Chevrolet Division, Los Angeles. 11-16

LOS ANGELES CO. — **Wm. Simpson Construction Co.,** 816 W. 5th St., Los Angeles — $1,200,000 for a reinf. conc. and brick warehouse and office building to be located at 49th St. and Santa Fe Ave., Vernon—by Brunswig Drug Co., Los Angeles. 11-13

LOS ANGELES CO.—**Jerry Stehlik,** 3843 Olmsted Ave., Los Angeles—$58,180 for two 6-family, 24-room, frame and stucco apartment bldgs. on Morrison St., Van Nuys District—by self. 11-2

LOS ANGELES CO. — **Stronach Construction Co., Inc.,** 115 N. Robertson Blvd., Los Angeles—$75,000 for two-story conc. and brick store building at 354 S. Western Ave., Los Angeles—by Lerner Shops, Los Angeles. 11-1

LOS ANGELES CO.—**Swinerton & Walberg Co.,** 605 W. Olympic Blvd., Los Angeles—$1,000,000 (est.) for additions to a factory at 4815 Santa Fe Ave., Los Angeles —by American Can Co., Los Angeles. 11-20

LOS ANGELES CO.—**Theisen Co.,** 525 Stonehurst Dr., Altadena—$51,800 for remodeling building at 233 Market St., Los Angeles—by Los Angeles County Board of Supervisors, Los Angeles. 11-13

LOS ANGELES CO.—**United Bldg. Co.,** 6116 Wilshire Blvd., Los Angeles—for 110 6-room houses at Centinela Blvd. and Appleton St., Venice District—by selves. 11-16

LOS ANGELES CO.—**P. J. Walker Co.,** 3900 Whiteside Ave., Los Angeles—$285,000 for adding a third story over part of the Times building at 202 W. 1st St., Los Angeles—by Southwest Co., Los Angeles. 11-1

LOS ANGELES CO. — **Ivan M. Wells Construction Co.,** 509 S. Beverly Dr., Beverly Hills—$41,692 for four 6-room, frame and stucco houses in West Los Angeles, by self. 11-16

MONTEREY CO.—**Associated Refrigerating Engineers,** 2100 E. Vernon Ave., Los Angeles—$1,000,000 for 500-ton daily capacity ice plant on 41-acre site at Salinas—by Shippers' Development Co., Salinas. 11-19

NAPA CO.—**Moore & Roberts,** 693 Mission St., San Francisco—$364,200 for one-story and partial basement reinf. conc. mess hall at Veterans' Home, Yountville—by Calif. Division of Architecture, Sacramento. 11-30

ORANGE CO.—**Jules W. Markel,** 2128 Greenleaf St., Santa Ana—$43,000 for 1-story, masonry and acoustical tile telephone bldg. at 18th St. and Orange Ave., Costa Mesa, Newport Beach—by Southern Calif. Telephone Co., Los Angeles. 11-2

RIVERSIDE CO.—**La Sierra College,** La Sierra Heights, Riverside—$120,000 for a two-story conc. and wood frame library and administration building on the La Sierra campus—by self. 11-6

SACRAMENTO CO.—**J. T. Butts,** 1312 Del Paso Blvd., North Sacramento—$88,025 for 24 apartment units, also 28 private garages at Los Robles Motor Lodge, Auburn Blvd., Highways 40 and 99—by Roy F., Mabel, Lloyd B. and Ann P. Brown, Sacramento. 11-20

SACRAMENTO CO. — **Lawrence Construction Co.,** 3030 V St., Sacramento—$116,300 for conc., wood and structural steel warehouse in Sacramento—by Slakey Bros., Sacramento. 11-29

SAN DIEGO CO.—**Trepte Construction Co.,** 2001 Kettner Blvd., San Diego—$40,-

000 for retail store bldg., at 935 Union St., San Diego—by Firestone Stores, San Diego. 11-23

SAN FRANCISCO CO.—**Central California Construction Co.,** 230 California St., San Francisco — $42,000 for a one-story stucco and frame storage and salesroom bldg. at 15th and Mission St., San Francisco —by Kamper & Barrett, Inc., San Francisco. 11-14

SAN JOAQUIN CO. — **Shaul Construction Co.,** 19482 Lake Chabot Rd., Hayward —$51,000 for addition and alterations to bldg. in Stockton—by Center Poultry Co., Stockton. 11-30

SAN MATEO CO.—**Hardiman Construction Co.,** 37 Drake Ave., Burlingame—$300,000 for the first 54 homes on a 507-home subdivision development at Lomita Park—by John L. Hardiman, Burlingame. 11-20

SAN MATEO CO.—**H. H. Larsen Co.,** 64 South Park, San Francisco — $59,632 for transmitting station bldg. at Belmont—by Press Wireless, Inc., Los Angeles. 11-28

SAN MATEO CO.—**C. F. Parker,** 1644 Monterey Blvd., San Francisco—$63,190 for reinf. conc. elementary school on Woodside Rd. and Murray Court, Redwood City—by Elementary School District, Redwood City. 11-29

SAN MATEO—**Harry A. Thomsen, Jr.,** 315 Montgomery St., San Francisco — for new main office bldg. in Redwood City —by Pacific Telephone & Telegraph Co., San Francisco. 11-30

SAN MATEO CO.—**G. W. Williams Co.,** 10 California Dr., Burlingame—$50,000 for one-story bldg. which will house 6 stores at Broadway and Chula Vista Ave., Burlingame—by A. R. Hahn, Burlingame. 11-19

SAN MATEO CO.—**G. W. Williams Co.,** 10 California Dr., Burlingame — $150,000 for a reinf. conc. mortuary on Calif. Park Rd. and Peninsula Ave., Burlingame—by Crosby-N. Gray & Co., Burlingame. 11-6

SANTA BARBARA CO.—**Andrew McDonough,** 523½ Anacapa St., Santa Barbara—$100,000 (est.) for garage, service and sales bldg. on Chapala St., Santa Barbara—by George Young, Santa Barbara. 11-21

SANTA CLARA CO.—**Lew Jones Construction Co.,** San Jose—$100,000 for one-story reinf. conc. addition to industrial bldg. at 955 Newhall St., San Jose—by Clapp Foods, Inc., San Jose. 11-28

SANTA CLARA CO. — **M. L. Marvin,** 7600 Avalon Blvd., Los Angeles—$100,000 for addition and remodeling of a printing plant in Mountain View—by Pacific Press Publishing Co., Mountain View. 11-15

SANTA CLARA CO.—**Stone & Webster Engr. Corp.,** 235 Montgomery St., San Francisco—$2,500,000 for brick, conc. and steel pilot plant, warehouses, boiler house, garage, etc., on Monterey Rd., near San Jose—by International Minerals and Chemical Corp., San Jose. 11-23

STANISLAUS CO.—**Monson Bros.,** 475 Sixth St., San Francisco—$201,000 for one-story reinf. conc. milk processing plant in Hughson — by Dairy Maid Creameries, Ltd., Hughson. 11-16

Idaho

ADA CO.—**Jordan & Son,** Boise—$280,542 for four-story reinf. conc. and brick, streamlined bldg. in Boise—by Salt Lake Hardware Co., Salt Lake City, Utah. 11-19

