WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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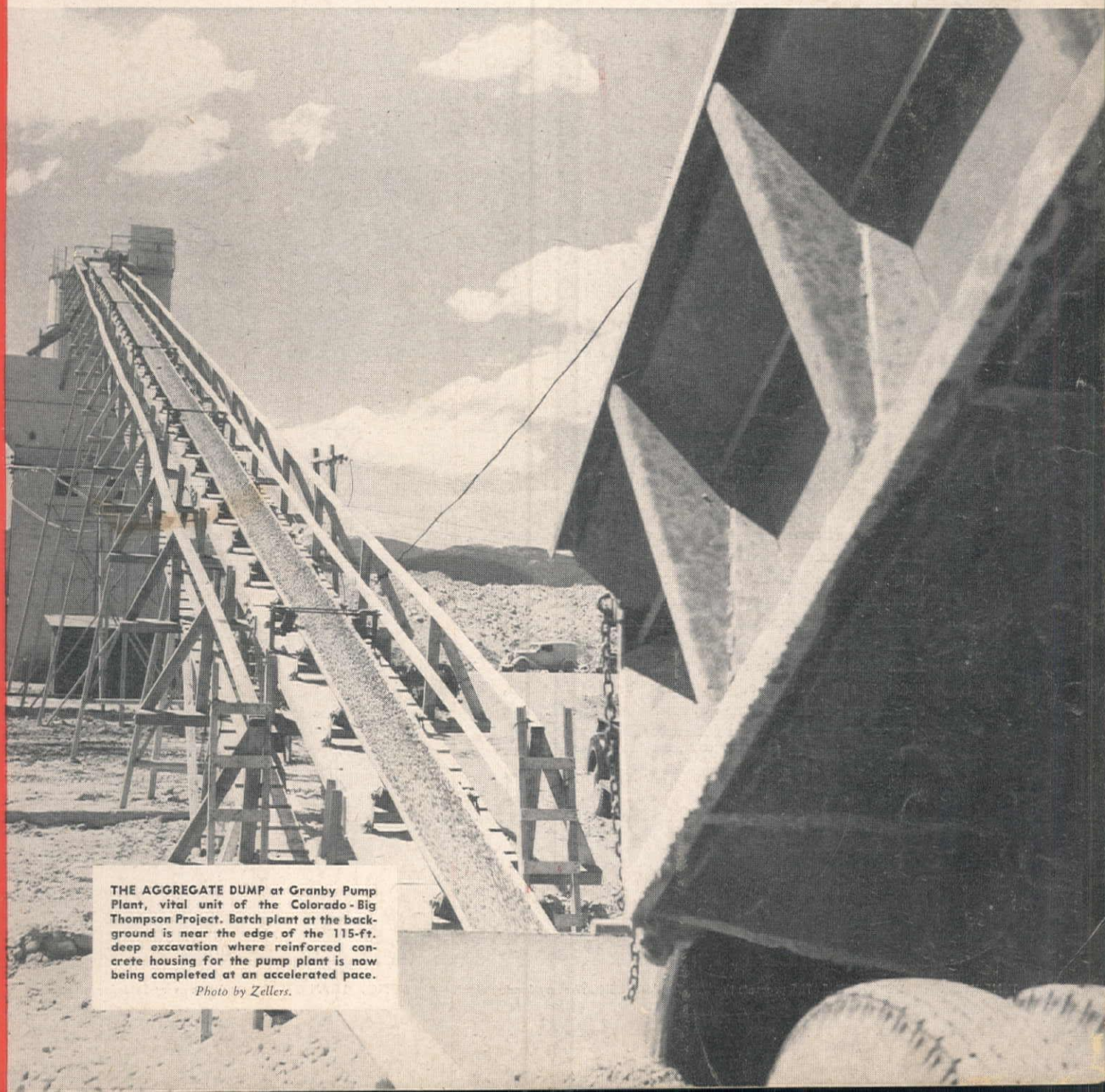


THE AGGREGATE DUMP at Granby Pump Plant, vital unit of the Colorado-Big Thompson Project. Batch plant at the background is near the edge of the 115-ft. deep excavation where reinforced concrete housing for the pump plant is now being completed at an accelerated pace.

Photo by Zellers.

DAY-AND-NIGHT WORK PROVES

"EFFECTIVE LUBRICATION" REDUCES MAINTENANCE COSTS

WHEN machines must run on round-the-clock schedules, that's when you need "effective lubrication" — the ability of your lubricant to *stay in the bearings* despite heavy loads and rough service . . . to give extra long hours of protection. And for that, nothing beats *Texaco Marfak!*

Marfak is tops for bearings in truck chassis, tractors, bulldozers, shovels and other equipment — a tough, tireless lubricant that gives *longer lasting* protection because it prevents rust and seals out dirt and moisture. Saves you money on maintenance costs.

In wheel bearings, *Marfak Heavy Duty* forms a fluid lubricating film inside, retains its original consistency at the outer edges . . . thus sealing itself in, sealing out contaminants . . . assuring longer lasting protection with no need for seasonal change.

For engines — heavy-duty gasoline and Diesel — *Texaco Ursa Oil X★★* assures top efficiency and economy. *Ursa Oil X★★* is fully detergent . . . dispersive . . . highly resistant to oxidation. It keeps engines clean.

Save time and money by using the Texaco Simplified Lubrication Plan. For full details, call the nearest of the more than 2500 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

MAKE THIS SIMPLE TEST: Put a little *Marfak* in the palm of your hand. Rub it with a circular motion and notice how it liquefies to a fine oiliness under friction while retaining its original tough consistency in the surrounding "collar." Just so, in a bearing, *Marfak* lubricates wearing surfaces, while its "collar" seals out destructive dirt and moisture, assuring longer bearing life.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

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

SUCCESSFUL CONTRACTORS

. . . keep successful with good equipment!

PLAN ahead to have these Shovel, Crane and Dragline ADVANTAGES

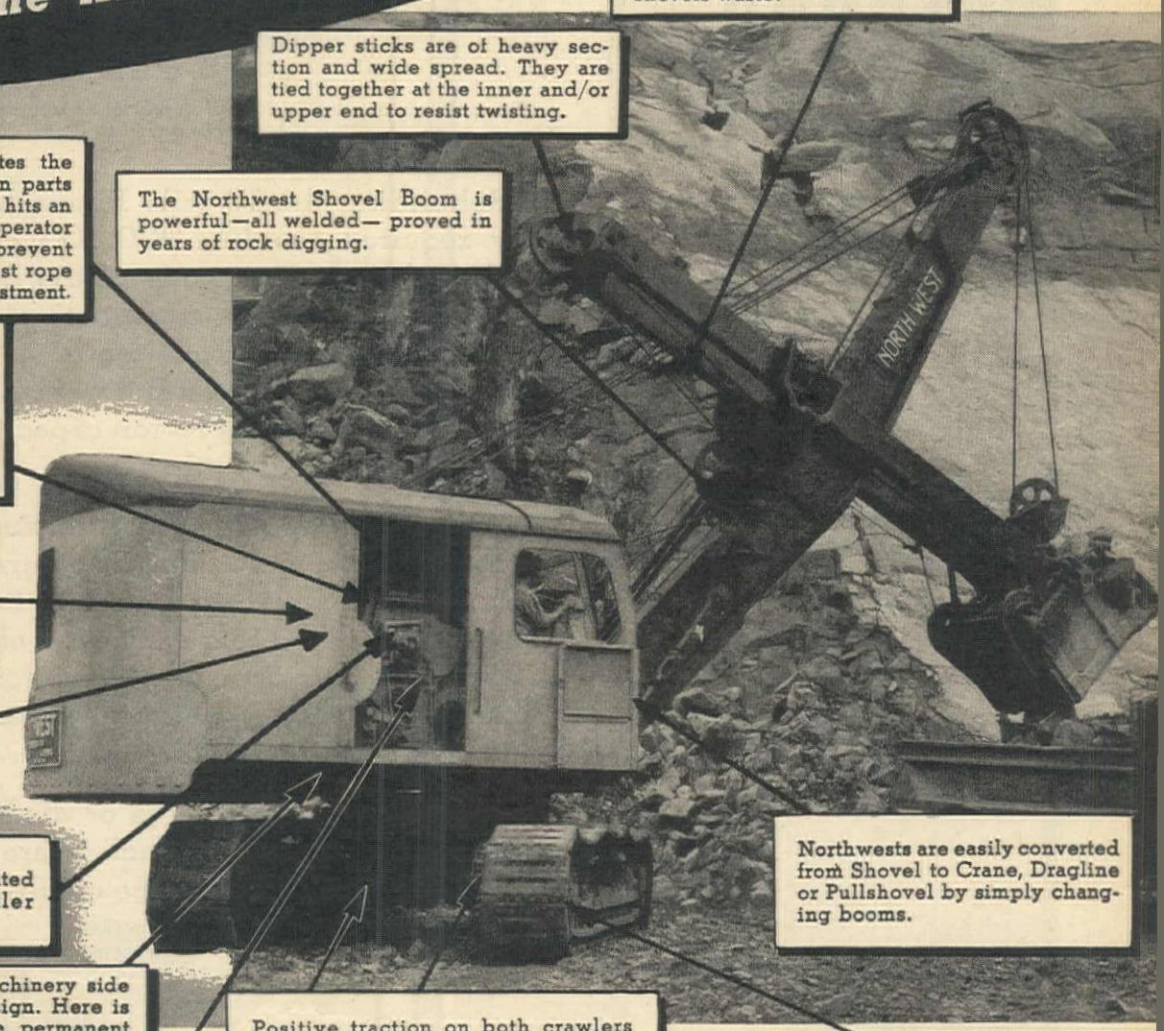
The Dual Independent Crowd — Independent plus Automatic — utilizes force other shovels waste.

Dipper sticks are of heavy section and wide spread. They are tied together at the inner and/or upper end to resist twisting.

The Cushion Clutch eliminates the effects of shock overloads on parts under power when the dipper hits an immovable rock, gives the operator time to throw out the clutch to prevent engine stalling, lengthens hoist rope life and reduces clutch adjustment.

The Northwest Shovel Boom is powerful—all welded— proved in years of rock digging.

The "Feather-Touch" Clutch Control reduces day-end fatigue and increases output. The operator always has the feel of the load, release is positive and there is no danger of shutdown because of control failure.



Uniform Pressure Swing Clutches take the grabs and jerks out of swinging, assure cooler running, increased life and reduced adjustments.

Power take-off is through helical cut gears mounted on ball or roller bearings, and running in oil. There is no finer speed reducer.

All high-speed shafts are mounted on self-aligning ball or roller bearings.

Northwests are easily converted from Shovel to Crane, Dragline or Pullshovel by simply changing booms.

Cast steel bases with cast steel machinery side frames are typical of Northwest design. Here is the strength and rigidity to assure permanent shaft alignment and reduce wear in bearings and gears.

Positive traction on both crawlers while turning as well as when going straight ahead on all machines over 1 yd. capacity assure power on both crawlers at all times. Northwests can travel where other machines have difficulty.

Alternate lugs on crawler shoes assure a self-cleaning action not found in the ordinary crawler.

Simplicity of design — few gears — few shafts — easy accessability — assure low maintenance costs.

Travel gears are fully enclosed and run in oil. There is ample clearance beneath the gear housing.

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135 South La Salle Street,
Chicago 3, Illinois

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EUCLIDS Speed Tough Highway Job

IN WEST VIRGINIA FOR VECELLIO and GROGAN

Rugged construction of Rear-Dump Euclids withstands the impact of loading heavy excavation by large shovels.

● Rebuilding the 10 mile Pineville-Welch highway required moving 900,000 cubic yards of earth and rock. From one of the deepest cuts in West Virginia road construction, 185 feet in depth, more than a quarter of a million cubic yards of heavy excavation were hauled for fill. Rear-Dump Euclids of 15-ton capacity were loaded by 1½ to 2½ cubic yard shovels.

Vecellio and Grogan used five Euclids to move most of the excavation on this contract. Because of their simple but rugged design the Rear-Dump Euclids delivered big yardages efficiently day-after-day. This dependable performance, combined with ample power and speed, cut hauling costs and kept the job on schedule.

Your Euclid representative or distributor will be glad to show you how Euclids are built for low cost hauling on a wide range of jobs.

Because of the high dumping angle and distance of the chute from the rear wheels, the load is dumped over the bank.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

EUCLIDS *Move the Earth*

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

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WESTERN CONSTRUCTION NEWS

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Volume 22 NOVEMBER • 1947 Number 11

TABLE OF CONTENTS

Covering the Western Half of the National Construction Field

It's Flame Cleaning

the fast, economical method for Preparing Steel for Painting

Start of flame-cleaning operation on water tower structure

BEFORE — *Close-up view shows conditions of paint-lift heavy rust and scale that were met.*

AFTER — *The finished job after flame cleaning. A smooth, clean, dry surface ready for a lasting coat of paint.*

QUICKLY, easily and safely applied, the Airco flame cleaning process provides a clean, warm and dry surface conducive to a lasting paint job. The oxyacetylene flame cockles old paint, loosens rust and drives off hidden moisture . . . gives longer paint life to all kinds of steel structures.

In planning new steel structures exposed to weather, prepare before you paint for economical maintenance. Flame clean all steel parts before applying the prime coat of protection. This method loosens the semi-tenacious mill scale. No dirt or moisture left to start corrosion. Reduces future maintenance costs to absolute minimum and gives longer life to the paint job.

For further details write for folder ADG-1066B—"Flame Cleaning and Dehydrating Old Steel Structures," and folder ADG-1067A—"Flame Cleaning and Dehydrating New Steel Structures." Address: Air Reduction, General Offices: 60 East 42nd Street, New York 17, N.Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. Represented Internationally by Airco Export Corporation.

ADVANTAGES OF OXYACETYLENE FLAME CLEANING

1. Provides a clean, warm and dry surface conducive to a lasting paint job.

2. Easily used inside the shop or in the field because of the extreme portability of the apparatus.

3. No special technical skill required.

4. Saves time and money in steel structure preparation.

AIRCO **AIR REDUCTION**

Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

AIR REDUCTION WCN
60 East 42nd Street, New York 17, N. Y.
Please send me a copy of folder checked.
☐ *ADG-1066B—"Flame Cleaning and Dehydrating Old Steel Structures"*
☐ *ADG-1067A—"Flame Cleaning and Dehydrating New Steel Structures"*
Name_____
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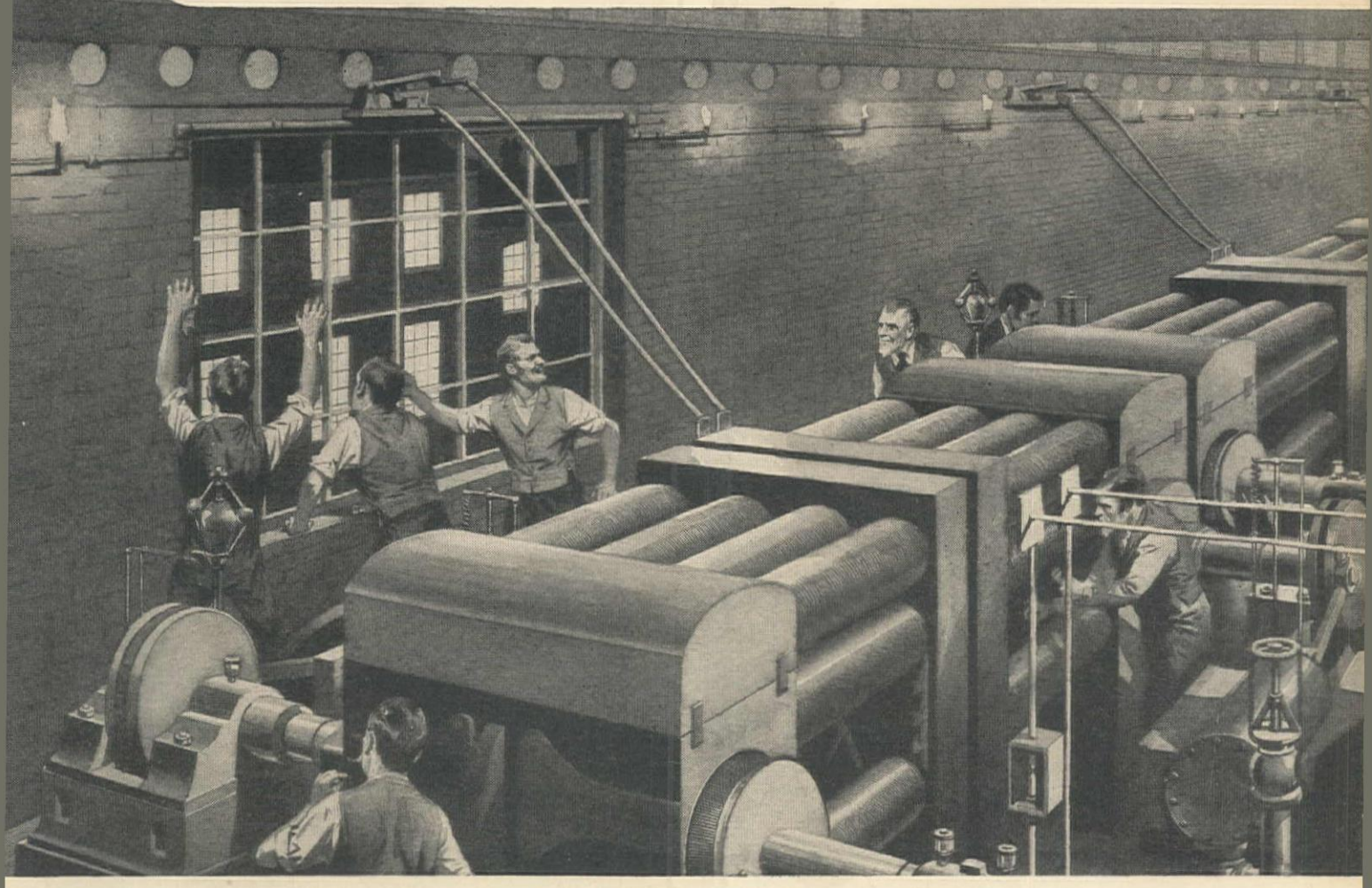
City_____ Zone_____ State_____

CONFIDENCE... how much is it worth?



IN 1880, when electric lights first were tried on New York's Broadway, Roebling's confidence in the future of electricity motivated a new Roebling undertaking . . . the manufacture of electrical wire and cable.

Roebling's contribution to this great industry during the past sixty-seven years is a matter of record. Its leadership was attained and is being maintained by rigid high standards of quality . . . tireless development of superior products, better processes, and more efficient methods.

Your confidence in Roebling is valued by every Roebling employee. His income depends upon his ability to preserve that confidence. Every Roebling employee knows that you will continue to prefer the output of his hands only if he produces better products and gives you better service. Your confidence in Roebling is Roebling's best salesman.