BANNOCK CO. — **Brennan & Cahoon**

Construction Co., Box 1742, Boise—$60,579 for reinf. brick and conc. shop and garage bldg. in the 1300 block South, First Ave., Boise — by County Commissioners, Bannock County, Pocatello. 11-15

BANNOCK CO.—**Herb Poynter**, 218 N. 10th Ave., Pocatello—$61,329 for a shop building in Pocatello—by Bannock County Commissioners, Pocatello. 11-10

CANYON CO.—**J. R. Simplot Dehydrating Corp.**, Caldwell—$300,000 for cold storage plant, which will house 10,000 tons of ice and manufacture 60 tons per day, in Caldwell—by self. 11-21

Montana

SANDERS CO.—**Corwin and Co.**, Great Falls—$100,000 for courthouse in Thompson Falls — by Sanders County Commissioners. 11-12

Nevada

CLARK CO.—**Pioneer Construction Co.**, Box 2111, Las Vegas—for 40-room addition to a hotel bldg. in Las Vegas—by Last Frontier Hotel, Las Vegas. 11-21

WASHOE CO.—**Chester Patterson**, Reno—$100,000 for 60,000 sq. ft. prefabricated steel warehouse building at Reno—by E. S. Bender & Associates, Reno. 11-8

Oregon

MARION CO.—**The Halvorson Construction Co.**, 608 1st Natl. Bank Bldg., Salem—$75,000 for 20-cabin tourist auto court on highway 99 near North Salem. 11-26

UMATILLA CO. — **A. Ritchie & Son**, Walla Walla, Wash.—$200,000 for pea cannery bldg. near Pendleton — by Eastern Oregon Cannery Co., Pendleton. 11-12

Texas

BEXAR CO.—**J. C. Worcester**, 1634 W. Craig Place, San Antonio—$96,816 for warehouse on north side of Dawson St., San Antonio—by Southwestern Specialty Co., San Antonio. 11-14

COMAL CO.—**Leslie Crockett Construction Co.**, 112 Academy Dr., Austin—$92,000 to $100,000 for new weave room for textile mill in New Braunfels—by New Braunfels Textile Mill. 11-20

DALLAS CO. — **Inge Construction Co.**, 2326 N. Beckley, Dallas—$1,000,000 (est.) for new factory and office bldg. in Dallas—by Dr. Pepper Co., Dallas. 11-13

DALLAS CO.—**E. C. Martin**, 4906 Reiger St., Dallas—$40,000 for laundry and cleaning plant at 4103-9 Swiss St., Dallas—by Charles S. Bell, Dallas. 11-16

DALLAS CO.—**Robert E. McKee**, Box 2848, Dallas—$214,800 for auto sales service bldg. at Ross and St. Paul Sts., Dallas—by Johnson Bros. Chevrolet Co., Dallas. 11-26

DALLAS CO.—**J. Edward Smith**, Dallas—$70,000 for one-story warehouse at 2850 Gaston St., Dallas—by T. & P. Railway Co., Dallas. 11-14

EL PASO CO.—**Stone & Webster Engr. Co.**, Esperson Bldg., Houston — $600,000 for a boiler plant in El Paso—by El Paso Electric Co., El Paso. 11-1

KERR CO. — **Robert E. McKee**, Drawer 562, El Paso—$1,877,000 for additional buildings and utilities on Project No. 2469, Legion — by Veterans Administration, Washington, D. C. 11-15

MEDINA CO. — **Baugh & Scott**, 1107 Frost Bank Bldg., San Antonio—for hospital addition in Hondo—by Mrs. Cook, Hondo. 11-15

NUECES CO.—**J. W. Bermingham**, Lovenskiold Bldg., Corpus Christi—$47,363 for addition and alterations to bldg. in Corpus Christi—by E. A. Jones, Corpus Christi.

NUECES CO.—**E. E. Harrison**, Box 162, Corpus Christi—$140,493 for expansion and remodeling YMCA bldg. at 714 S. Broadway, Corpus Christi—by YMCA, Corpus Christi. 11-20

TARRANT CO.—**Cain & Cain**, 406 Majestic Bldg., Fort Worth—$95,000 for one and two-story bldg. on W. 7th St., Fort Worth—by Western Olds Co., Fort Worth. 11-23

TARRANT CO.—**Dolph Construction Co.**, 511 Thomas Bldg., Dallas—$187,334 for church bldg. for the First Baptist Church in Arlington—by First Baptist Church, Arlington. 11-5

TAYLOR CO.—**C. S. Oates & Son**, Abilene—$220,000 for completion of women's dormitory and dining hall and President Hall in Abilene — by McMurry College, Abilene. 11-14

Utah

SALT LAKE CO.—**Ellis W. Barker**, 300-1 Ness Bldg., Salt Lake City—$40,000 for shop addition in Salt Lake City—by L. H. Strong Motor Co., Salt Lake City. 11-21

WEBER CO.—**Fullmer Bros.**, 16600 Jefferson St., Salt Lake City—$44,749 for telephone bldg. addition at Ogden—by Mountain States Telephone and Telegraph Co., Ogden. 11-21

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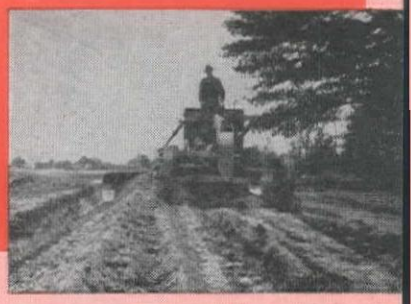

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Washington

BENTON CO.—**G. M. Barber,** Prosser—$49,900 for hospital in Prosser—by Directors of Prosser Hospital Assoc., Prosser. 11-1

EVERETT CO.—**Atherton Construction Co.,** Terminal Bldg., Seattle—$184,946 for one-story brick school on Peck's Dr., Everett—by School Board, Everett. 11-23

FRANKLIN CO.—**Addison Miller Construction Co.** and **James Construction Co.,** Arctic Bldg., Seattle—$200,000 for installation of machinery and conc. insulated addition to an ice house in Pasco — by Northern Pacific Railroad Co., Pasco. 11-10

KING CO.—**O. B. Daniels,** 603 Orpheum Bldg., Seattle—$40,000 for a one-story masonry building on Dexter Ave., Seattle—by E. F. Tindolph Co., Seattle. 10-30

KING CO.—**E. F. Shuck,** 4th and Cherry Bldg., Seattle—$55,000 for warehouse addition at 812 Howell St., Seattle—by D. N. & E. Walter Co., Seattle. 11-26

PIERCE CO. — **Roy Earley,** Tacoma — $120,000 for 120 by 310 ft. furniture bldg. in Tacoma—by Westwood Furniture Co., Tacoma. 11-20

SPOKANE CO.—**James E. Crick,** 1005 Overbluff, Spokane—$500,000 for 5-story brick and reinf. conc. medical bldg. in Spokane—by self. 11-20

WHATCOM CO.—**The Austin Co.,** Dexter Horton Bldg., Seattle—$100,000 for dual receiving platform and tunnel at Lynden dairy plant—by Whatcom Co. Dairymen's Association, Lynden. 11-8

WHATCOM CO.—**Chisholm and Eiford,** Box 54, Bellingham—$272,700 for a grade school building in Nooksack—by Nooksack County School District, Nooksack. 11-10

Miscellaneous . . .

California

LOS ANGELES CO.—**P. J. Walker Co.,** 3900 Whiteside Ave., Los Angeles—$250,000 for conversion of old hydraulic elevators into new electric elevators at 659 S. Broadway, Los Angeles — by Bullock's Dept. Store, Los Angeles. 11-2

SAN DIEGO CO.—**California Electric Works,** 424 8th Ave., San Diego—$44,400 for alter. of electric distribution system of Unit No. 1, at the Naval Hospital, San Diego—by Bureau of Yards and Docks, Washington, D. C. 11-29

SAN FRANCISCO CO. — **George M. Robinson & Co.,** 451 Folsom St., San Francisco—$77,722 for inst. sprinkler system in Letterman Genl. Hospital, San Francisco —by U. S. Engineer Office, San Francisco. 11-8

Colorado

PROWERS CO. — **Snyder & Johnson,** Humboldt, Iowa — $93,803 for 60 mi. of transmission lines and conversion of 15 mi. of the existing line in Prowers Co.—by Southeast Colo. Power Assoc., La Junta. 11-15

Nebraska

PERKINS CO.—**Cater Electric Construction Co.,** 1016 Baltimore Ave., Kansas City, Mo.—$386,770 for 482.2 mi. of electric line in Perkins Co.—by Midwest Electric Membership Corp., Grant. 10-29

New Mexico

COLFAX CO.—**Bridgeman Construction Co.,** Albuquerque—$160,946 for 175 mi. of electric line in Colfax Co.—by Springer Electric Cooperative, Inc., Springer. 11-7

SIERRA CO. — **Fritz Ziebarth,** 820 W. Esther St., Long Beach, Calif.—for 90 mi. of rural electric line at Hot Springs—by Sierra Electric Cooperative, Hot Springs. 11-19

Oregon

MULTNOMAH CO.—**Fluor Corp., Ltd.,** 2500 S. Atlantic Blvd., Los Angeles—for installation of process equipment for new asphalt plant at Willbridge, near Portland —by Calif. Asphalt Corp., San Francisco, Calif. 11-14

MULTNOMAH CO. — **Chicago Bridge and Iron Co.,** Chicago, Ill.—for tankage construction for new asphalt plant at Willbridge, near Portland—by Calif. Asphalt Corp., San Francisco, Calif. 11-14

Texas

GONZALES CO.—**Stovall Construction Co.,** Dallas—for 346 mi. of rural electric lines in Gonzales, Lavacca and Guadalupe counties—by Guadalupe Valley Cooperative. 11-23

KIMBLE CO.—**Taylor Construction Co.,** Box 648, Taylor—$102,886 for 165 mi. of rural electric lines in Junction—by Kimble Electric Cooperative, Junction. 11-13

MEDINA CO. — **Sisco Electric Co.,** 200 Chambers St., Conroe—$187,458 for 275 mi. of electric line in Medina County—by Medina Electric Cooperative, Inc., Hondo. 11-7

Utah

GARFIELD CO.—**R. N. Campsey Construction Co.**, 2520 Leyden St., Denver, Colo.—$68,050 for 73 mi. of electric line in Garfield Co.—by Garkane Power Assoc., Inc., Richfield. 10-29

Washington

KING CO.—**Viking Automatic Sprinkler Co.**, 1120 8th Ave., N., Seattle—$75,078 for installing auto. sprinklers and firewalls at Naval Hospital, Seattle — by 13th Naval District, Seattle. 11-29

SNOHOMISH, SKAGIT AND WHATCOM COS.—**Goetz & Brennan**, Seaboard Bldg., Seattle—$440,320 for clearing right-of-way for Arlington-Bellingham-Blaine transmission line, about 71 mi. long—by Bonneville Power Administration, Portland, Ore. 11-19

Wyoming

HOT SPRINGS CO. — **Pepper Tank & Contracting Co.**, Casper—$300,000 (est.) for laying a pipe from the Hamilton Dome oil field to Thermopolis, 23½ mi.—by D. R. Bumford, Minneapolis, Minn. 11-2

Foreign

HONDURAS—**Choluteca Honduras Development Co.**, 602 Platt Bldg., Portland, Ore. — for fruit canneries, transmission lines, transportation facilities, hydroelectric projects and sawmills in Honduras—by Republic of Honduras. 11-16

MEXICO—**Ace Electric Co.**, 1492 J St., San Diego, Calif.—for overhead distribution service, 12 kv. lines entering Mexico from San Diego and two major substations each having three 1000 kv. transformers at Tijuana — by Border Electric and Telephone Co., Tijuana. 11-21

PROPOSED PROJECTS

Dam . . .

Texas

NUECES CO.—A $5,300,000 dam is being planned by Corpus Christi water engineers. It will be built below the Mathis Dam on the Nueces River. 11-19

Building . . .

California

ALAMEDA CO.—The First District Agricultural Association, Oakland, plans to build a $1,500,000 sports palace at 10th and Fallon Sts., Oakland. The building will be used for garden shows, horse and dog shows, ice shows and other events. 11-2

ALAMEDA CO.—Swift & Co., Chicago, Ill., and South San Francisco, are planning a $200,000 fertilizer plant. They will build it on a six-acre tract at the southwest city limits on Winton Ave., Hayward. 11-2

LOS ANGELES CO.—Ball Bros., Muncie, Ind., makers of glass containers, plan to construct a factory on 30 acres on Valley Blvd., El Monte. Work on the $4,000,000 job will begin early next year.

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

Harry B. Ogle has been named sales manager of the Governmental Sales Division for CAPITOL TRACTOR & EQUIPMENT CO., Sacramento, Calif. Ogle is well known in the machinery business having been employed for the past nine years with two well-known Northern California firms. In his new connection he will have charge of city, county and state sales and will supervise the introduction of many new machines and developments which Capitol Tractor will introduce in the next few months.

☆ ☆ ☆

Election of THE CONNER COMPANY, San Francisco advertising agency, to membership in the First Advertising Agency Group has been announced by **E. W. Conner.** Other Western agencies affiliated with the group include THE MAYERS CO., Los Angeles, and W. E. FEATHERSTONE ADVERTISING AGENCY of Salt Lake City.

☆ ☆ ☆

Lt. Col. Byrne C. Manson, recently released from the armed services, has joined the staff of the CALIFORNIA REDWOOD ASSOCIATION to actively conduct the postwar research program of its Redwood Seasoning Committee. This committee was set up two years ago by kiln operators at the various redwood lumber mills to further advance the technique of drying durable and versatile redwood.

☆ ☆ ☆

Doyle Mowrer has been made western division sales manager for J. D. ADAMS MANUFACTURING CO., in charge of all states west of the Mississippi River. He has been with the company 26 years and

MOWRER

HOFFMAN

was recently district sales manager in Texas. Assisting him will be **Don Hoffman,** recently district sales manager in the southwestern states. His headquarters will be San Francisco.