This applies, not only to electrical wire and cable, but to all Roebling products.

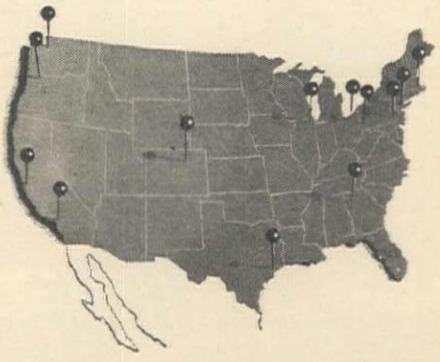
WIRE ROPE . . . ONE OF THE FIRST

Wire rope, the first product manufactured by Roebling, plays an important part in every industry. Its economical use depends upon its proper application, and hundreds of men in your industry have found a cooperative and helpful friend to lend a hand when they were puzzled with wire rope problems. He is their Roebling Field Man.

They find that he really knows wire rope and its applications, yet never hesitates to call on the Roebling Engineers and the Roebling Development and Testing Laboratory.

We, here in Trenton, are constantly being reminded by grateful customers of the ability and integrity of their Roebling Field Man . . . of his honest and successful efforts to prove that the words "Confidence" and "Roebling" are one and the same.

At the right is a listing through which your nearest Roebling Field Man can be contacted. Why not call or write him today? Make an appointment to meet a friend who can save you both time and money on your wire rope installations.



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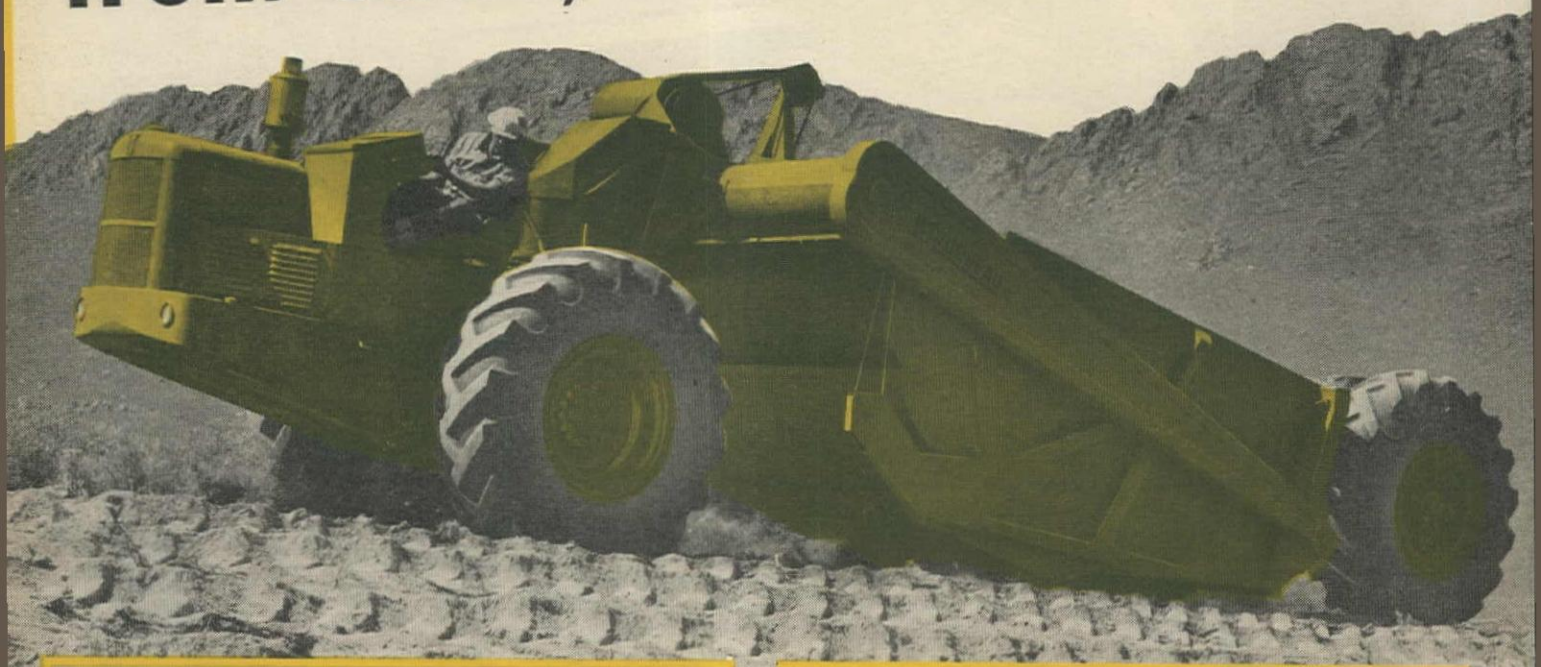
ROEBLING

A CENTURY OF CONFIDENCE

Here's why new high-speed TOURNAPULLS cut delays from sand, mud and weather



Deep Mud — Positive power steer and Tournamatic differential enable this Tournapull to "walk" through deep mud. With Tournamatic differential, the power flow is to the wheel on firmest footing . . . the drive wheel with the most traction does the work.

Sticky Clay — Tournamatic constant mesh transmission and giant rubber tires, coupled with positive steer and revolutionary Tournamatic differential provide a combination that enable Tournapull to haul through material that would stop any ordinary earthmover.

LETOURNEAU LET EQUIPMENT

See your Le Tourneau Distributor NOW for complete information

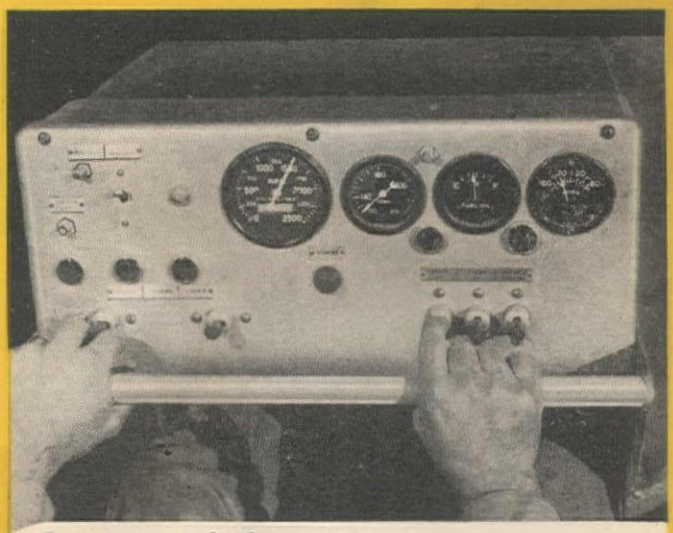
TOURNAPULLS "walk" through deep mud, soft sand, sticky clay . . . haul fast over surface slippery with ice or snow . . . without delays. These *four* exclusive features keep Tournapulls working longer in adverse weather and tough job conditions.

1 EXTRA FLOTATION AND TRACTION — giant rubber tires provide plenty of surface contact . . . tapered bead permits extra low pressures for additional flotation, keeps tire firmly seated against rim. Heavy-duty, specially designed tread grips the ground . . . rugged construction resists the wear and tear of tough going.

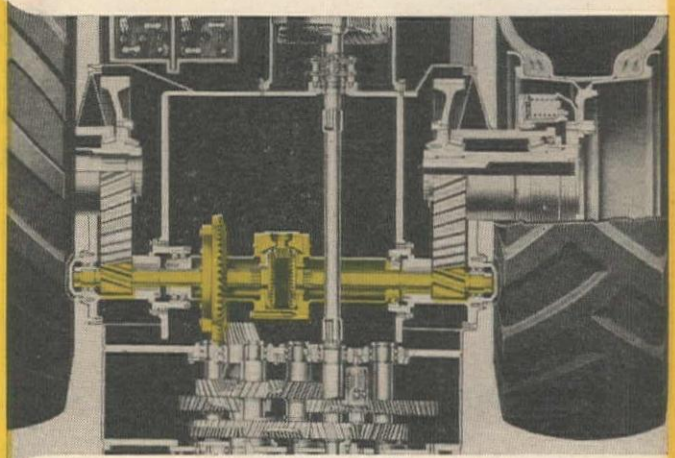
2 INSTANTANEOUS SPEED SELECTION — constant mesh Tournamatic transmission gives uninterrupted power-flow to drive wheels. No time lost shifting . . . no loss of momentum . . . more power *instantly* to keep you out of trouble . . . a flick of the wrist gives immediate change of pace to any of four forward and two reverse speeds.

3 POWER PROPORTIONATING DIFFERENTIAL — Tournamatic differential transmits the *most* power to the wheel with the *most* traction. A Tournapull wheel doesn't spin in mud holes or in other loose or slippery materials because other wheel automatically takes over job of moving rig in desired direction. This revolutionary feature gives up to *four* times as much pull to wheel on firmest footing.

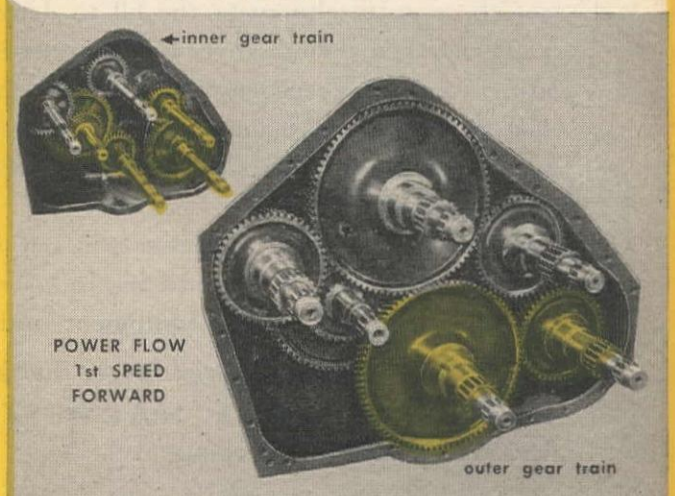
4 POSITIVE POWER STEER — Tournapull goes just where operator wants it . . . without fighting clutches, brakes, or steering wheel . . . a finger-touch switch gives and holds exactly the angle of turn required — up to 90 degrees, right or left. Powerful electric motor turns prime mover even in deep mud or sand giving fresh traction at all times to pull through in all kinds of weather.



Finger-touch Control — The movement of a finger on a switch controls every phase of the load, haul and spread cycle. Powerful Tournatorque electric motors steer the Tournapull, control the depth of cut, activate the positive ejection tailgate.



Tournamatic Differential — This differential controls the amount of power delivered to each drive wheel, prevents wheel spinning if traction is lost. If one drive wheel loses traction, up to *four* times as much power is automatically transferred to the other wheel.



Tournamatic Transmission — Constant mesh transmission saves time and energy. There is no time wasted shifting up and down gears . . . no foot clutch to bother with . . . no loss of momentum in tough going. A flick of the wrist gives the desired speed *right now.*

LETOURNEAU
PEORIA, ILLINOIS

HIGH-SPEED RUBBER-TIRED

TOURNAPULLS

EARTH moving problems turn into jobs that pay plenty of profits when International Diesels power the work!

More and more contractors are finding this out. They see how International Crawlers lug through heavy going to boil up capacity loads in their scrapers. And when the blades are up they see these outfits hurry to the fill to deliver big hourly yardage.

Then, when they discover how International's unbeatable operating economy keeps costs down, they know that here's *power that pays*. The low maintenance and fuel requirements of International Diesel Crawlers makes successful bidding and profitable results assured.

For facts about the benefits you get in these power-packed tractors, visit your International Industrial Power Distributor. Let him help you select equipment and the *power that pays*.

Industrial Power Division

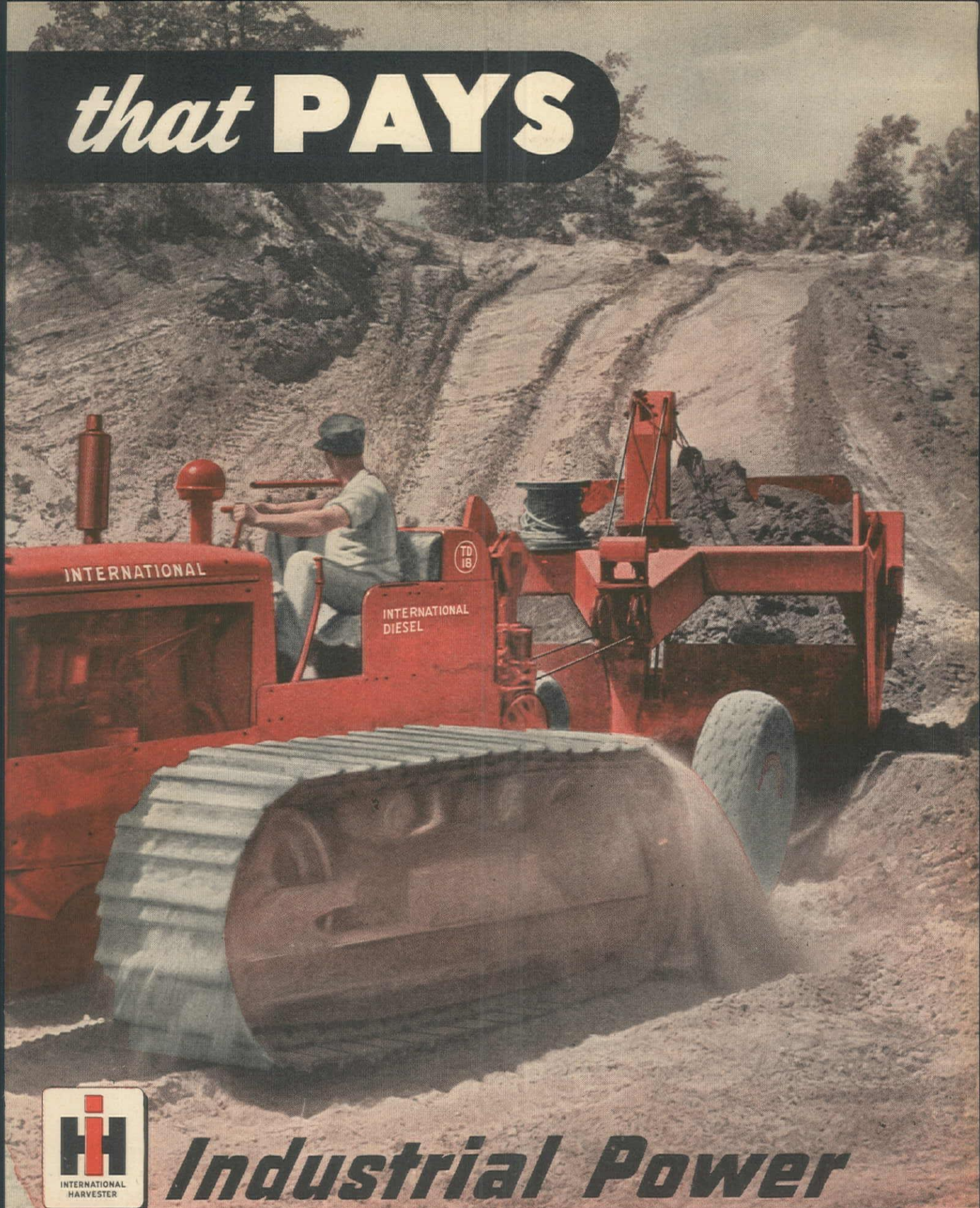
INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue **Chicago 1, Illinois**

CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

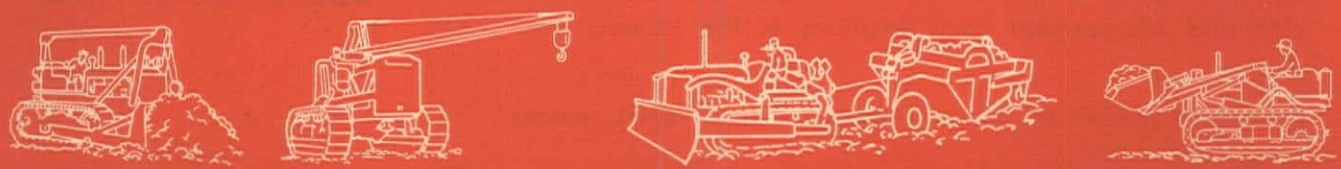
INTERNATIONAL

that PAYS

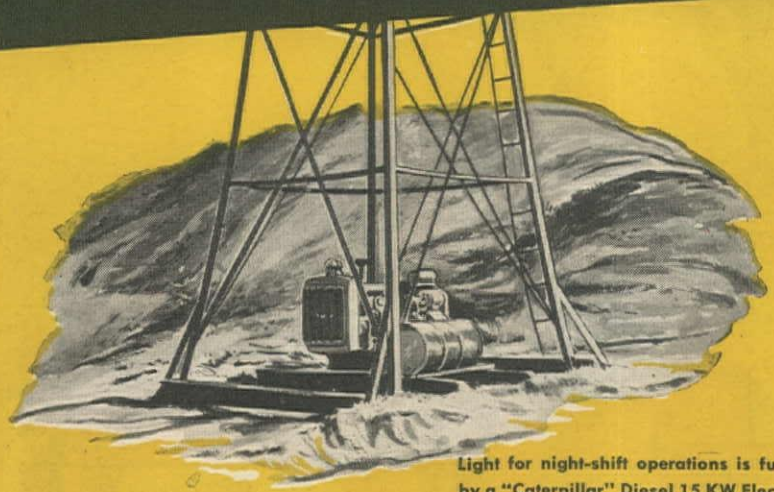


INTERNATIONAL HARVESTER

Industrial Power



"CATERPILLAR" DIESELS TACKLE



Light for night-shift operations is furnished by a "Caterpillar" Diesel 15 KW Electric Set.

If there's any tougher earthmoving show on record than the Potholes Dam project, the contractors, Lytle, Amis, Green Co., haven't run across it.