☆ ☆ ☆

Charles P. Pinckard and **Steven B. Derringer** are two newly-named sales engineers for the BROWN-BEVIS EQUIPMENT CO., Los Angeles, Calif. Pinckard, formerly with Cooperative Building Materials Co. and also Eastside Building Materials Co., will specialize on rock plants and ready-mix installation, while Derringer will concentrate on industrial applications. **James H. Gregory,** formerly with Barber-Greene Co., Aurora, Ill., will be in charge of sales promotion, and **N. A. Ellenburg,** formerly of Consolidated Vultee, is a new addition to the service department.

☆ ☆ ☆

C. F. Borden, former manager of the general sales service department of Geneva Steel Co., has been named district manager of sales for Northern California, for KAISER COMPANY, INC., Iron and Steel Division, Oakland, Calif. **Richard L. Erlin,** a veteran of 15 years in the steel business, has been appointed manager of sales service for the same company. Both men will operate out of the Oakland headquarters of Kaiser Company, Inc. Borden was assistant to the vice president in charge of construction for the Defense Plant Div. of Columbia Steel, Chicago, Ill., before joining the Geneva organization. Erlin has been assistant general sales manager up until this time, having been with Kaiser Steel since Sept., 1944, and was previously connected in an administrative or sales capacity with Tubular Alloy Steel Corp., Gary, Ind., Defense Plant Div. of Columbia Steel, Chicago and Washington, D. C., and Columbia Steel Co., San Francisco.

☆ ☆ ☆

Earl F. Noyes has been appointed sales manager of the ARROWHEAD RUBBER CO., Los Angeles, Calif., a division of NATIONAL MOTOR BEARING CO.

He will be in charge of development of new markets for the company's molded rubber products.

☆ ☆ ☆

A. F. Garlinghouse of GARLINGHOUSE BROS., Los Angeles, Calif., is chairman of a committee appointed by Associated Equipment Distributors, to study veteran employment and rehabilitation problems. **A. F. Sersanous** of LOGGERS & CONTRACTORS MACHINERY CO., Portland, Ore., is also a member of the committee.

☆ ☆ ☆

A. J. (Al) Stream has been elected a vice president of PLANT RUBBER & ASBESTOS WORKS, San Francisco, Calif., having been assistant general manager of the company for the past five years. The company manufactures heat insulation and mechanical packing materials.

☆ ☆ ☆

Victor A. Lepkey, Oakland, Calif., has received a WPB citation making employees of BETHLEHEM STEEL CO.'S yard in San Francisco top honor holders among the nation's shipyards for production suggestions. Only three individual citations, which represent the highest honor bestowed for production suggestions, have been made to shipyard employees throughout the nation, and employees at Bethlehem's San Francisco yard have won two of them. **Robert B. Brown,** jig shop supervisor at Bethlehem yard, won the first award, in 1943, for 15 suggestions which speeded production in shipbuilding operations. Lepkey, who received his citation last month, won his award for 11 suggestions presented in May of this year.

☆ ☆ ☆

Albert P. Hahn, until recently a lieutenant-commander in the Seabees, has joined the sales force of the BROWN-BEVIS EQUIPMENT CO., Los Angeles, Calif. Prior to the war he was connected with the EDWARD R. BACON CO. in San Francisco, and for part of his time in the service was in charge of the Navy equipment repair depot at Vernon, Calif.

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STANDARD MACHINERY CO., San Francisco, Calif., has been appointed exclusive representative in Northern California for ROSCO MANUFACTURING CO., manufacturers of bituminous distributors, street flushers, road brooms, tar kettles and other road equipment.

☆ ☆ ☆

G. L. Van der Boom, formerly advertising manager of SOUTHWEST WELDING & MANUFACTURING CO., Alhambra, Calif., has joined RUSSELL P. OSTRANDER, ADVERTISING, in the capacity of account executive.

☆ ☆ ☆

PACIFIC NORTHWEST

CHARLES R. WATTS & CO., veteran construction equipment dealers of Seattle, Wash., have completed a new warehouse and office building at Leary Way and Sixth Ave., NW., Seattle. Officials of the company are, **W. R. Yeakel, Ray A. Young, Tom Pickering** and **Vernon Taylor.**

☆ ☆ ☆

E. L. Aikins has been appointed district manager of the ALLIS-CHALMERS TRACTOR DIVISION office in Seattle, Wash. He will represent Allis-Chalmers interests in Alaska, the Yukon and British Columbia. He succeeds **S. B. Tatom,** re-

cently resigned to become president of LOMEN EQUIPMENT, INC., who handles Allis-Chalmers tractors and equipment in Alaska. The British Columbia and Yukon territory is served by RENDELL TRACTOR & EQUIPMENT CO., LTD., Vancouver, B. C.

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Kenneth W. Thomas has been appointed to the Spokane, Wash., staff of WESTINGHOUSE ELECTRIC CORP. as a sales assistant. He is a native of Seattle.

☆ ☆ ☆

AIR CLEANER SERVICE CO., Glencullen, Ore., manufacturer of the Cyclon Oil Filter, has opened a new plant in Ontario, Canada, and **Gordon McKercher** of Portland has been named Manager.

William D. (Pete) Haley has been appointed assistant to **William C. Champion,** Pacific Northwest District Manager for the Shovel and Crane Division of LIMA LOCOMOTIVE WORKS, INC. Haley has been with the company for the past fifteen years. The firm plans to enlarge its repair service in Seattle for the benefit of contractors in the area.

☆ ☆ ☆

The HOMELITE CORPPORATION, Port Chester, N. Y., has opened a new branch office in the Terminal Sales Bldg., Seattle, Wash. **A. D. Sherwood** will be in charge of the office. He was recently released from active duty with the U. S. Navy, after serving over two years as a lieutenant in the Naval Air Corps.

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MILWAUKIE MACHINERY CO. of Portland, Ore., and the CASCADE MACHINERY CO. of Seattle, Wash., have been appointed exclusive distributors in their territories for pumps manufactured by FAIRBANKS, MORSE & CO. and their subsidiary companies. **W. H. Perry** will be in charge of the pump department for Milwaukie and **Clyde A. Retter** will head the Cascade pump department.

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HOTCHKISS-GILKEY CO. of Spokane, Wash., has been appointed distributor in that area for Sealmaster Ball Bearings, it was announced recently by the STEPHENS-ADAMSON MFG. CO., Los Angeles, Calif.

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INTERNATIONAL AGENCIES & MACHINERY CO., LTD., Vancouver, B. C., has been appointed to represent the construction and industrial divisions of BARBER-GREENE CO. in the Province of British Columbia and the Yukon Territory. **M. A. G. Malcomson,** vice president and general manager, is in charge of the company's operations.

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INTERMOUNTAIN

FRUEHAUF TRAILER CO. has completed a new plant in Phoenix, Ariz. The building covers 36,000 sq. ft. and is located at 902 S. Seventh St. **C. V. (Cap) Gulley** is manager of the Fruehauf operations at Phoenix. The original Phoenix branch was

opened last year, when Fruehauf purchased the building and facilities of Anchor Body and Steel Mfg. Co. The new building will permit repair and servicing of 30 large truck units at one time.