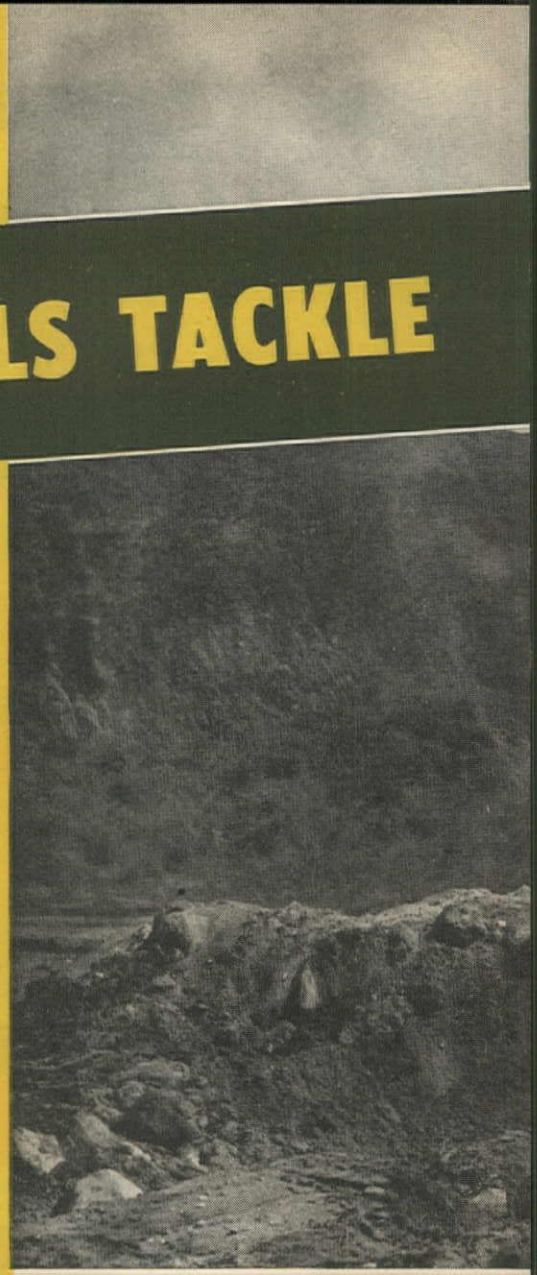
To build this giant earth-fill dam in the Big Bend country of Washington, 11 million yards must be moved. And practically every yard of it is the hardest kind of rock and boulder formation. That's why the natural choice of equipment is "Caterpillar."

Already at work are fleets of "Caterpillar" Diesel D8 Tractors with "Caterpillar" No. 8S Bulldozers; "Caterpillar" Diesel No. 12 Motor Graders; "Caterpillar" Diesel DW10 wheel-type Tractors—and shovels, compressors and lighting units, all "Caterpillar" Diesel powered.

Eventually this will be a typical "Caterpillar" *Zoned Equipment* job, with D8s and D7s doing the bulldozing and short hauling, while fast DW10s, rolling on rubber, will make time on the longer hauls.

"Caterpillar" Diesels are built to stand up under the terrific punishment of this type of work and turn out big production month after month. Back of their long life and economical performance are the prompt, efficient service and replacement parts facilities of the "Caterpillar" dealer.

CATERPILLAR TRACTOR CO., SAN LEANDRO, CALIFORNIA; PEORIA, ILLINOIS

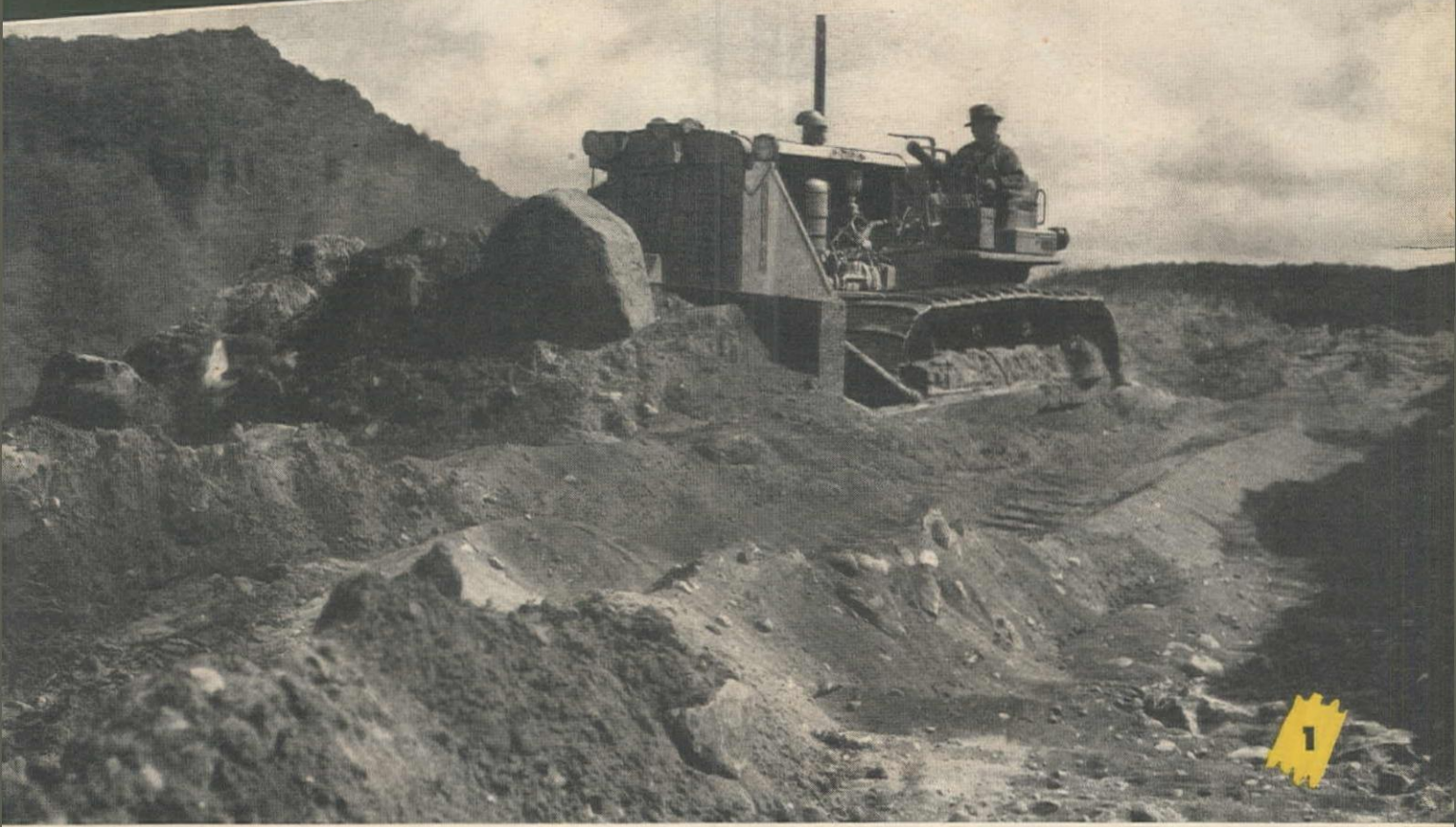


1 A "Caterpillar" Diesel D8 Tractor with "Caterpillar" No. 8S Bulldozer handles boulders on the Potholes Dam project.

2 One of the "Caterpillar" Diesel No. 12 Motor Graders used for building roads and leveling the top of the dam.

3 Pulled by a "Caterpillar" Diesel DW10 Tractor, a converted earthmoving wagon carries water to wet down the fill.

"TOUGHEST EARTHMOVING JOB"

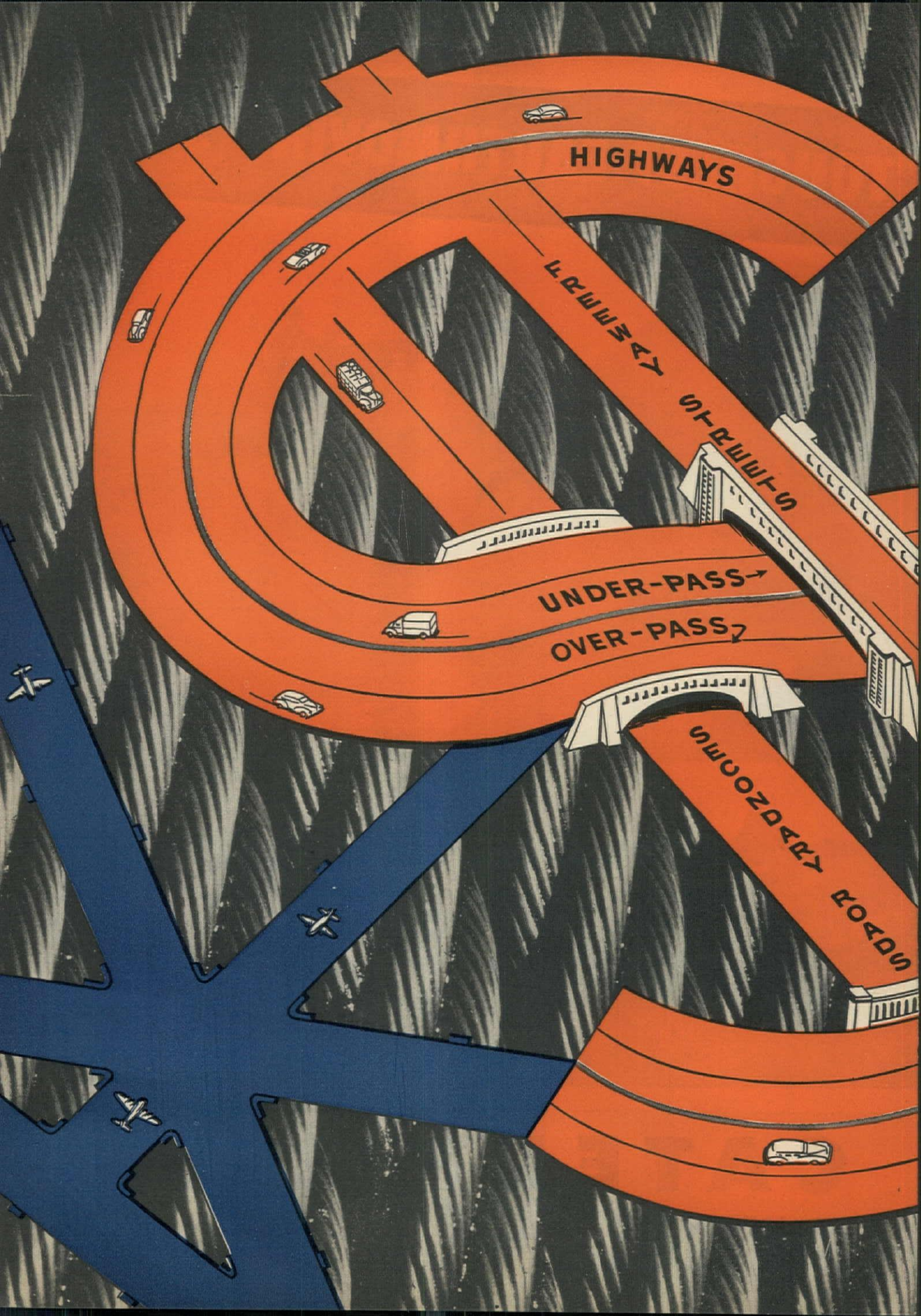


CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL

ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT


HIGHWAYS
UNDER-PASS
OVER-PASS

GOOD ROADS ARE CHEAP!

Figured on a per year instead of a per mile basis, good roads will cost nothing because they will pay off in miles, minutes and lives. Time and delay studies show that lost minutes at 1 cent per minute, per car and lost miles at 3 cents per mile, per car will more than pay the yearly cost of modern highways tailored to fit traffic flow and load. Facts from the Public Roads Administration's accurate inventory of highways and traffic indicate that—

AMERICA CANNOT AFFORD TO WAIT UNTIL THERE ARE 100 CENTS IN THE DOLLAR NOR UNTIL THERE IS UNEMPLOYMENT TO BE RELIEVED

MAKE RESERVATION NOW — VISIT WORLD'S FAIR OF CONSTRUCTION MACHINERY

The gigantic jobs of highway, airport, flood control, irrigation and soil conservation construction planned for America could not be accomplished for ten times present costs were it not for the fact that the construction equipment industry has designed, engineered and developed cost-cutting, man-hour-saving machinery far ahead of anything ever before heard of.

It will be there—at Soldier Field, Chicago, July 16-24, 1948, the Road Show — World's Fair of Construction machinery. Spectacularly and colorfully displayed in an arena the size of 30 football fields, you'll see hundreds of mechanical miracles ranging from push-button-jobs up to 200 tons in weight. No construction man can afford to miss it. Everyone in the profession will find the exact cost-cutting equipment needed to handle this responsibility in the tremendous construction projects America must start and finish with greater speed than ever before.

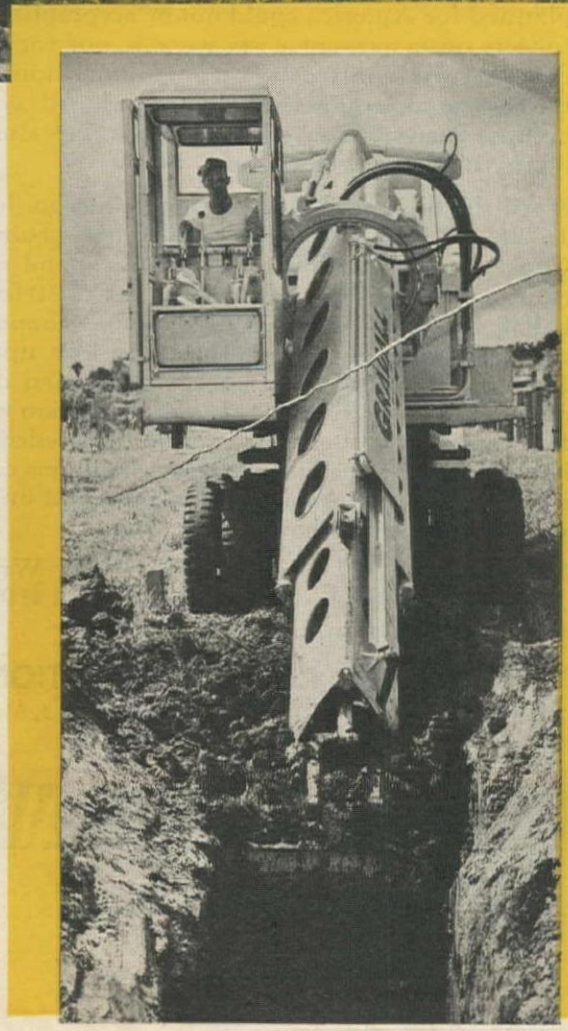
Make your hotel reservation NOW. Write American Road Builders Association, 1319 F. Street, Washington, D. C.

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

union Wire Rope
union-formed is Preformed

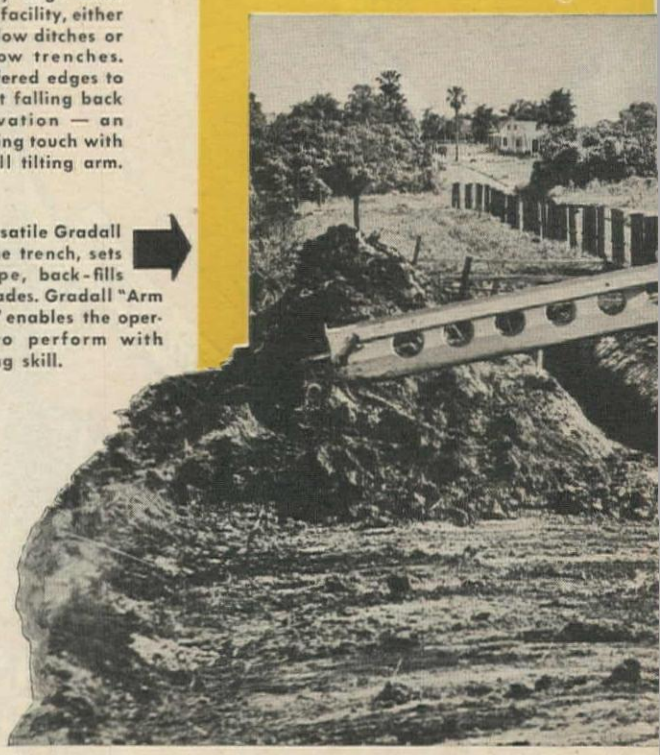
$6,245 SAVED IN 9

After taking a substantial "bite" in the trench, the City of Lakeland's Gradall quickly and easily swings to dump the dirt at a convenient spot for later back-fill.



The Gradall accurately digs with equal facility, either broad shallow ditches or deep, narrow trenches. Note chamfered edges to prevent dirt falling back into excavation — an easy, finishing touch with the Gradall tilting arm.

The versatile Gradall digs the trench, sets the pipe, back-fills and grades. Gradall "Arm Action" enables the operator to perform with amazing skill.



DAYS.. *with* GRADALL

THE CITY OF LAKELAND, FLORIDA, quickly proved that its purchase of a Gradall will save its taxpayers a lot of money. Here are the facts:

The first job for this multi-purpose construction machine was on water main extensions—digging trenches, setting pipe, back-filling and grading. *In 9 days, Gradall with a 12-man crew had completed as much work as a 30-man gang had done in six weeks.* Cost figures showed a saving to the municipality of $6,245 in the first 9 days. It doesn't take long for a Gradall to pay for itself.

Gradalls are proving to be time-savers and money-makers for contractors, municipalities, and maintenance men everywhere.

Its unique "Arm Action" performs all kinds of earth handling jobs with astonishing skill and a neat precision that practically eliminates need for "clean-up" manual labor.

It travels from job to job at truck speed. It can effectively operate with low head room —reach in around trees and poles, and work in close quarters, to do jobs impossible for conventional machines.

Interchangeable tools specifically designed for different needs can be attached to the powerful hydraulic arm in less than 15 minutes. "Arm" extends 24 feet, swings full 360 degrees.

SALES AND SERVICE:

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

BAY EQUIPMENT CO.
3254 East Shore Highway
Richmond, California

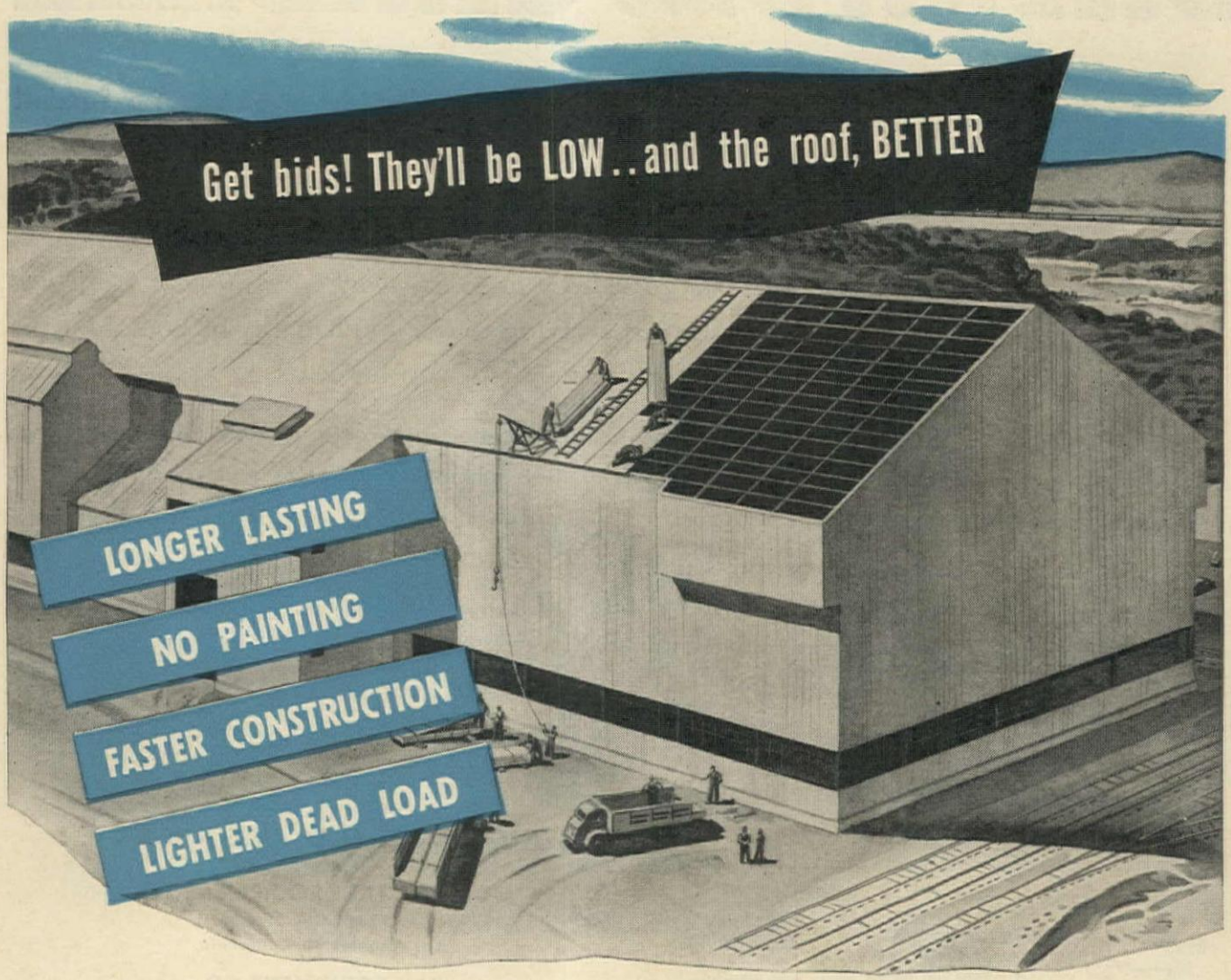
INDUSTRIAL EQUIPMENT CO.
720 South 19th Ave., P. O. Box 2669
Phoenix, Arizona

For demonstration see the nearest Gradall distributor—or write Warner & Swasey Company, Cleveland, Ohio, for full information.

GRADALL
DIVISION
WARNER & SWASEY
Cleveland

Gradall Reg. U. S. Pat. Off.

Alcoa Aluminum INDUSTRIAL



Aluminum, a topflight roofing material that has been used on monumental buildings for many years, is now economical for industrial applications. Alcoa Industrial Roofing and Siding is made of a tough Alcoa Alloy that is unexcelled in resistance to atmospheric corrosion by any aluminum alloy now made. It is easy and inexpensive to put on . . . attractive in appearance.

Alcoa Industrial Roofing and Siding gives you, and your clients, that almost unbelievable combination . . . a *better* material at *lower* price. A material that will withstand common industrial atmospheres . . . smoke and fume . . . for years on end. A material that won't rust, streak or stain.

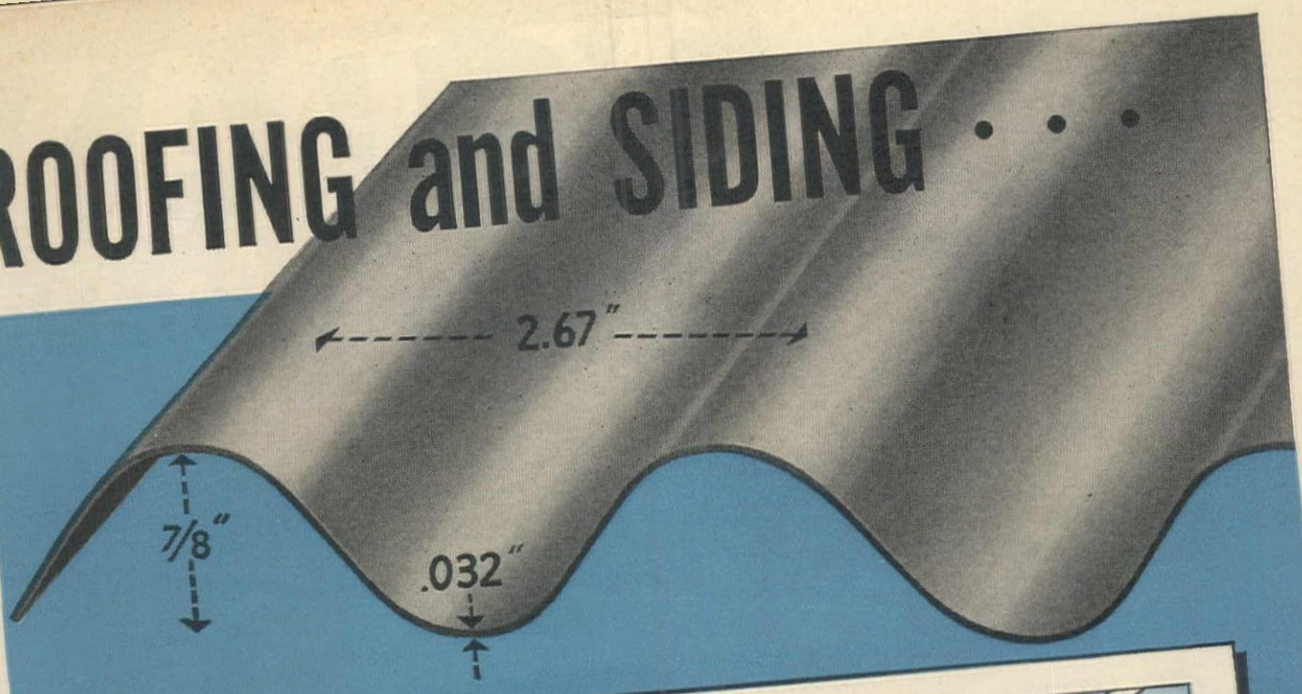
Figure it in aluminum, any job on your boards that can use sheet roofing or siding. Calculate not only the savings but also the client satisfaction, which will be plenty.

WRITE FOR PRICES

ALCOA REG. U. S. PAT. OFF. ALUMINUM

ALCOA

ROOFING and SIDING . . .



HERE ARE THE DETAILS

Thickness: .032 inches.

Lengths: 5, 6, 7, 8, 9, 10, 11 and 12 feet.

Widths: Roofing sheet, 35 inches; Siding sheet, 33¾ inches; Coverage: 32 inches.

Corrugation: ⅞ inch deep. 2.67 inches crown to crown.

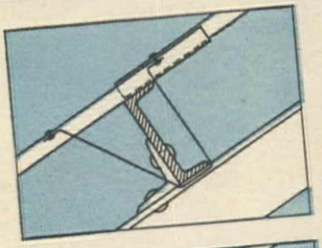
Weight: 56 lbs. per 100 sq. ft.

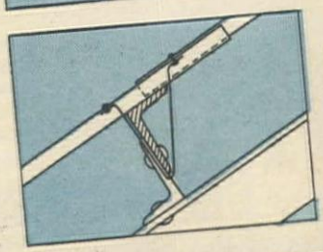
LOAD CARRYING CAPACITY

PURLIN SPACING	CLEAR SPAN	UNIFORM LOAD p. s. f. (Safety factor: 2)
6'6"	76"	29
6'0"	70"	35
5'6"	64"	41
5'0"	58"	50
4'6"	52"	63
4'0"	46"	80

QUICK APPLICATION

Illustrated here are two of the many ways of installing Alcoa Industrial Roofing Sheet.



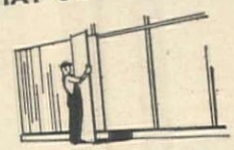


STRAP FASTENERS CAN BE ADAPTED TO PRACTICALLY ANY TYPE OR ARRANGEMENT OF PURLINS.

WITHSTANDS INDUSTRIAL SMOKE AND FUME

Alcoa Aluminum has been used for many years on coal mines, railroad terminals, warehouses, factory buildings and locomotive roundhouses. The protective qualities of Alcoa Roofing and Siding have been virtually unaffected by these severe conditions.

FOR SIDING THAT GOES UP FAST



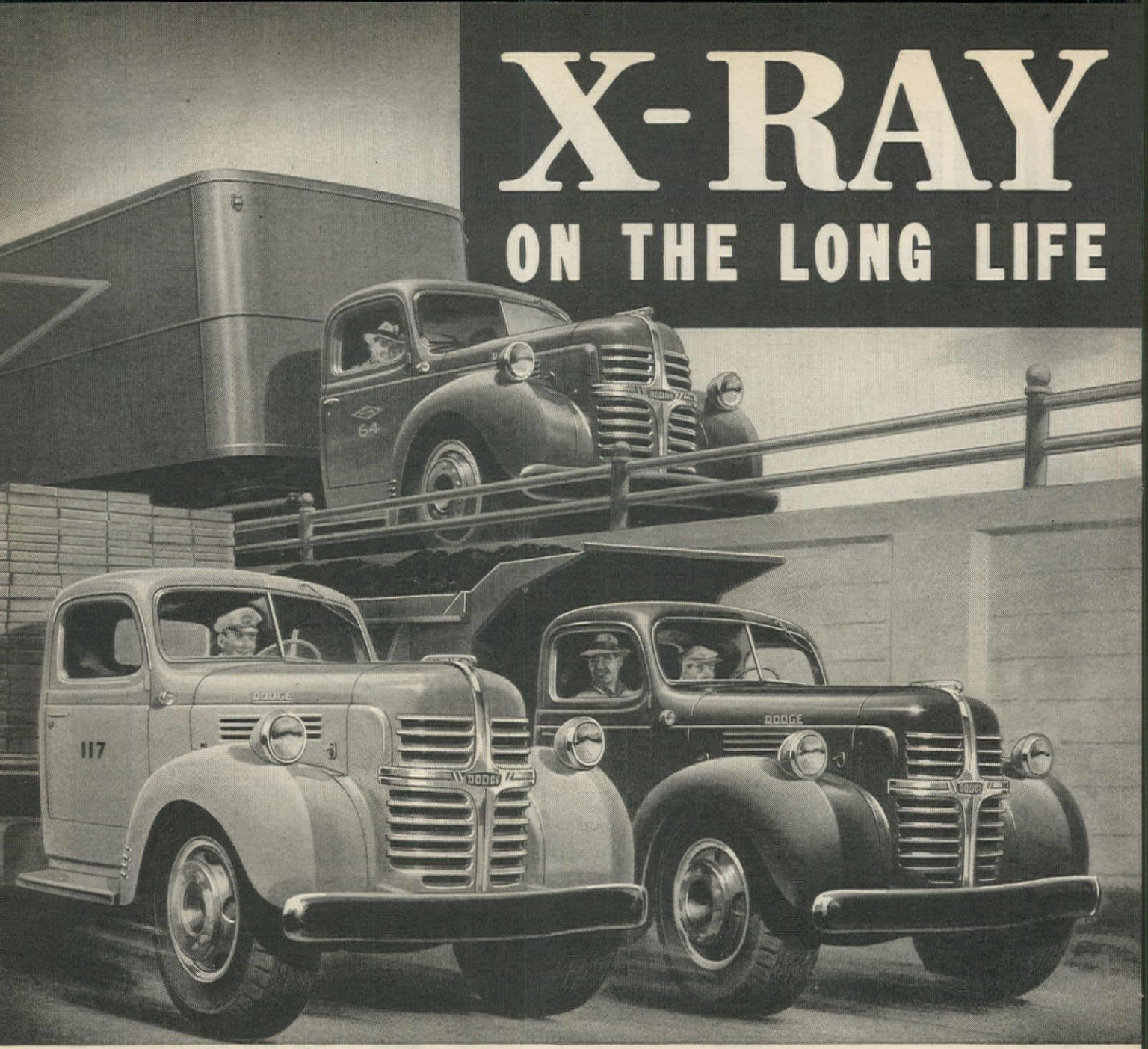
Alcoa Industrial Siding has the same corrugation dimensions and lengths as Industrial Roofing. Over-all width is 33¾ inches covering 32 inches and providing extra economy for siding applications. Properly applied and with girt spacings up to 7'9" it will withstand 20 p.s.f. wind load.

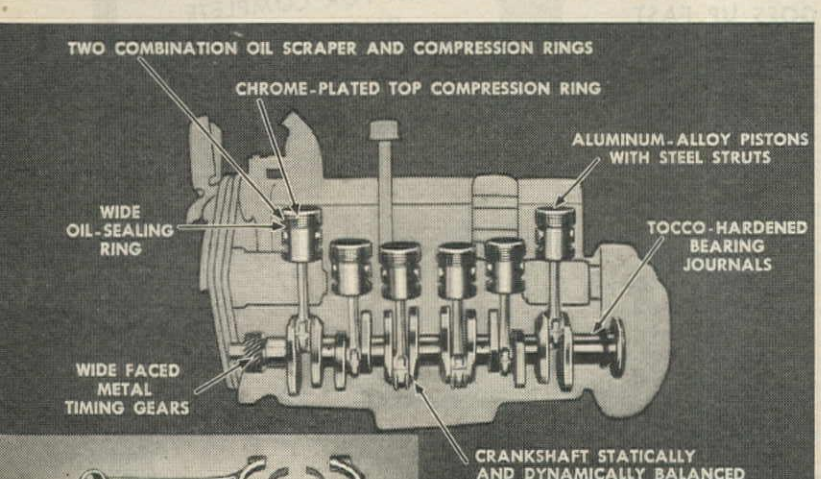
ASK FOR COMPLETE INFORMATION

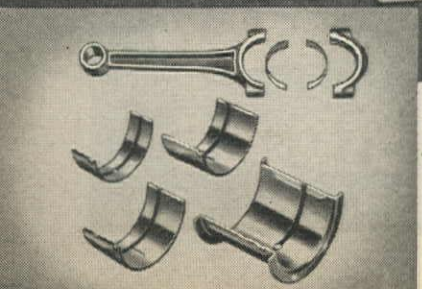
Pick up your telephone now and call your local Alcoa sales office. Ask for a sample and complete information on Alcoa Industrial Roofing and Siding Sheet. Or write to ALUMINUM COMPANY OF AMERICA, 1449 Gulf Bldg., Pittsburgh 19, Pa.

INDUSTRIAL ROOFING AND SIDING

X-RAY ON THE LONG LIFE

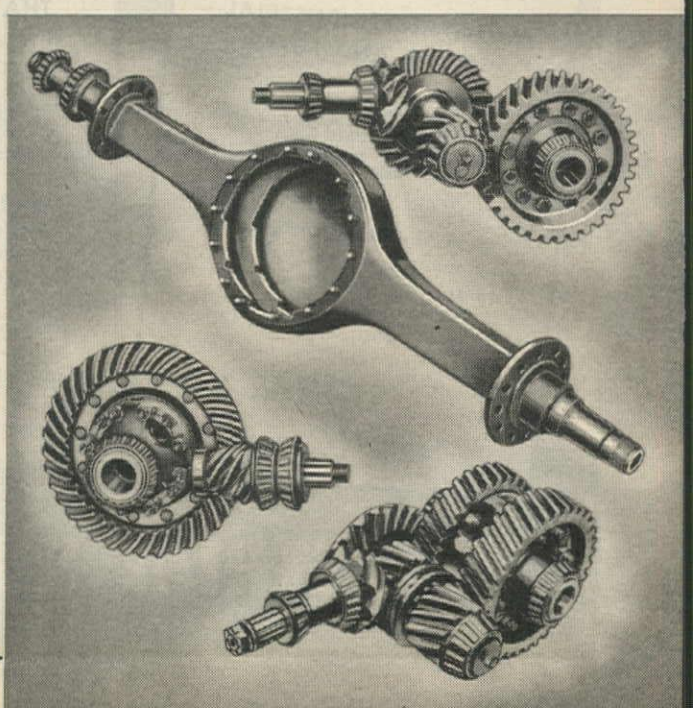






7-bearing crankshaft, with Tocco-hardened journals. Aluminum alloy pistons with four rings. Replaceable multiple-layer bearings.

Rugged, dependable rear axles—single-speed; single-speed, double-reduction, and 2-speed, double-reduction fit every hauling need.



EVIDENCE

AND ECONOMY OF

DODGE "Job-Rated" HEAVY DUTY TRUCKS

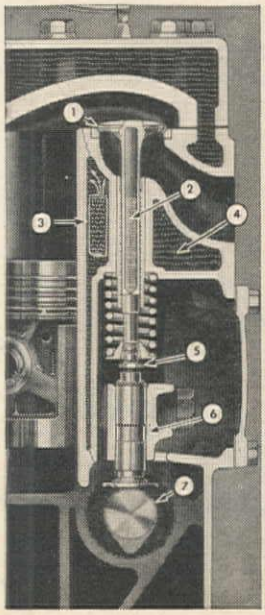
FROM radiator to rear axle, these heavy-duty trucks were especially engineered and built for *long, economical* service.

They're powered by two brilliant *truck* engines, of 282 and 331 cubic inch displacement. Horsepower-to-weight ratios reach a new high! These engines develop 225 and 270 pound-feet of torque respectively—and maintain high torque output over a wide speed range.

Engine cylinder walls, of chrome nickel molybdenum alloy cast iron, are *so hard* that wear is almost non-existent. Valves are made of silchrome, a special valve material of exceptional durability. For long life, exhaust valves are sodium-cooled; valves and valve seat inserts are stellite-faced.

Everywhere, unnecessary surplus weight is eliminated by improved design and advanced metallurgy. New and strictly *heavy-duty* clutches, and a remarkably efficient five-speed transmission—coupled with rear axles of entirely new design—provide a highly efficient transmission of driving torque to the wheels. Despite their husky construction and rugged strength—these trucks handle with ease, even on steep grades with capacity loads.

If *your* transportation requirements fall within the 18,500 to 23,000-pound gross vehicle weight ranges (up to 40,000 pounds G.T.W.) . . . get the complete story of these great new Dodge *"Job-Rated"* heavy-duty trucks from your Dodge dealer. We believe you'll find them your long-awaited answer to *lower-cost hauling* in their capacity ranges!