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E. N. Black, who has been in charge of the Wyoming operations of INTERNATIONAL HARVESTER CO. since 1943, has been promoted to the position of superintendent of the Springfield, Mo., branch of the company.

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AMONG THE MANUFACTURERS

Brig. W. E. R. Blood, in charge of the British Army Engineers' headquarters at Washington, D. C., is managing director designate of the new LeTOURNEAU

CO. branch factory to be built in England. Serving as plant manager of the British factory will be **Maurice Foote,** promoted from superintendent of LeTourneau Plant No. 1 at Peoria, Ill. **Denn M. Burgess,** executive vice president of the LeTourneau company, is in England now to inaugurate action on the subject and to select the necessary plant properties.

☆ ☆ ☆

TEMPLETON, KENLY & CO. of Chicago, Ill., prominent in the manufacture of industrial jacks since 1899, has been granted the Army-Navy production award. Their most prominent contribution to the war was a special track connector for mounting, demounting and repair of tank crawler treads. **J. B. Templeton,** president, announced that the "E" burgee was raised and ceremonies were held at the company plant in Chicago, Ill., Aug. 10.

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H. T. Brettelle, formerly advertising and publicity director for the Detroit Diesel Division of GENERAL MOTORS, has joined the staff of GRANT ADVERTISING, INC., Detroit, as an account executive.

☆ ☆ ☆

C. W. Guyatt, formerly chief industrial engineer for AMERICAN STEEL AND WIRE COMPANY, has been appointed assistant to **C. D. King,** chairman of operating committees, UNITED STATES STEEL CORPORATION OF DELAWARE. Guyatt joined the American Steel and Wire Co. in 1935 as industrial engineer. Guyatt will assist King in the establishment of production standards for all U. S. Steel subsidiary manufacturing companies.

Donald A. Koehler has been appointed to the newly-created post of commodity director, responsible for coordination of procurement and production schedules for the INSLEY MANUFACTURING CORP., Indianapolis, Ind. Before joining Insley, Koehler was for several years with the Chicago office of the Bureau of Yards and Docks as head of the procurement division for heavy-duty and automotive equipment. Prior to that time he owned his own business, the Koehler Construction Co., at Lincoln, Neb.

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A. J. Bartlett is now responsible for the sale of industrial engines to original equipment manufacturers, for LE ROI COMPANY, of Milwaukee, Wis. Bartlett has been with the company since 1935 and brings a wealth of experience to this new department. Starting as a draftsman 10 years ago, he progressed through the Experimental Dept., and the Sales Dept., which he joined in 1938 as a sales engineer, where his work consisted of organizing the product order department and handling engineering and engine application sales.

☆ ☆ ☆

T. J. Kauer has been appointed managing director of the WIRE REINFORCEMENT INSTITUTE with offices in the National Press Bldg., Washington, D. C. He was formerly assistant managing director of AMERICAN CONCRETE PIPE ASSN.

Henry Crown was elected chairman of the board of directors of MATERIAL SERVICE CORPORATION recently, upon his retirement from active service with the U. S. Army Corps of Engineers. Associated with the builders' supplies firm since its establishment in 1919, Crown resigned as chairman of the board upon entering the service in 1942, although continuing his board membership. While in the service, Col. Crown retained his memberships on the board of directors of the Baltimore and Ohio, Chicago Terminal Railroad Co., the Morrison Hotel Corp., Freeman Coal Mining Co., and as director and vice president of the Chatham Building Corp.

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The War Department has authorized CHAIN BELT COMPANY of Milwaukee, Wis., to add a fourth star to its Army-Navy "E" pennant. Their original flag was awarded in Sept., 1942. The first star was authorized in 1943 and two additional ones in 1944. Chain Belt Company's war work included the manufacture of tank turrets, gun shields, triturators, ammunition hoists, tank treads and a variety of howitzers and cannon.

☆ ☆ ☆

W. J. HAZELTINE

W. J. Hazeltine, formerly vice president in charge of distribution, has been named general sales manager of the BUFFALO-SPRINGFIELD ROLLER CO., Springfield, Ohio. In the civil engineering and construction fields since 1913, Hazeltine's activities throughout the country have made him one of the best-known men in the construction industry. He joined the Buffalo-Springfield Roller Co. in 1922 as direct sales representative, and more recently he has been responsible for the establishment of a company distributor's organization for the United States. He is also a member of the board of trustees of Ohio Northern University, and a member of the advisory committee of the Construction Machinery Branch of the OPA.

☆ ☆ ☆

R. W. McLaughlin has joined CARRIER CORPORATION, Syracuse, N. Y., as assistant director of development in charge of the heavy machinery engineering section. McLaughlin's chief assignment has to do with supervision of design and development for centrifugal compressors used in large refrigeration and air conditioning installation. Prior to joining the Carrier or-

ganization, he was chief engineer of the blower and supercharger division of the Elliott Co., Jeanette, Pa.

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Sidney E. McCrum, previously in the advertising department of CHICAGO PNEUMATIC TOOL CO., has been made assistant advertising manager of WICKWIRE SPENCER STEEL CO., New York City.

☆ ☆ ☆

Lloyd B. Smith, son of the late **L. E. Smith,** for many years chairman of the board of A. O. SMITH CORP., was recently elected vice-president and member of the board. At the same time, **Morris J. Vollmer** was named assistant secretary and assistant treasurer, and **A. von Wening,** vice-president and controller, was elected to the board.

☆ ☆ ☆

Gordon W. Monfort has been appointed director of the News Bureau for CATERPILLAR TRACTOR CO., with headquarters in Peoria, Ill. Since early in the war he has been personnel director at Caterpillar's San Leandro, Calif., plant, and previous to that was western division advertising representative.

☆ ☆ ☆

M. B. Elliott has been appointed manager of the Unit Equipment Division of GENERAL ELECTRIC'S Central Station Division which was established June 1. The new division will be responsible for the development, promotion, and sale of complete electric equipments such as unit substations and mobile units. The new division will consist of two sections, with **D. E. Craig** in charge of the Unit Substation Section and **W. N. Oberly** handling the Unit Generating Section.

☆ ☆ ☆

LeRoy Keane has been appointed director of sales of the Explosive Dept., HERCULES POWDER CO., of Wilmington, Del., it was announced recently. He succeeds **C. C. Gerow,** who has been director of sales since 1919. Keane joined Hercules as a salesman in Dayton, Ohio, in 1918, and in 1936 he became manager of the Pittsburgh office and has continued in that capacity until the present.

☆ ☆ ☆

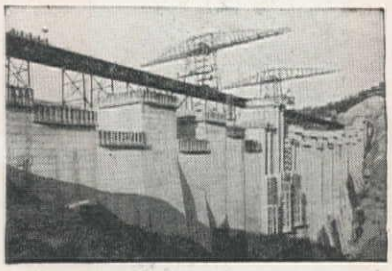
Plans for modernization of the Gary, Ind., plant of the AMERICAN BRIDGE CO. to meet increasing demands for fabricated steel in mid-western and western states were announced recently by **L. A. Paddick,** president of this United States Steel Corp. subsidiary. The plant will turn out structural steel for all types of steel construction.