1 Stellite-faced exhaust valves and seat inserts. (All valves and valve seat inserts are of hard, durable silchrome.)

2 Sodium-cooled exhaust valves.

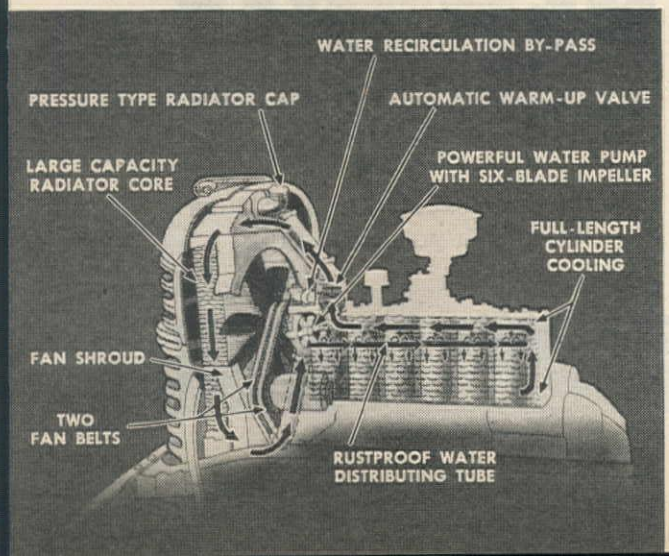
3 Rustproof water distributing tube for exhaust valve seat cooling.

4 Large water pockets surround valve stems for quick heat dissipation.

5 Self-locking adjusting screws facilitate tappet adjustments.

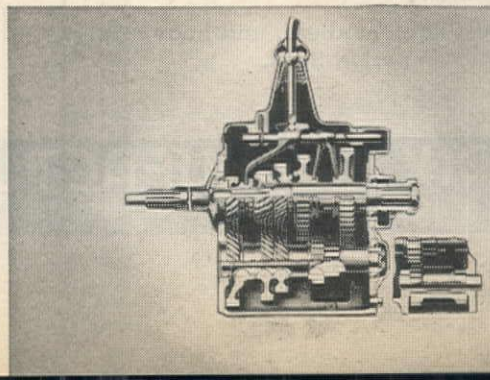
6 Tappets lubricated by pressure feed for long life.

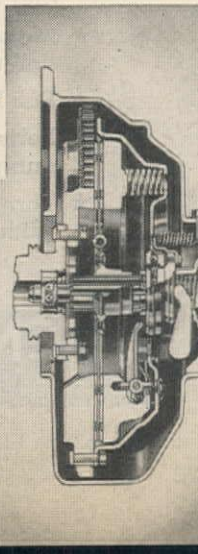
7 High-test cast iron alloy camshaft supported by four large bearings.



This highly effective cooling system is an important reason for the greater economy, dependability, and longer life of these heavy-duty trucks.

Rugged 5-speed transmissions and heavy-duty clutches, with capacity well in excess of engine torque, insure long life, low-cost maintenance.

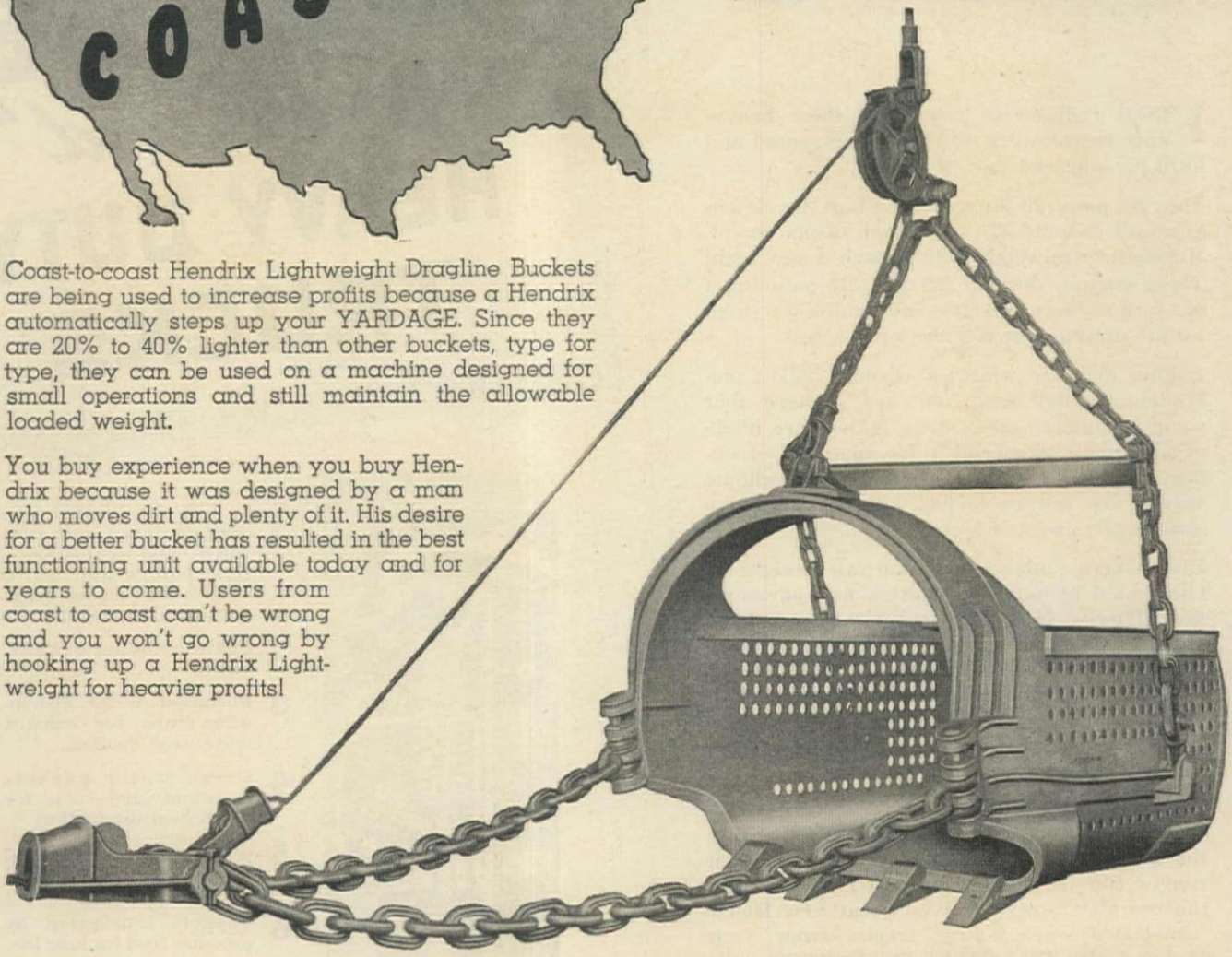




HENDRIX BUCKETS ARE MAKING PROFITS

Coast-to-coast Hendrix Lightweight Dragline Buckets are being used to increase profits because a Hendrix automatically steps up your YARDAGE. Since they are 20% to 40% lighter than other buckets, type for type, they can be used on a machine designed for small operations and still maintain the allowable loaded weight.

You buy experience when you buy Hendrix because it was designed by a man who moves dirt and plenty of it. His desire for a better bucket has resulted in the best functioning unit available today and for years to come. Users from coast to coast can't be wrong and you won't go wrong by hooking up a Hendrix Lightweight for heavier profits!



⅜ TO 40 CUBIC YARDS

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

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

Write for descriptive literature or ask your dealer

HENDRIX MANUFACTURING COMPANY
MANSFIELD INCORPORATED LOUISIANA

10 MAJOR ADVANTAGES that mean higher production and lower yardage costs

with Wooldridge TERRA-COBRAS

MEASURE EACH JOB IN TERMS OF WOOLDRIDGE EQUIPMENT:

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

★ **POWER CONTROL UNITS**
Single and multiple drum with universal or roller fairleads.

★ **BULLDOZERS**
Tough and rugged design for standard makes of tractors.

★ **TRAILBUILDERS**
Adjustable angle blades for standard tractor mounting.

★ **RIPPERS**
Available in light, medium, and heavy duty models.

Point for point Wooldridge Terra-Cobras offer you greater yardage profits. When you put Terra-Cobras on your job you gain these outstanding Wooldridge performance features.

1. FIVE years of fully tested and proved performance under all types of operating conditions.
2. The original POSITIVE *HYDRAULIC* STEERING CONTROL.
3. Flexibly articulated oscillating pivot for easier, safer travel.
4. Smooth powerful air-controlled cable hoist.
5. Individual control of blade, apron, and positive tilt forced load ejector.
6. Balanced load distribution with maximum traction and power on drive wheel centers.
7. Greater maneuverability combined with shorter turning radius.
8. Ample power, acceleration and speed fully loaded.
9. Faster loading, dumping, and spreading.
10. All parts easily accessible for service maintenance.

Buy & Rely on

WOOLDRIDGE

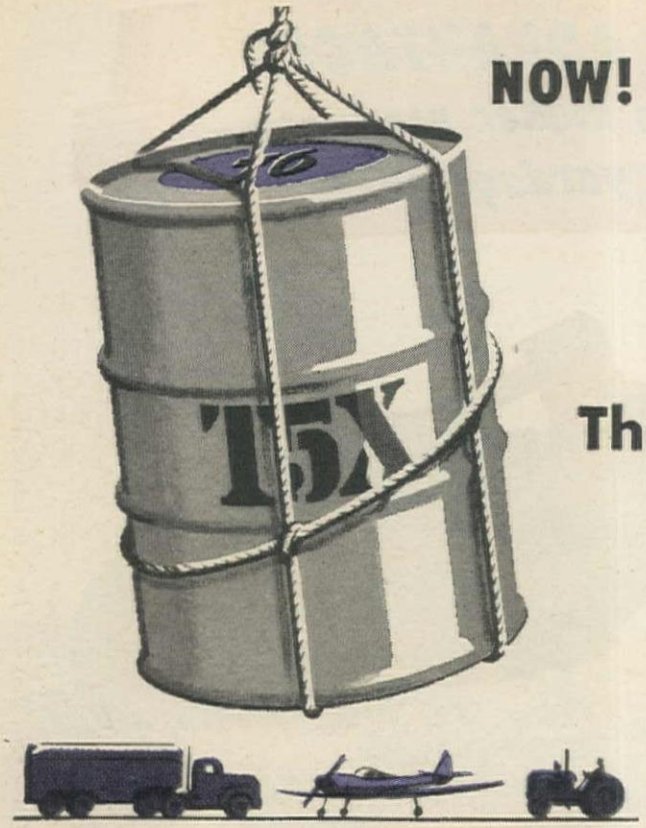
TERRA COBRA

HIGH SPEED-SELF PROPELLED

EARTHMOVERS

WOOLDRIDGE MANUFACTURING CO.
SUNNYVALE, CALIFORNIA

NATIONWIDE SERVICE



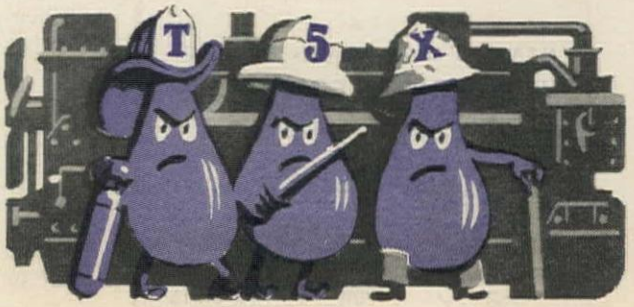
NOW! AVAILABLE IN QUANTITY!

T5X

The Royal Purple Motor Oil

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

2. T5X is so outstanding that it easily passed the grueling 500-hour continuous-run Diesel engine test—considered the most exacting test of all for Diesel lubricants! In the "L-4" Coordinating Research Council tests for gasoline engine lubricants, T5X lasted *double* the length of time required for top lubricating performance!



3. T5X keeps engines clean! It contains a new detergent compound that holds unburned fuel residues and other impurities suspended harmlessly in the oil, preventing sludge formation. Thus oil lines, pistons and ring grooves stay clean!

4. T5X reduces wear! It contains an inhibitor which minimizes oil oxidation, gives high stability against heat. Another additive protects against corrosion and rust. A third ingredient retards foaming even under the most adverse conditions.

T5X is *so high in quality, so versatile in its uses,* that it gives outstanding protection and performance in *any* internal combustion engine in *any* industrial operation. This sensational *purple* oil is now available for immediate delivery. Phone your local Union Oil Representative, or wire Sales Dept., Union Oil Company, Los Angeles 14, California, for full information.

ANOTHER **UNION OIL** SUCCESS-TESTED PRODUCT

At last! an all-material, heavy-duty car unloading team!

Cuts unloading—stockpiling time as much as 90%

EXCLUSIVE NEW ADVANTAGES!

For All Materials . . . *Crushed stone, granite chips, sand, gravel, agricultural lime, coal, road stone, coke, foundry sand, cinders, clay, chemicals, fertilizers, ores, wet concrete, etc.*

For All Users . . . *Road contractors, building supply yards, concrete products plants, foundries, quarries, railroads, ceramic plants, industrial power plants, chemical plants, etc.*

Imagine a portable car unloader and stockpiler that can clear a car of stone or rock in 45 minutes! Imagine an unloading "team" that requires only one man's time . . . that frees expensive clamshells and other equipment for more productive work . . a team rugged enough to deliver up to three tons per minute through years of service, yet economical enough to pay off on intermittent work!

That's what Barber-Greene offers you in the new 358 and 363. Now for the first time you can truly eliminate hopper-car unloading problems, no matter what bulk materials you're handling!

Send for Full Details!

Use the coupon, or write for complete data, photos and specs on the 358 and 363.

Barber-Greene Company
Aurora, Ill.

☐ Send details on the 358 and 363

☐ Have a B-G representative call

Name .....

Street .....

City ..... State .....

Barber-Greene
BARBER-GREENE COMPANY
AURORA, ILLINOIS

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

3/4 YARD UNLIMITED

Extra working range as a shovel, extra weight and stability, extra lifting capacity, particularly at the practical crane, clamshell and dragline working radii . . . three reasons why the Koehring 304 can often handle jobs beyond the range of other ¾ yard excavators. Yet, this Heavy-Duty leader in the ¾ class also gives you all the advantages that make the ¾ yard size popular. Moderate investment cost pays off on small, short jobs. Low fuel cost. Easy to transport. Maintenance is easy on the operator, because gears are enclosed, run in oil, anti-friction bearings require lubrication only twice a year.

Compare These Facts and Figures:

Shovel Working Range: (45° Boom Angle)
- Maximum Cutting Height: 22'11"
- Maximum Dumping Reach: 24'5"
- Maximum Cutting Reach: 27'3"
- Digging Depth Below Level: 6'11"

Shovel Weight: 44,300 lbs.
(Includes 1,000 lb. Counterweight)

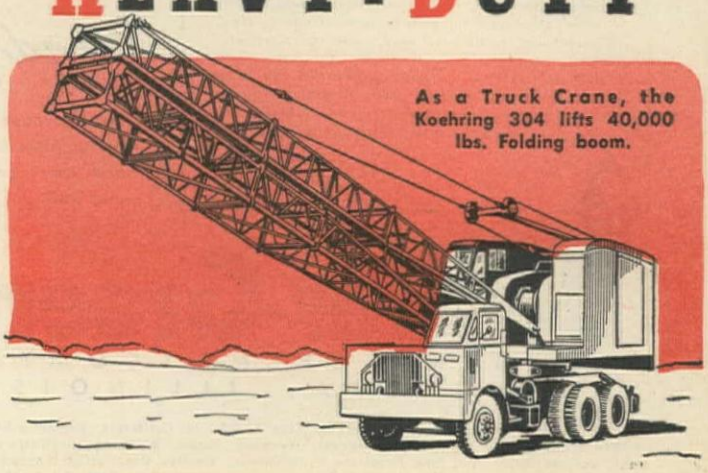
Lifting Capacities:
12 ft. radius (75% Rating)—23,100 lbs.
30 ft. radius (75% Rating)—6,385 lbs.

Other Koehring excavators range in size from ½ to 1½ yards, all built to Heavy-Duty standards.

KOEHRING

Bay Cities Equipment, Inc., *Oakland*
Columbia Equipment Co., *Portland, Boise*
Harron, Rickard & McCone Co. of Southern California, *Los Angeles*
Kimball Equipment Co., *Salt Lake City*
McKelvy Machinery Co., *Denver*
Moore Equipment Co., *Stockton*
Neil B. McGinnis Co., *Phoenix*
Pacific Hoist & Derrick Co., *Seattle*
The Harry Cornelius Co., *Albuquerque*
Western Machinery Co., *Spokane*

HEAVY-DUTY



As a Truck Crane, the Koehring 304 lifts 40,000 lbs. Folding boom.

KWIK-MIX

NEW 11-S END OR SIDE DISCHARGE

Fast charging, rapid discharge, thorough mixing and lasting strength are the outstanding features of the 11-S Kwik-Mix Dandie concrete mixer. Dandie mixing action folds as it mixes. Heavy duty all-welded frame resists twisting. Tilted flow-line discharge chute empties drum in approximately 7 seconds. Selective skip shaker does not shake until skip is partially emptied and ready for shaking.

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

DANDIE MIXER

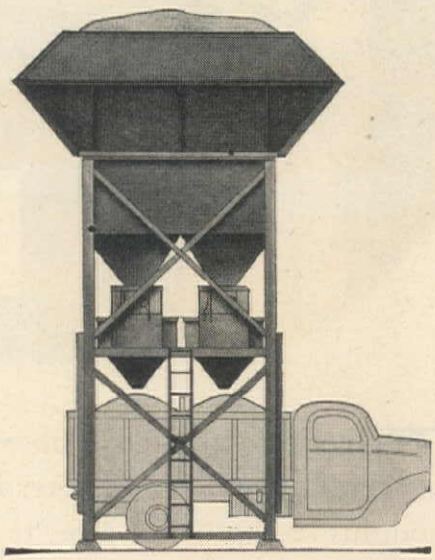
JOHNSON

LOADS 2-BATCH TRUCKS ON 1 STOP

Johnson Dual Aggregate Batch Plant discharges two full batches simultaneously, in the same time it takes other plants to deliver one batch. 2-Batch trucks loaded in one stop. Extra stops eliminated. Often, fewer trucks are needed. Always, less danger of time lost at the paver. 100 yard capacity; 3 compartments; 2 multiple material batchers. Fully portable.