☆ ☆ ☆

J. W. Foster, advertising manager of the BUFFALO-SPRINGFIELD ROLLER CO., Springfield, Ohio, is now going into business for himself. Joining the company back in 1925, Foster worked his way up through the service, sales, and purchasing departments. His future plans include the launching of a commercial photography studio in Springfield, Ohio.

NEW EQUIPMENT

Electric Hoist Mechanism



Manufacturer: General Electric Company, San Francisco, Calif.

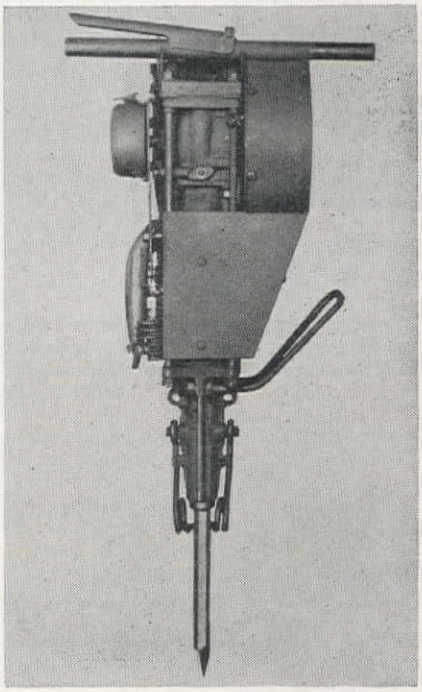
Equipment: Maxispeed system for automatically controlling crane speeds.

Features claimed: The drive is recommended for hoists which handle a wide range of loads, and where accuracy, speed, refined performance, and safety are important. The new drive, which automatically measures the load so that it is hoisted and lowered at the maximum safe speed yet prevents the handling of dangerous overloads, is designed for use on either indoor overhead, slow-speed cranes, or high-speed cranes of the outdoor construction type. The drive operates from either AC or DC incoming power. If used with AC, the drive consists of a generator, cross-flux exciter, and ordinary constant-voltage exciter, all driven by an induction motor. If used with DC, a shunt-wound DC motor drives the generator and cross-flux exciter. In operation, heavy loads are both hoisted and lowered at slow speeds, and light loads or the empty hook are hoisted and lowered at high speeds. These speed changes are inherent in the drive and do not depend on the functioning of the control devices. Dynamic-braking is used in lowering heavy loads to return power to the system instead of being dissipated in resistors. A solenoid brake holds the load when at rest.

Paving Breaker

Manufacturer: Syntron Company, Homer City, Pa.

Equipment: Self-contained, portable gasoline hammer.



Features claimed: A redesigned nose-end piece utilizes the resiliency of a spring-tool retaining clip, providing easy spring action of the tool itself when used at maximum over-travel. This same nose-end provides a quicker and easier method of changing tools in the hammer. The syntron is a highly mobile and independent piece of equipment capable of operating away from cumbersome secondary power units.

Dump Trailer

Manufacturer: Athey Products Corporation, Chicago, Ill.

Equipment: PD-10 trailer.

Features claimed: This new two-way dump trailer is designed for use with the Caterpillar DW-10 Tractor for high-speed hauling on construction, mining and other earth-moving projects. The trailer has a maximum capacity of 15 tons. It is hydraulically-controlled and discharges its load from either side of its two-way dump body at a 55-deg. angle. The unit is 21 ft. long, 9 ft. 4 in. wide, and is mounted on 1400x20, 16-ply tires.

New Lorain Series

Manufacturer: Thew Shovel Co., Lorain, Ohio.

Equipment: Four new heavy-duty shovels.

Features claimed: A new series of Lorain shovels known as the "41" series, consists of one chain-drive crawler machine

and three rubber-tired vehicles. The crawler machine has two speeds of movement, and is convertible to shovel, crane, dragline, clamshell or back-digger. The four-wheel drive Moto-crane is of 20-ton capacity with 10 speeds forward and 2 reverse. The six-wheel drive Moto-crane has double reduction drive on all axles, 8 speeds forward and 2 reverse. Steering is air-assisted and air brakes are on all wheels. The fourth model is a single-engine, single-operator type self-propelled crane, power being supplied on 4 worm-driven rear wheels. The hoist, swing, travel, and boom derricking may be effected simultaneously. Capacity is 20 tons.

Flexible 2-yd. Scraper

Manufacturer: LaPlant - Choate Manufacturing Co., Cedar Rapids, Iowa.

Equipment: Model CW-2 front dump scraper.

Features claimed: A sturdy yet light scraper weighing only 2,550 lb., capable of making a 90 degree turn within a circle diameter of 20 ft. The hitch is designed to operate behind high speed rubber-tired industrial tractors. Hydraulically operated through a three position valve which enables the operator to hold the cutting edge in position and exert effective down pressure. Because of the flexibility and high speed operation this model is especially adapted to back filling bridges and foundations, grading and landscaping work. The

CW-2 is the industrial counterpart of the famous air-borne scrapers used in many isolated air bases for construction and maintenance operations.

Cable-controlled Bulldozer

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Equipment: Bulldozer.

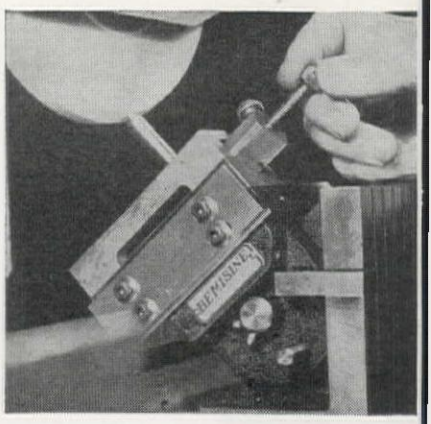
Features claimed: A new Caterpillar cable-controlled bulldozer which eliminates the overhead A-frame is in production and will soon be ready for delivery. The new models are Caterpillar No. 8S and 7S (straight blade) and 8A and 7A (angling blade) bulldozers, designed to fit and be an integral part of the Diesel tractors D8, D7, and D6 models. Among the outstanding advantages of Caterpillar bulldozers are: balanced design, great capacity, rigid construction, elimination of A-frame to provide safe operation and fine visibility. The new line of bulldozers provides the user with unit manufacture and one service source.

Angle Dressing Device

Manufacturer: Nichols-Morris Corporation, New York, N. Y.

Equipment: Angle dressing device for surface grinder wheels.

Features claimed: A new device for dressing precise angles on surface grinder wheels, which is fitted with a slide member carrying a diamond dressing tool. The diamond tool is mounted on an adjustable sine-angle plate which locates on the magnetic chuck directly below the grinding



wheel. Application of the familiar sine-bar principle is used in tilting the sine plate precisely to the desired angle. Ordinary 2-in. micrometers are the only measuring instrument required to set any angle from 0 to 90 degrees to accuracy within one minute of arc in a minute's time. After the desired angle is determined, the diamond is brought in contact with the wheel and the slide is moved back and forth manually to generate a corresponding angle on the wheel. When not required, the attachment can be quickly removed from the sine-angle plate leaving a working surface prepared for holding small parts at accurate angles for grinding, milling, or jig-boring operations. In this manner the tool serves a double purpose.