Bay Cities Equipment, Inc.	Oakland
Cramer Machinery Company	Portland
Edward R. Bacon Company	San Francisco
Harron, Rickard & McCone Co. of So. Calif.	Los Angeles
McKelvy Machinery Company	Denver
Neil B. McGinnis Company	Phoenix
Pacific Hoist & Derrick Company	Seattle
The Harry Cornelius Company	Albuquerque
Western Machinery Company	Spokane
Western Machinery Company	Salt Lake City

1-STOP BATCH PLANT



PARSONS

CLEAN BUCKETS GET BIG BITES

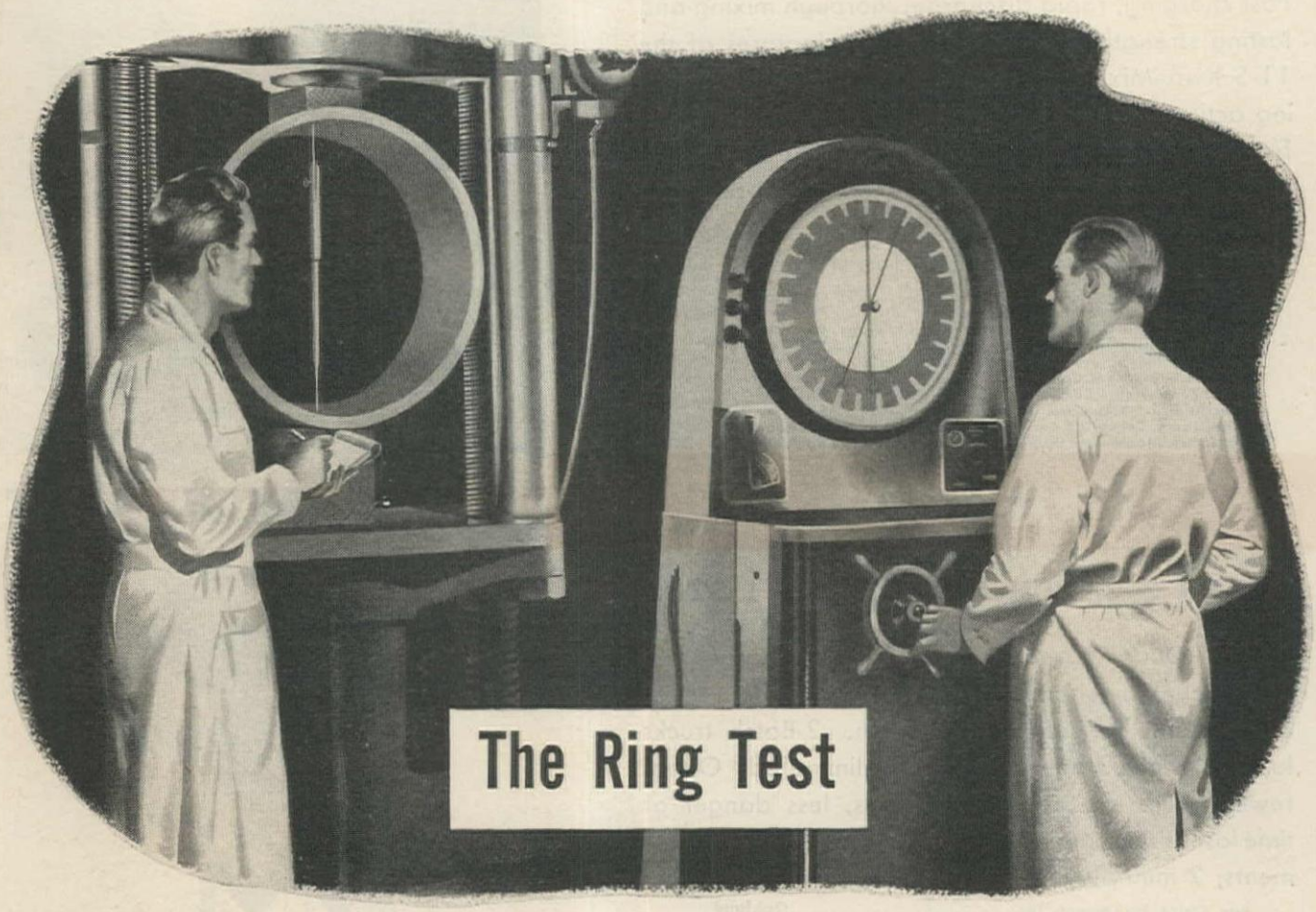
On the Parsons 250 Trenchliner, each bucket that bites into the trench is clean, empty, ready to take a big, full load. Spring-mounted bucket scraper cleans out sticky material as each bucket is dumped. Even gumbo clay can't stick to cut down trenching efficiency. Lightweight, high strength buckets, forged bucket teeth, heat-treated chain links, self-locking connecting pins.

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

TRENCHLINER

Reg. U. S. Pat. Off.

PUTTING SCIENCE TO WORK



THE ring test, shown above, is a scientific method for determining the modulus of rupture of pipe. It is not a required acceptance test but one of the additional tests made by cast iron pipe manufacturers to ensure that the quality of the pipe meets or exceeds the requirements of standard specifications.

A ring, cut from random pipe, is subjected to progressively increased crushing load until failure occurs. Standard 6-inch cast iron pipe, for example, withstands a crushing weight of more than 14,000 lbs. *per foot*. Such pipe meets severe service requirements with an ample margin of safety.

Scientific progress in the laboratories of our members have resulted in higher attainable standards of quality in the production processes. By metallurgical controls and tests of materials, cast iron pipe is produced today with precise knowledge of the physical characteristics of the iron before it is poured into the mold. Constant

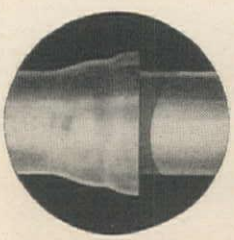
CAST IRON PIPE

TO PROTECT PIPE QUALITY

control of cupola operation is maintained by metal analysis. Rigid tests of the finished product, both acceptance tests and routine tests, complete the quality-control cycle. But with all the remarkable improvements in cast iron pipe production, we do not forget the achievements of the early pipe founders as evidenced by the "Survival and Retirement" report recently published by the A. W. W. A. Of all the cast iron pipe laid in the 25 cities studied, some as early as 1817, more than 96 per cent of all pipe, 6 inches and over, is still in service.

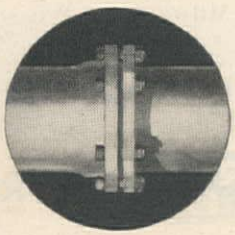
"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."

Joints for Cast Iron Pipe



Bell-and-Spigot Joint: the standard joint for water and sewerage service.

A variety of joints are available, of which the two most widely used are illustrated. Special purpose joints such as the Ball-and-Socket, or Flexible Joint for underwater use, and the Flanged Joint for above-ground use, are also available.



Mechanical Joint: bottle-tight and flexible, now with interchangeable parts.

"SILENT SERVICE is not enough"—A.W.W.A.

The American Water Works Association is recommending to its members, for local action, a sound, well-planned program of Public Relations publicity and advertising. It is based on the premise that good water service, like good health, is too often taken for granted, in which case favorable public opinion is dormant.

To co-operate with this program and help to arouse national recognition of the efficient service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* readers of "Time" and "Nation's Business" throughout 1947.

For example, the following human-interest cartoon and excerpts from a current advertisement.

"biggest penny in the world"

It buys you more than 500 glasses of safe, palatable water supplied by your public water supply system. Yes, the penny you spend for that indispensable service—*water* service—has the highest purchasing power in the world. Less than ten of them buys 300 gallons (average daily family consumption) delivered to your faucets. Yet few of us stop to consider that this convenient, reliable, low-cost service is due to the efficiency of America's public water supply systems.

Another big reason for the low cost of water is cast iron pipe because of its low maintenance cost and unequalled long life.

A good water supply rarely receives public recognition because, like good health, it is taken for granted. But it is the community's greatest asset, guarding health, life and property. Cast Iron Pipe Research Association, T. F. Wolfe, Engineer, 122 So. Michigan Avenue, Chicago 3, Illinois.

SERVES FOR CENTURIES

BUCYRUS ERIE

CONTROL PUTS THE BUCKET IN HIS HAND!

Bucyrus-Erie 22-B Dragline, owned by J. S. McElvany, El Centro, Calif., on drainage excavation in Imperial Valley.

The "feel" is so accurate, the response so quick and positive that Bucyrus-Erie Excavators handle as if the bucket were right in the operator's hand. This is because of the big, slow-speed, smooth-gripping clutches and brakes, and the simple, *direct* control from lever to band or from lever through booster to band.

Operating mechanism is so simple that levers require only light pressure — yet give direct, consistent response without lag. Levers are all grouped within easy reach of the operator. Lever throw is short for convenience, but long enough for positive action.

Every phase of excavator operation is always under complete control — permitting a smooth, fast pace that adds up to big output, from beginning to end of every shift. Let your Bucyrus-Erie distributor give you the full story about the easy, fast operation and many other profitable features of Bucyrus-Erie excavators. Bucyrus-Erie Company, So. Milwaukee, Wisconsin.

Bucyrus-Erie Shovels, Draglines, Clamshells, Cranes, Dragshovels—⅜ to 2½ yds.

111E47D

SEE YOUR BUCYRUS ERIE DISTRIBUTOR

EXC-2

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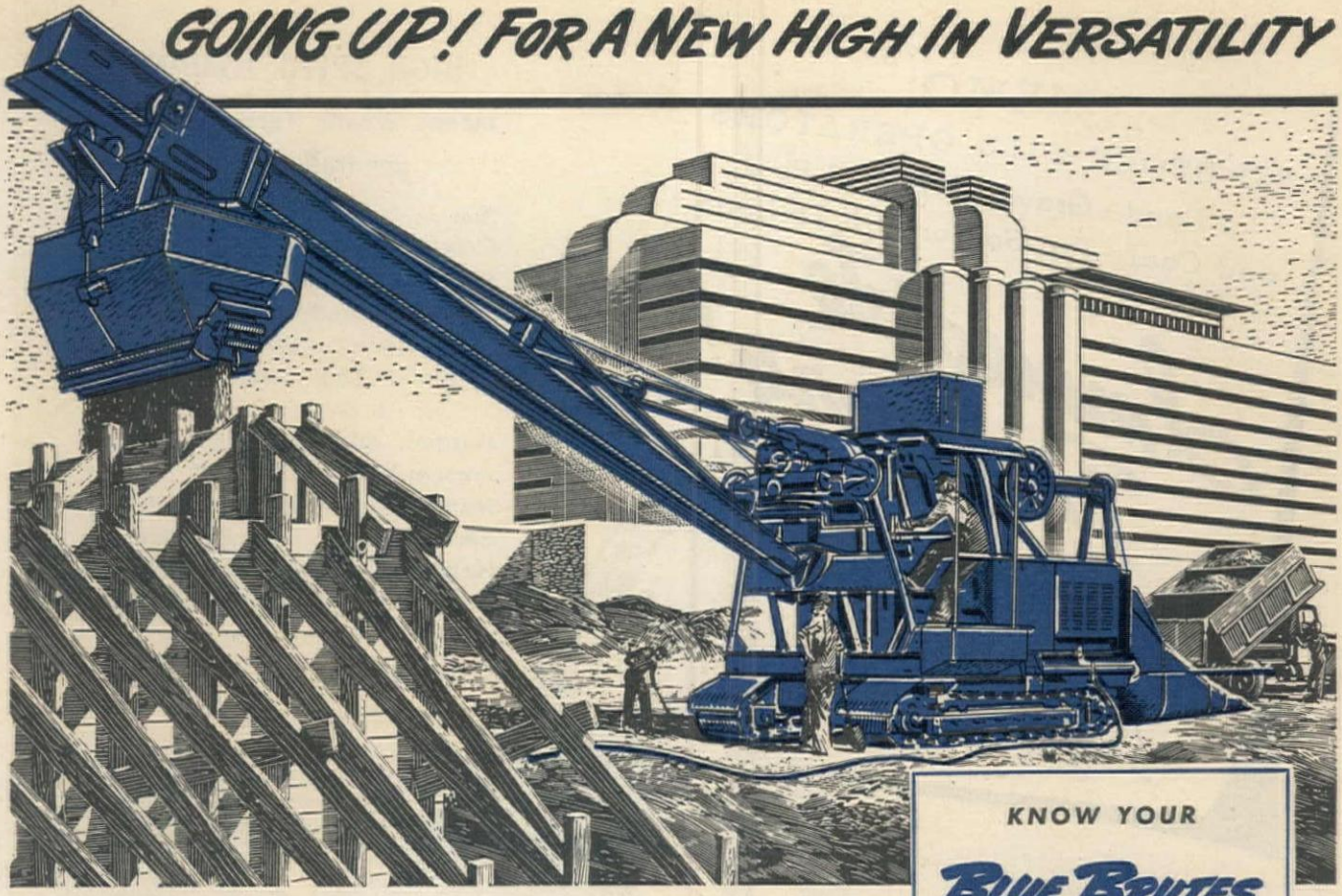
CROOK COMPANY	Los Angeles
CLYDE EQUIPMENT COMPANY	Portland — Seattle
INTERMOUNTAIN EQUIPMENT CO.	Boise — Pocatello — Spokane
THE LANG COMPANY	Salt Lake City
THE O. S. STAPLEY COMPANY	Phoenix
R. L. HARRISON COMPANY, INC.	Albuquerque
BROWN TRUCK & EQUIPMENT COMPANY	Reno

Shovels • Dragshovels • Draglines • Clamshells • Cranes • ⅜ to 2½-yd.

GOING UP! FOR A NEW HIGH IN VERSATILITY



In the Ransome 34E Blue Brute Paver, with elevated boom attachment, you have a mobile, all-purpose mixing plant that can take a lot of *different*, off-highway jobs in its stride.

High foundation walls, isolated bridge piers and other hard-to-get-at spots are easily reached by the fast-swinging "live" boom that raises the discharge bucket to a 20-ft. clearance. And the positive hydraulic operation of both boom and bucket assures exact pouring-control, eliminating the need — and the risk — of a man to manually discharge the bucket at the top of a high form or batch hopper.

More Ransome Advantages

Features like these — automatic bucket-lock that prevents accidents when operating with elevated boom; unobstructed bucket opening that eliminates segregation; wide, long crawlers that go almost anywhere regardless of mud, sand or rough ground — all pile up proof that Ransome 34E Pavers, Single Drum or Dual Drum, can go farther, do more work faster, and cut costs every foot of the way.

Write for *all* the facts. Learn why *there's more worth in a Blue Brute.*

R7.6

BUY BLUE BRUTES

KNOW YOUR

BLUE BRUTES

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

RANSOME EQUIPMENT

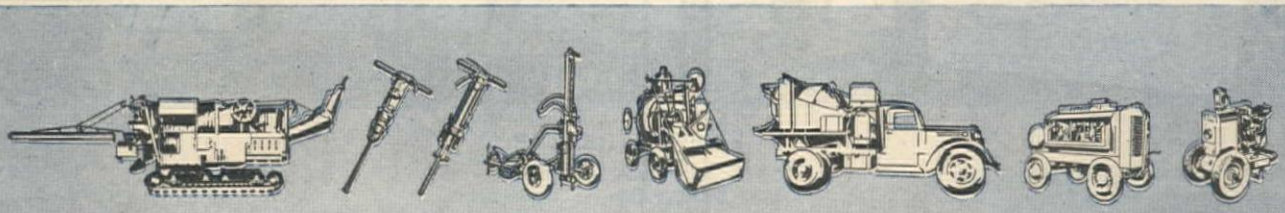
Pavers, Portable and Stationary Mixers, Truck Mixers, Pneumatic Placing and Grouting Equipment and Accessories.

WORTHINGTON EQUIPMENT

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

WORTHINGTON

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

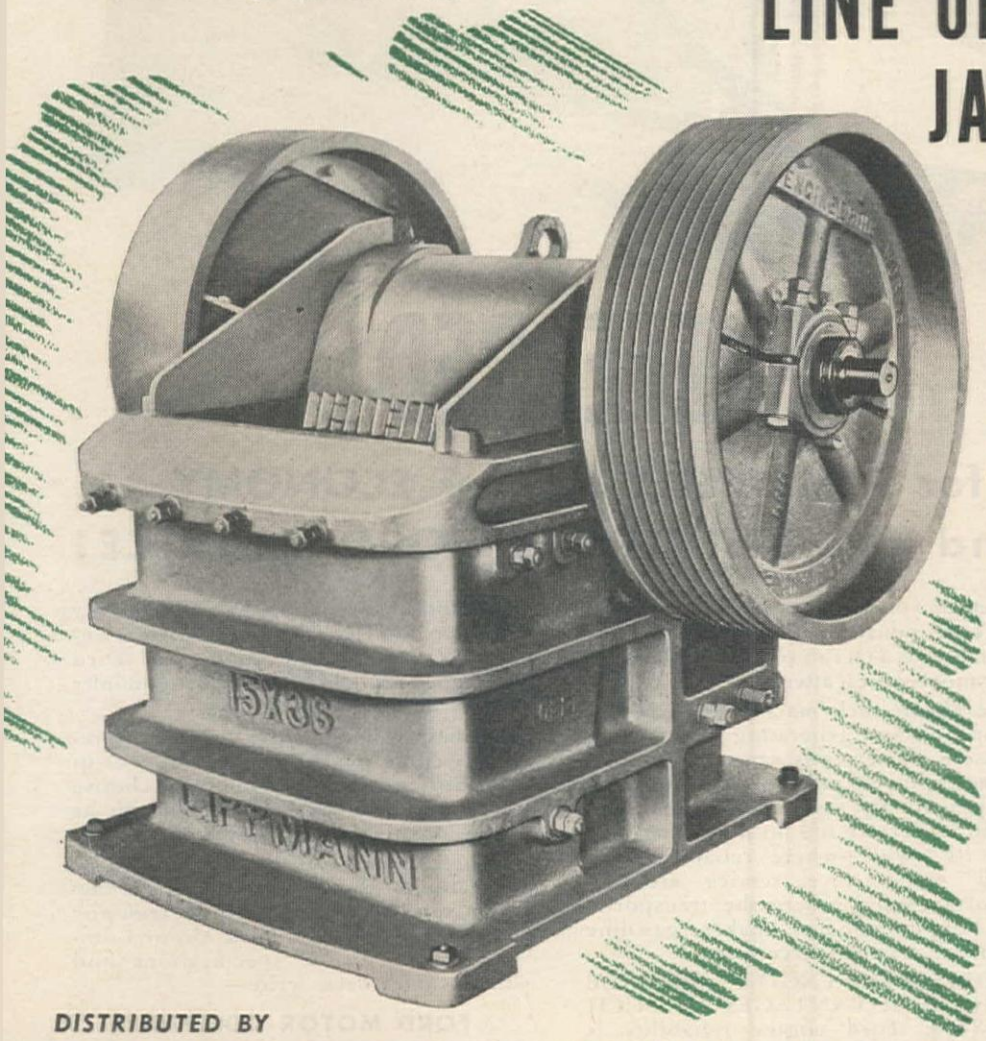


IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

Announcing...

LIPPMANN'S POST-WAR LINE OF ALLOY STEEL JAW CRUSHERS!

Higher capacities with reduced weight. The new Lippmann 15 x 36 Alloy Steel Jaw Crusher is one of the complete Heavy Duty Line that ranges up to 36 x 48 size.



Read How Stronger Design of New Lippmann Heavy Duty Crushers Gives You Higher Capacities, Wide Range of Product Sizes . . .

A complete new line of Heavy Duty Heat-Treated Alloy Steel Jaw Crushers — that's the latest contribution of Lippmann Engineering to rock and ore reduction.