Trench Excavator

Manufacturer: Parsons Company, Newton, Iowa.

Equipment: Parsons trenchliner.

Features claimed: The No. 200 wheel trenchliner and No. 221 ladder type trencher have been added to the Parsons line of excavating machinery. Model 200 will dig to a depth of 5 ft. 6 in. in widths from 15 to 26 in. Digging speeds range up to 118 ft. per minute. The wheel of the 200 trenchliner is pivot-mounted to the frame. Dirt-catching slide tracks have been eliminated, and wheel bottom support has been improved with two double-wheeled dollies supporting this point. The 221 trenchliner is a smaller edition of the well-known model 250. A ladder type machine, the 221 digs up to 8 ft. deep, in widths from 16 to 36 in. It is equipped with a telescoping, shiftable boom, the Parsons arched frame and the direct power flow arrangement that increases production on the trenchliner.

Corrosion-resistant Coatings

Manufacturer: Protective Coatings Inc. Detroit, Mich.

Equipment: Protective corrosion-resistant coatings.

Features claimed: A protective paint in which the size of solid content is reduced to .001 micron. This enables the coating to thoroughly penetrate the pores and surface imperfections of wood, concrete, and metals effectively blocking off moisture penetration, acid reaction, retarding corrosion rotting and disintegration of the structural material. The Alkacite series of protective coatings now planned include 12 or more formulations to meet a wide range of industrial needs. Alkacite No. 101, a high solid, sprayable, high coverage base, prime or finish coat of glossy black that forms a dense, smooth film for the protection of structural steel. Alkacite No. 102 is a heavier general use formulation for brushing. Alkacite No. 103 Aluminum coating has distinctive advantages over ordinary alu

minum paints and will cover up to 1,200 sq. ft. per gallon by spraying. The line of Alkacite coating is especially useful in the protection of plant structures and equipment, including tanks, bridges, tunnels, viaducts, conduits, drainage and gas and oil pipes. A marine copper for ship bottoms, and red oxide primer for commercial uses will be included in the Alkacite series.

Portable Service Station

Manufacturer: D. W. Onan & Sons, Minneapolis, Minn.

Equipment: A portable equipment lubricator and service unit.

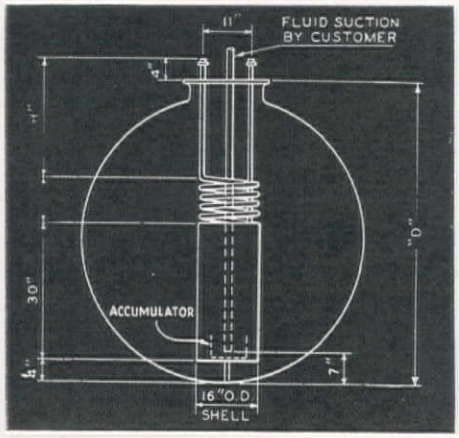
Features claimed: Mounted on truck or trailer, this service unit brings high-pressure lubrication and related services out to the job where trucks and construction machinery are operating. It is completely self-contained, with lubricant tanks, hose reels, compression pumps, tools and accessories built in. Outstanding in the features is the Onan OTC-2 electric generating plant, mounted on the air compressor tank, which in addition to furnishing current for the lights and battery charging, serves as a prime mover for the air compressor. The plant generates 1,500 watts of power at 115-volts, 60 cycle, single phase alternating current. It is driven by a two-cylinder, air cooled, gasoline engine developing 3.1 h.p. at 1,800 r.p.m. The unit is equipped with remote control push buttons which enable the operator to start the engine by using the generator as a starting motor energized by the storage battery current. A separate D. C. circuit connected to the exciter winding provides the current for battery charging. The unit is capable of furnishing light for night work and repairs to equipment and will power electric tool used by mechanics on the job.

Bulk Tank Preheater

Manufacturer: Rempe Co., Chicago, Ill.

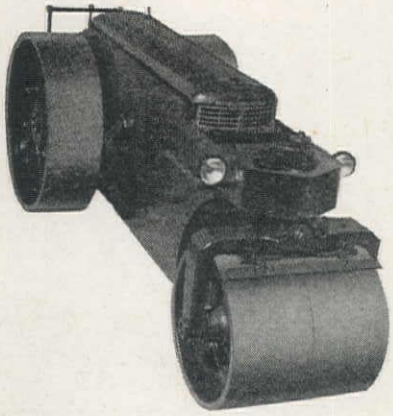
Equipment: A tank preheater for heavy oils.

Features claimed: This preheater can be made to fit any size tank having a manhole 16½ in. or larger. It is installed by cutting or drilling holes in the manhole cover for the circulation and suction pipes. Built for use with steam or hot water as desired. The coil is constructed of 1½-in. standard



steel pipe with an OD coil diameter of 16 in. An accumulator built into the unit so that the oil must flow over the coil to reach the suction pipe assures preheating of the oil. The coil provides 38 sq. ft. of direct radiation surface and 10 sq. ft. of secondary shell heating surface is furnished by the

enclosing casing. Designed to preheat oils, tar and asphalt to reduce their viscosity and facilitate transfer of these bulk oils.



Three-wheel Roller

Manufacturer: Buffalo-Springfield Roller Company, Springfield, Ohio.

Equipment: Ten and twelve-ton, three-wheel roller.

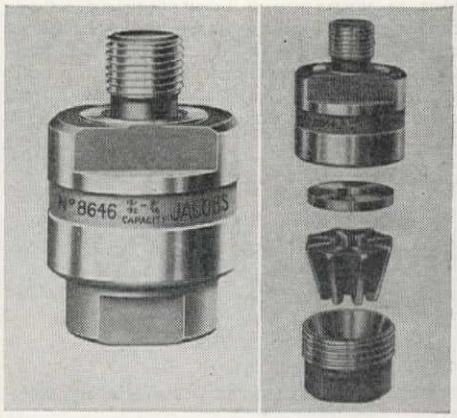
Features claimed: A new road roller equipped with a four-speed transmission providing a wide selection of speeds without resorting to inefficient throttle control. Also inclosed in the transmission is a bevel gear differential all inclosed in one accurately machined housing. The entire unit is supported on a rugged all-welded steel channel frame. Steering is accomplished by a low-pressure hydraulic system, providing the operator with instant and effortless control of the equipment.

Drill Chuck

Manufacturer: Jacobs Manufacturing Co., Hartford, Connecticut.

Equipment: Rubber-flex collet for drill chuck.

Features claimed: A radically new type of heavy duty drill chuck, in which a tough web of neoprene synthetic rubber keeps the jaws in better alignment and permits one chuck to take a wider range of drill sizes. The rubber is bonded to the steel jaws and passes through anchoring holes in them. In this manner the rubber replaces the traditional flexible spring steel collet shank. The rubber-flex collet is tightened by a screw mechanism which forces it forward into the smooth funnel-shaped nose of the chuck. As soon as the chuck is loosened, for changing drills, the neoprene web pushes the jaws apart and releases the drill shank. The use of neoprene for this function is due to its oil-resistance and its low degree of permanent deformation or set.