Alloy steel frame, jaw and bearing caps, plus forged alloy steel shaft, give you a rugged crusher designed for high capacity production. *No Lippmann crusher with proper maintenance has ever had a shaft or bearing failure!*

Extended jaw length gives greater nip, prevents rocks from squirting out. Increased crushing surface, the largest of any comparable size crusher, provides wide range of product sizes, permits finer settings, lessens need for added processing. Force-down feed means increased output.

The same skilled engineering that created the Heavy Duty Jaw Crusher goes into all Lippmann products. Check the list at left. And the next time you have a tough job, call on Lippmann.

DISTRIBUTED BY

BALZER MCHY. CO., Portland • F. J. BALZER CO., Seattle
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LIPPMANN ENGINEERING PRODUCTS for PITS, MINES, QUARRIES

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

LIPPMANN ENGINEERING WORKS
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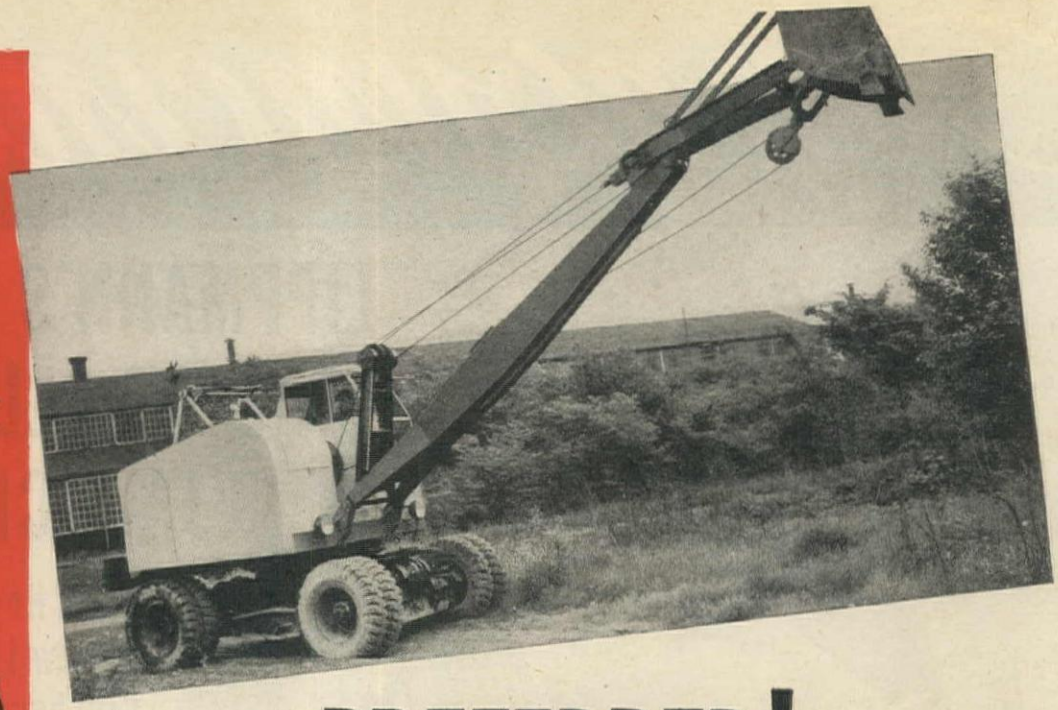


PREFERRED!

—for RELIABILITY . . . for ECONOMY . . . and for UNIVERSAL FORD SERVICE!

Whether you *design* and *build* engine-powered industrial equipment, *sell* it, or *use* it, here is a fact so vital that it deserves your most earnest attention:

Nearly all such machinery—whether pumps, electric generating plants, compressors, power units, saw rigs, ventilating and spraying units, or other portable equipment—by its very nature, will spend its service life on jobs where it's "on its own"—where reliability and ready maintenance service are all-important—and where the transportation of motor fuel makes gasoline economy a constant concern.

FORD-BUILT ENGINES PROVIDE UNIQUE ADVANTAGES IN SUCH SERVICE. Ford engine reliability is known and respected the world over. Millions of Ford vehicle owners and automotive mechanics are thoroughly familiar with Ford engines. Ford economy is famous. And Authorized Ford Service is available in every community of any importance.

Certainly, then, if your power requirements come within the range of 40 to 100 horsepower, you could not choose an engine which would offer you as many positive advantages as Ford.

Three Ford-built engines are now available, as shown below. You can buy them singly or in quantity, through any Ford Dealer or from Ford Motor Company. For detailed specifications and dimensional data, write—

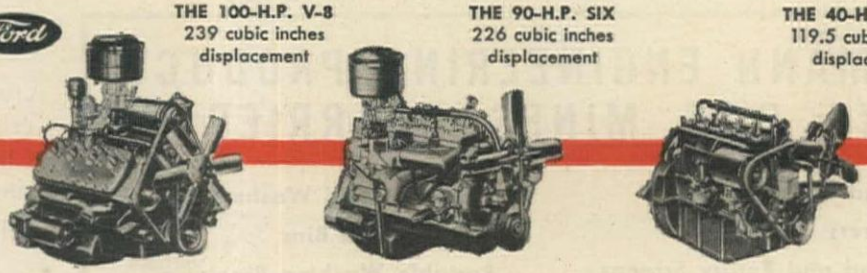
FORD MOTOR COMPANY
Industrial and Marine Engine Department
3515 SCHAEFER ROAD, DEARBORN, MICHIGAN

Ford

THE 100-H.P. V-8
239 cubic inches displacement

THE 90-H.P. SIX
226 cubic inches displacement

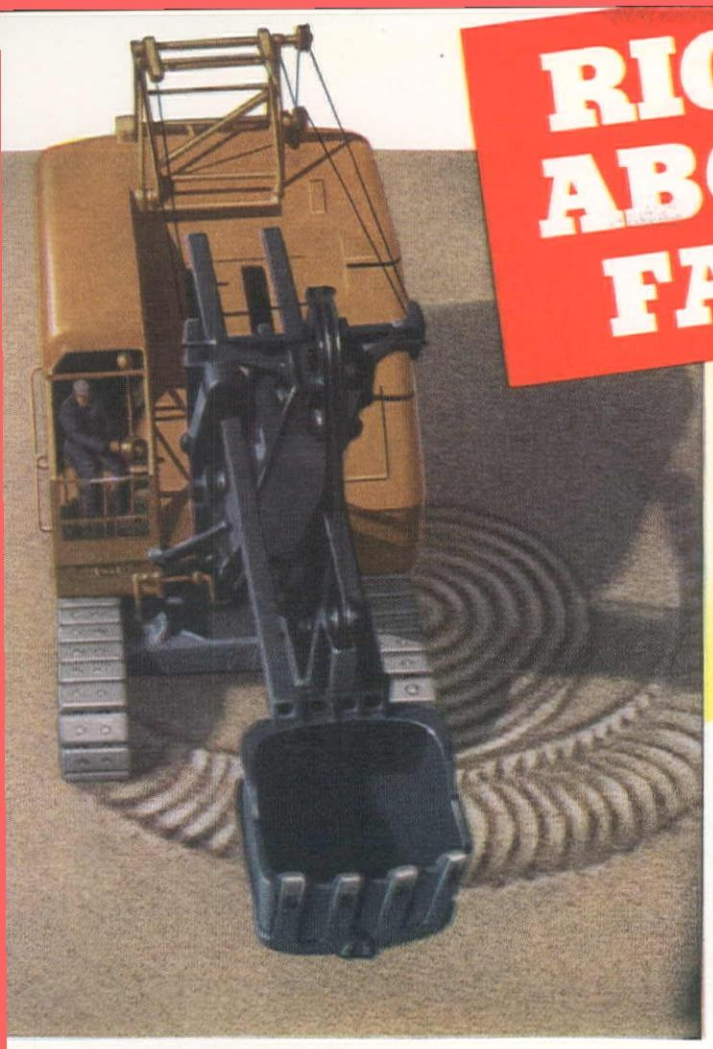
THE 40-H.P. FOUR
119.5 cubic inches displacement



FORD-BUILT ENGINES

FOR INDUSTRIAL AND MARINE POWER

RIGHT ABOUT FACE



Sworls on the ground show how P&H can "turn on a dime" — all motions are easily controlled from operator's cab. No need for blocking the crawlers.

P&H's easy steering is ideal for easy maneuvering in cramped quarters; for faster move-ups. You can make gradual turns, sharp turns or rightabout-face.

How EASIER STEERING pays dividends

• Here's an exclusive and simplified means of steering and braking. Cam type steering is combined with independently operated hydraulic brakes to provide the most flexible and maneuverable steering ever offered on equipment of this kind.

P&H's easier maneuvering on all types of jobs — over all kinds of ground — means more efficient operation — more time for actual production — greater yardage. And, with P&H's true tractor type crawlers, you have the dependable performance that saves time and money on every job — every day. Add up these savings over a period of years and you have a substantial figure.

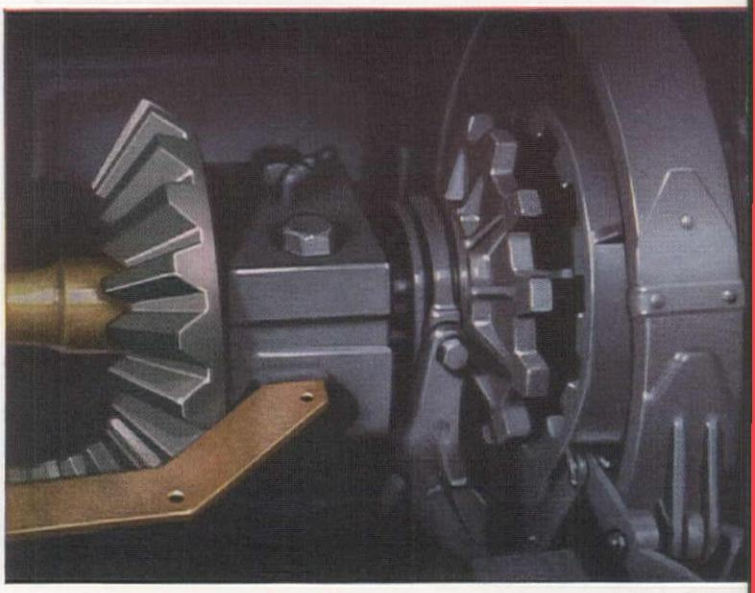
Easier steering is but one of many of P&H added values. Learn about *all* of them.

Look to **P&H** for added values

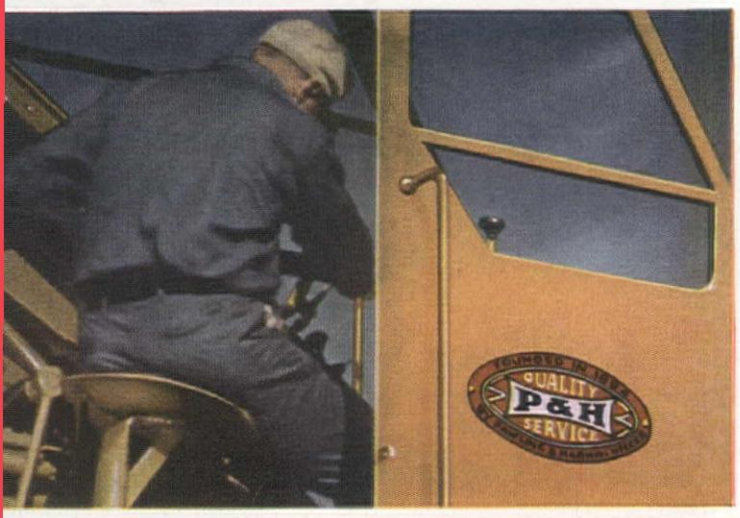
ANOTHER P&H ADDED VALUE

EASIER STEERING --BETTER BRAKING

HANDY LEVER ENGAGES JAW CLUTCHES. Steering of the machine is effected by a combination of sliding jaw clutches on the propel shaft and hydraulic band brakes on driving sprocket mechanism. Clutches, which transmit driving force to either or both crawlers, are engaged or disengaged by this handy lever located beside the operator.



HOW JAW CLUTCHES OPERATE. Two of these sliding jaw clutches, on opposite ends of the horizontal propel shaft, transmit driving force to the crawler mechanism. Either one or the other may be engaged or disengaged at will to propel crawlers simultaneously or individually, forward or reverse.



STEERING WHEEL CONTROLS ALL MOTIONS OF CLUTCHES AND BRAKES. By turning this hand steering wheel, it operates the cam gear. The operator selects any combination or arrangement of jaw clutches and steering brakes. You can make sharp or gradual turns, easily and quickly without stopping.

INDEPENDENT CRAWLER BRAKES PREVENT ROLL-BACKS AND RUNAWAYS. These positive locking P&H brakes may be operated in either of two ways: by the hand wheel as steering brakes — or by independent hydraulic control. Both are conveniently located, within easy reach for the operator.

Learn about easier steering and other P&H added values. See your nearest P&H representative or write us for complete information.

HARNISCHFEGER CORPORATION:
MILWAUKEE, Wis., 4490 W. National Avenue
SAN FRANCISCO, Calif., 82 Beale Street
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PORTLAND, Oregon.....Loggers & Contractors Machinery Co.
WILLOWS, California.....Willows Motor Sales Co.
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FRESNO, California.....Brown Tractor Co.
SAN DIEGO, California.....Southern Equipment & Supply Co.
SPOKANE, Washington.....F. M. Viles & Co.
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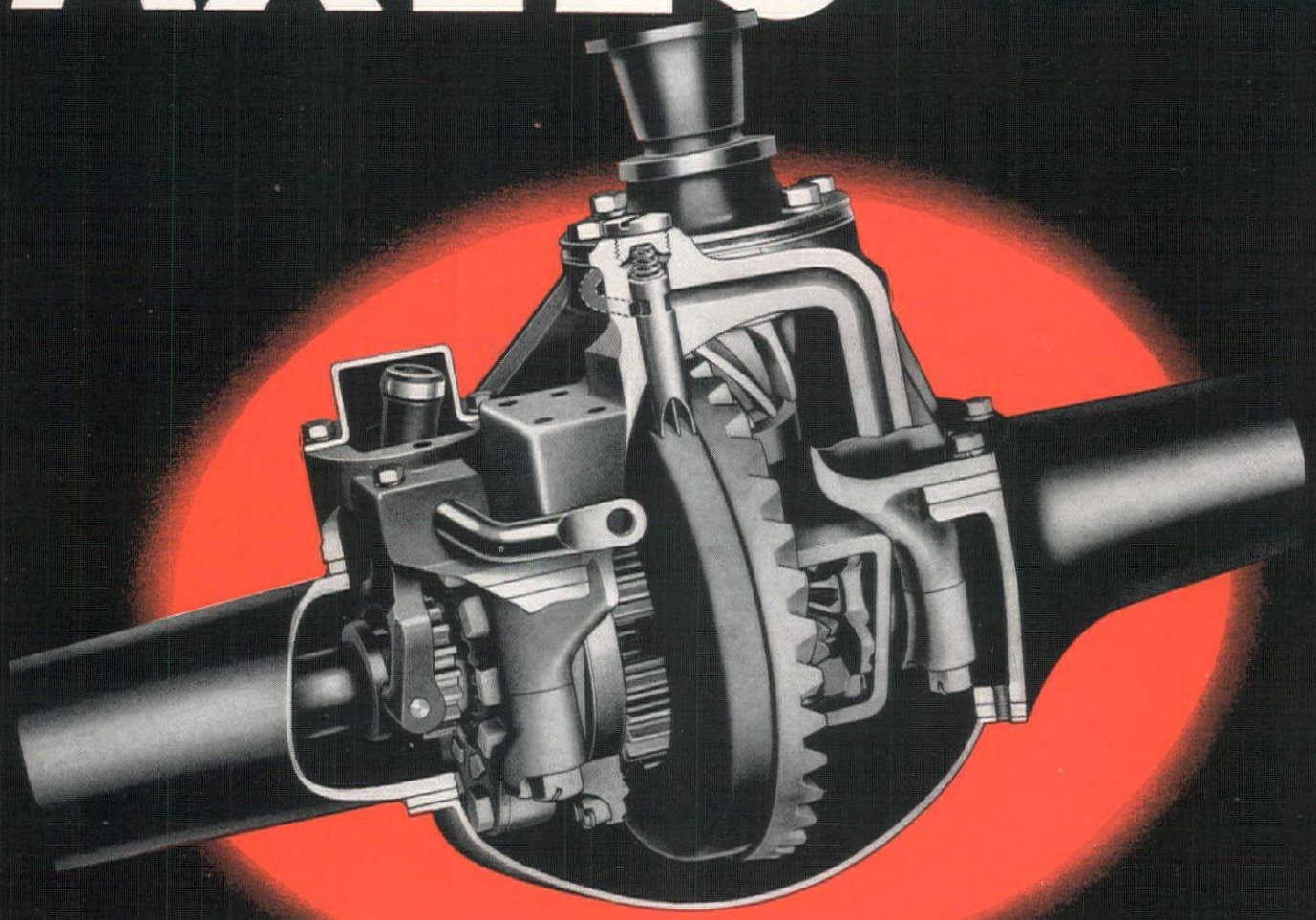
CORPORATION
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

EATON
2-SPEED
Truck
AXLES



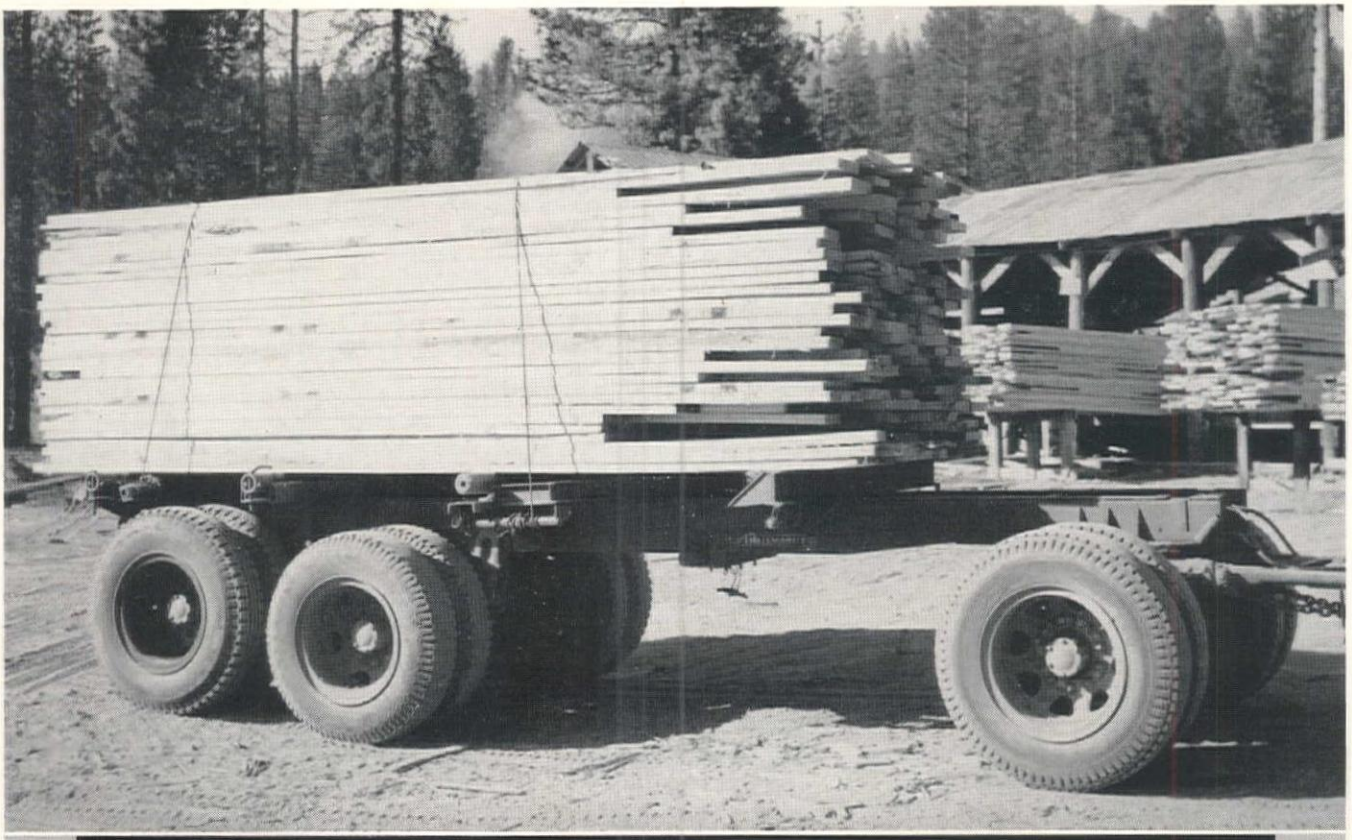
Engineered to the Truck for Maximum Trouble-Free Performance

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

EATON MANUFACTURING COMPANY

Axle Division

CLEVELAND, OHIO



"Trailmobiles Can Take It"—
Says Harold Kinser

The Kinser Trucking Company of Sonora, California, have a pair of Trailmobiles which they use in hauling lumber from the mills to points throughout California. One of their Trailmobiles has logged 150,000 miles and another over 100,000 without any trouble whatever.