Portable Concrete Mixer

Manufacturer: Chain Belt Company, Milwaukee, Wisconsin.

Equipment: Rex 6S concrete mixer.

Features claimed: First to be in actual production is the new Rex 6S, which includes redesigned chassis, low overall height, wide wheel tread and low center of gravity. These features make this model easy to tow and spot on the job. New convenient controls, grouped on one side of the machine, a new water system and new drum design result in easier operation and better mixing qualities.

LITERATURE FROM MANUFACTURERS . . .

Copies of the bulletins and catalogs mentioned in this column may be had by addressing a request to the *Western Construction News*, 503 Market Street, San Francisco, California.

Air Reduction, New York, N. Y.—Catalog No. 40 gives the price list for gas welding and cutting supplies and accessories. Some of the properties and uses of rods of different materials are described. There are illustrations of welding hose and of accessories such as goggles, gloves and spark-lighters.

McKiernan-Terry Corp., New York, N. Y.—An attractive, colorful booklet has been issued by this company recently. Its 16 pages give the specifications and parts drawings of the Blacker Power Hammer. The black and orange bulletin also shows several photographs of the hammer and lists savings and advantages claimed for it. Request Bulletin No. 56.

R. G. LeTourneau, Inc., Peoria, Ill.—This company now offers a quick-reference chart which stresses the use of the right

(Continued on page 158)

OPPORTUNITY SECTION

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CARRYALL SCRAPERS
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Equipped with 8—12 x 24 Tires in good shape.

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Compressor, 868 C.F.M. Sullivan, with 150 H.P. motor, belt and idler; Compressor, 1052 C.F.M. Sullivan, with 200 H.P. Synchronous Motor; Mucker, No. 75 Conway with 440 volt motor, 36" gauge; Mucker, No. 60 Conway, 440 volt motor, 36" gauge; Electric Locomotives, 36" gauge, Goodman, 6-ton; Electric Locomotives, 36" gauge, Mancha, 5-ton; Muck Cars, 3 and 5 cu. yd., 36" gauge; Tunnel Forms, Remover, Buckets, Mixers, Hammers.

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Western city, 150,000 population. Mixers—dump trucks—300-bbl. bulk cement bin. Sand and gravel pits with operating machinery. Detailed information on request. Write—Box 942, WESTERN CONSTRUCTION NEWS, 503 Market Street, San Francisco, California.

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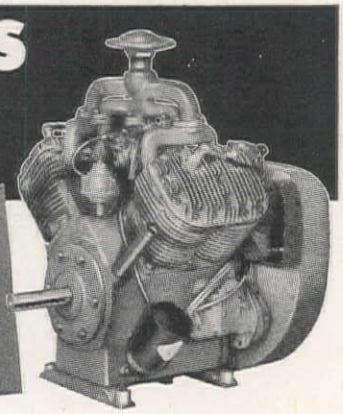

ON ALL WISCONSIN 4-Cylinder V-Type Air-Cooled ENGINES

The cylinders on all V-type Wisconsin Air-Cooled Engines are cast in pairs, separate from the crankcase, for quick, economical servicing when required. In case a cylinder is accidentally scored beyond the possibility of reboring, it is only necessary to replace a relatively inexpensive pair of cylinders instead of an entire engine block. The picture shows the Model VE-4 Wisconsin Engine, with protective shrouding removed, illustrating method of attaching cylinders.

WESTERN DISTRIBUTORS:

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electrode for each welding job. The Tournaweld electrodes serve all welding needs but are especially adapted to the varied requirements in manufacturing and in the repair and maintenance of heavy earth-moving equipment. This chart is convenient for hanging on the wall and lists the characteristics, purpose, available sizes, distinguishing color and proper current for each type of electrode.

Littleford Bros., Inc., Cincinnati, Ohio—The company has released a folder on highway asphalt equipment. This bulletin, printed in blue and white, shows Model No. 155, Trail-O-Roller and Model No. 101, Utility Spray Tank. Their Kettle and Emulsion Sprayers are also illustrated.

Evans Products Co., Detroit, Mich.—"Evans Thermo-Control Fan" is the name of the informative 15-page booklet sent out by this company. It is based on questions and answers received from the field about this product. There is a cross sectional view of the fan and several clever illustrations are added for interest.

Blaw-Knox Co., Pittsburgh, Pa.—This company has released a dramatic, 32-page booklet entitled, "Blaw-Knox Functional Spring Hangers and Vibration Eliminators." This is a very handsome catalog, which is printed in black, blue and silver. There are many details concerning standard and special types and sizes of functional spring hangers and vibration eliminators, with instructions for their installation, and a good deal of engineering information.

Barnes Manufacturing Co., Mansfield, Ohio — An attractive, yellow and black booklet has been published to commemo-

OPPORTUNITY SECTION
(continued)

rate Barnes Manufacturing Co.'s Golden Jubilee. There are many illustrations of contractors' pumping units, hand and power pumps and bronze plumbing fixtures. The growth of the company is described interestingly and its wartime achievements are told.

Diesel Engine Manufacturers Assoc., Chicago, Ill.—This is a booklet showing the extent to which Diesel locomotives are replacing steam locomotives on United States railroads. It is entitled "Diesel Locomotives" and is largely descriptive although there are several impressive photographs of the new models. This pamphlet also points out that Diesel engines provide power for cranes which handle timbers, gravel, cinders and ties. Rock crushers and tractors are now frequently Diesel-powered as well.

Cannon Electric Development Co., Los Angeles, Calif.—A new revised edition of the Cannon Electric Type "K" Bulletin on electric connectors is now ready for distribution. This new edition contains 64 pages of valuable information on "K" and "RK" plugs, receptacles, dust caps, junction shells, stowage receptacles for aircraft, instruments, radio, motors, geophysical equipment, and general electrical applications. The bulletin contains many photographs, production illustrations, orthographic dimensional sketches and application pictures, in addition to the data on the various styles of "K" connectors.

Caterpillar Tractor Co., Peoria, Ill.—"Today It's Tracks and Rubber" is the title of a new 12-page booklet published recently by this company. It outlines the three zones of earthmoving: Zone 1 or power area; Zone 2 or slow speed hauling area, and Zone 3 or high speed hauling area. This bulletin tells why a rubber-tired tractor or a track-type tractor is more efficient in certain zones. There are many photographs of the units in action illustrating the advantages of each. Request Form 8995.

Timber Engineering Co., Washington, D. C.—This 17-page booklet entitled "Teco Timber Connectors in Railroad Service" discusses in separate chapters the Teco split ring, spike grid, clamping plate, shear plate, toothed ring and claw plate. Railroad structural engineers should especially find this publication helpful since it stresses the use of the products for railroad overpasses, trestles, bridges, water tank towers and railroad buildings. There are also a number of photographs showing the use of the plates and rings.

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