On one occasion Kinser hauled a D-8 tractor under highway patrol permit from Confidence, about 20 miles above Sonora, to Redwood City on the Peninsula. The tractor weighed 38,300 pounds gross. Said Kinser: "Lumber trailers are not built for that kind of hauling—but the Trailmobile surely handled it well."

There are Trailmobiles for every hauling requirement in the forest products industry—logging dollies, flat beds for hauling finished lumber, and low beds for hauling heavy equipment. Whenever you need a trailer for any purpose—tell TRAILMOBILE about it.

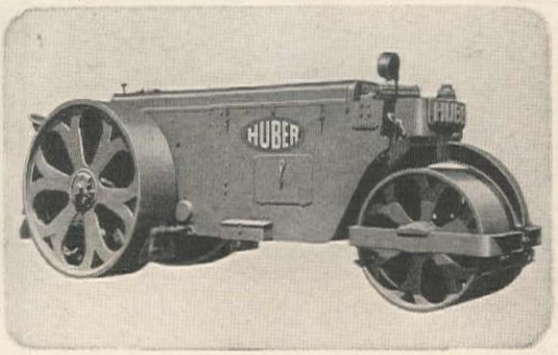
TRAILMOBILE

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

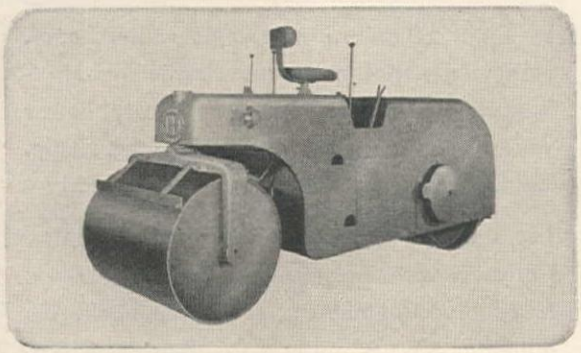
WHAT INTERESTS YOU MOST IN A ROAD ROLLER OR MAINTAINER?

Isn't it ability and capacity to do the jobs for which they are intended quickly and at the lowest possible cost?

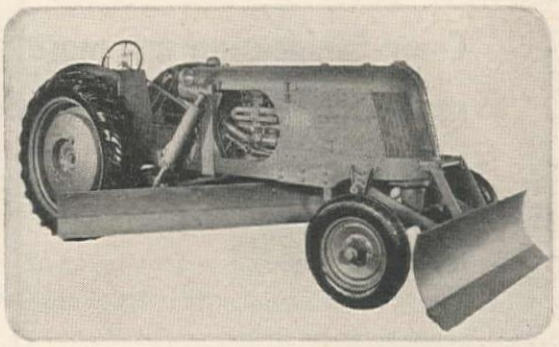
Then look no further than Huber 3-Wheel Rollers, Huber Tandem Rollers, and the popular Huber Maintainer, for in all three of these dependable road building and maintenance machines you have the very things for which you are looking. They have the simple design that reduces maintenance to a minimum; the speed, power, and stamina to make short work of any road job, and offer the maximum in operating economy based on a thorough knowledge of your requirements. Why not talk this over with your Huber Distributor?



HUBER 3-Wheel ROLLERS
Automotive type, built in sizes from 5 to 12 ton.



HUBER TANDEM ROLLERS
Variable weight, built in sizes from 3 to 12 ton.



HUBER MAINTAINER—A versatile machine that also serves as a bulldozer, lift-loader, patch roller, snowplow, or rotary boom.

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

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JENKINS & McCLOUD.....Reno, Nevada
CONTRACTORS' EQUIP. & SUPPLY CO., Albuquerque, N. M.
NEIL B. McGINNIS CO.....Phoenix, Arizona
FEENAUGHTY MACHINERY CO.....Portland 14, Oregon
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FEENAUGHTY MACHINERY CO.....Seattle 4, Washington
FEENAUGHTY MACHINERY CO.....Spokane 2, Washington
WESTMONT TRACTOR & EQUIPMENT CO., Missoula, Montana
EDWARD F. HALE CO.....Hayward, California
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FOULGER EQUIPMENT CO., INC.....Salt Lake City 8, Utah
THE COLORADO BUILDERS' SUPPLY CO., Denver 9, Colorado
THE COLORADO BUILDERS' SUPPLY CO., Scotts Bluff, Nebr.
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This is no swivel-chair theory!

Color Engineering ups morale—makes production costs go down

Your manufacturing clients put color into their products because they know that *color sells.*

If *color* can make customers buy more—then *color* can make employees try more. It's the same basic emotional response!

Many Western manufacturers have proved it by Color Engineering ceilings, walls, floors, equipment, machinery and traffic signals—literally *painted in* greater safety, better working light, more relaxing backgrounds. Employee morale went up—every time!

Let a Fuller representative show you actual Color Engineering surveys—give you Fuller's free Color Engineering procedure book. No obligation! W. P. Fuller & Co., San Francisco. Branches and Dealers throughout the West.

NEW—LZI Metal Primer....

NEW—the finest structural steel rust inhibitor we've ever made—finest we've ever seen. Lowers first cost, application cost, maintenance cost. Saves three ways over all others. Provable, too!

Fuller floor finishes—*proved in use!*

Specify the floor preservatives that have won so many competitive tests—for arenas, "gyms," public buildings, industrial plants.

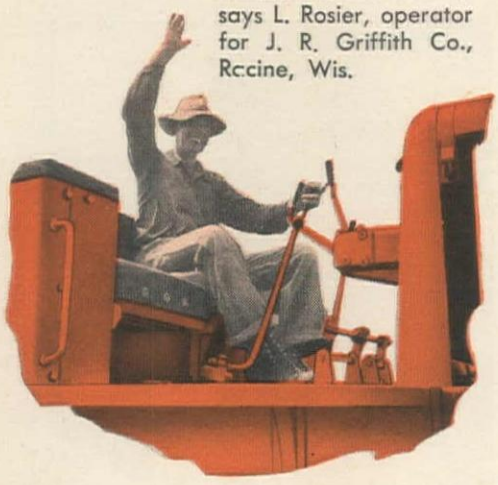
An Operator's Dream Tractor

NOT ONLY THE WORLD'S LARGEST, MOST POWERFUL...
HD-19 is the World's Easiest-to-Operate, Most Comfortable Tractor

Weight; 40,000 lbs.

Horsepower; 163 at flywheel

"Driving the 19 is like fingering piano keys compared to operating the conventional tractor," says L. Rosier, operator for J. R. Griffith Co., Racine, Wis.



Yes, it's a pleasure to operate the NEW Allis-Chalmers HD-19, hydraulic torque converter tractor. Everything possible has been done to make the operator's job easier.

Shifting is practically eliminated. There are only TWO forward gear ratios — 0 to 3.0 and 0 to 7.0 m.p.h.; ONE reverse, 0 to 5.5. Torque converter makes this possible — automatically selects the maximum speed in each of these wide speed ranges at which load can be moved.

No fighting with steering levers and brakes, either. There's hydraulic, finger-tip steering — just a slight pressure on the lever and the tractor turns immediately — and stays turned, no bouncing back. For a full turn, the slight pressure on the lever plus resting the foot on the self-energizing brake does the job — no tiresome pulling and pushing.

Other operating advantages include electric starting, a new type, adjustable split seat . . . wide arm rests . . . adjustable brake pedals . . . full visibility . . . comfortable foot rests and a clean platform.

A faster-working, more powerful tractor, more easily operated, means greater production . . . more yards moved day in and day out.

ALLIS-CHALMERS ORIGINATOR OF THE TORQUE CONVERTER TRACTOR

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

NEVER BEFORE

AN AIR OPERATED UTILITY JACKHAMER

THE NEW J-10

with { UTILITY WEIGHT
REAL DRILLING POWER
AUTOMATIC ROTATION

Ideal for overhead line shaft work.

For the first time, a Rock Drill that is built for plant maintenance work. Fast, powerful, and easy to handle, this *featherweight tool* drills as easily on a scaffold as it does on the ground. Because it has *built-in rotation*, it is no longer necessary to use hand rotated or makeshift tools.

The J-10 Utility Jackhamer makes short work of holes for hangers, anchor bolts, foundation bolts, pipe, conduit, dowels, and reinforcing rod. It is also ideal for plug and feather work.

This machine will tear out brick work in furnaces, doorways, and windows. It is used for cutting anchors for girders and joists. In short, the uses to which it can be put is limited only by the ingenuity of the user.

Write our nearest branch or distributor and have a salesman call.

Pipe clamp drilling is easy with the J-10.

Ingersoll-Rand

11 Broadway, New York 4, N. Y.

45-5

CHOSEN TO POWER THE WORLD'S LARGEST, MOST POWERFUL TRACTOR

Brute strength and velvet control are combined in the new Allis-Chalmers HD19. 40,000 lb. torque converter tractor, powered by a 6-cylinder General Motors 2-cycle Diesel engine.

—the General Motors Diesel Engine

The new Allis-Chalmers HD19 tractor with hydraulic torque converter is powered by a General Motors Series 71 2-cycle Diesel engine.

To quote Allis-Chalmers, this new, mighty tractor was "built to get more work done—built to last longer with less upkeep." The GM Diesel with its wealth of smooth dependable power will do its full share in making good on both points.

Allis-Chalmers' selection of the GM Series 71 engine for the world's largest, most powerful tractor is in line with the thinking of more and more builders of shovels, cranes, soil stabilizers, pumps, air compressors, ditchers, dirt wagons and other heavy road-building and contractors' machinery.

The GM Diesel engine is the logical choice where quality of manufacture and PERFORMANCE count.

DETROIT DIESEL ENGINE DIVISION

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

GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

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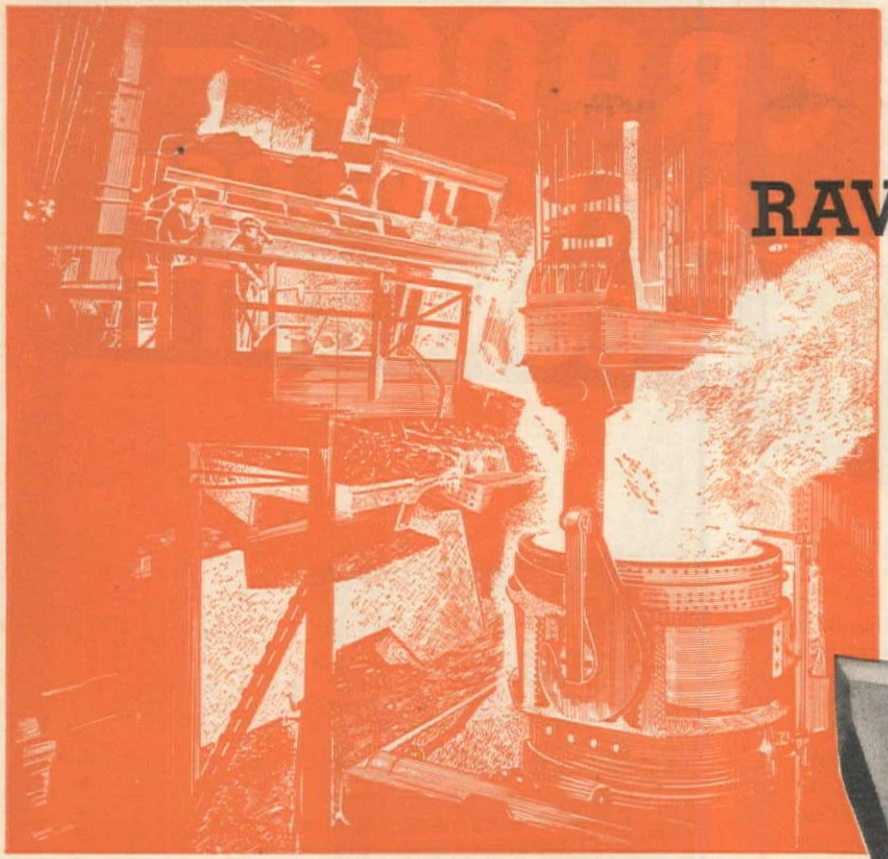
Olson Manufacturing Co. BOISE, IDAHO
Capitol Tractor & Equipment Co. SACRAMENTO, CALIF.
Anderson-O'Brien Co. LOS ANGELES 21, CALIF.



FROM RAW MATERIAL TO FINISHED BIT

IT'S TIMKEN® THROUGH AND THROUGH!

Every ounce of steel that goes into Timken Rock Bits comes from Timken furnaces and is constantly under the control of Timken metallurgists. Developed as a direct result of our long specialized experience in steel manufacture and treatment it is the finest material ever produced for removable rock bits and is basically responsible for the outstanding performance, endurance and economy of Timken Bits in all kinds of rock.

Only in Timken Bits can you have the advantage of Timken steel plus Timken scientific design and precision manufacturing practice. We'll be glad to run tests under your operating conditions at any time.

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

ROCK BITS

LIMA CRANES — for SPEEDY, LOW-COST HANDLING OF CONCRETE

It takes modern equipment and plenty of "know how" to keep a vital job like the John Lovejoy Elliott Housing Project, New York City, progressing smoothly and efficiently. It particularly calls for a full-functioning machine... H. R. H. Construction Corporation, general contractors on the job, are using a LIMA Type 802, 40 ton capacity lifting crane to hoist the concrete for the floor and column forms. The crane is equipped with a 120′ boom and 25′ jib. It is capable of hoisting the loaded bucket to a height of 13 floors. This is done quickly, safely and economically because the low center of gravity of LIMA cranes enables them to handle long booms without a tendency towards tipping. Independent clutches are important too on a job like this. With the Type 802 it is possible to hoist, swing, travel and boom up or down simultaneously—a feature common to most LIMA cranes of 35 tons capacity and larger. Investigate this modern way of handling concrete that has proved to be so economical. What LIMA cranes do for others they will do for you. Write today for crane bulletin No. 3D.

LIMA SHOVEL AND CRANE DIVISION

LIMA-HAMILTON CORPORATION

LIMA, OHIO

Offices in Principal Cities

THE LIMA DIAMOND

LIMA

FOR OVER 75 YEARS AN EMBLEM OF QUALITY WORKMANSHIP

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

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

A NEW 30-TON MACK

for Big-Load Construction Work

• Introduction of Mack's new Model LRSW six-wheeler brings new standards of performance and capacity to the heavy-duty construction field.

This big Mack packs its 30-ton payloads with unfaltering ease over the toughest of terrain. There's abundant power in its 275 h.p. supercharged diesel engine. Extra ruggedness in its massive all-welded frame. Positive traction at all times because of its Balanced Bogie and exclusive Power Divider which effectively transfers power to wheels having the most traction.

Mack's Duplex transmission provides 8 forward speeds in a single compact unit, with all ratios specially arranged for off-highway hauling. Safe and positive driving control is assured through such features as hydraulic power steering, air-assisted clutch, air-actuated brakes, easy turning radius and offset driver's seat.

All the way through Model LRSW is engineered for its own specialized job, built to move big yardage and do it profitably.

Find out how this new Mack dumper fits in with the demands of your excavating job. Call or write your nearest Mack branch or dealer.

Mack

since 1900, America's hardest-working truck

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

Trucks for every purpose

6107

Stainless Steel is TOUGH

tough to cut, too—but LINDE makes the job easier... just as easy as cutting carbon steel

LINDE's powder-cutting process overcomes the barrier to fast and economical cutting of stainless or chromium steels.

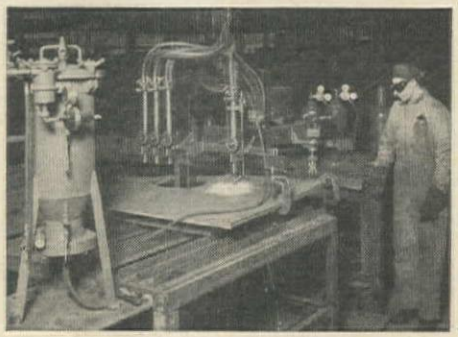
By means of easily installed attachments for standard oxy-acetylene equipment, powder-cutting can be done without substantial change from carbon steel cutting techniques.

IN FOUNDRIES—

by powder-cutting, risers are removed 20 times faster than by older methods. Removal of riser pads and gouging out defects can be done at considerable savings in cost.

IN STEEL MILLS—

a 12,000-lb. ingot can be powder-scarfed in 4 to 6 hours—about 1/10 the time required for grinding. Sizing of ingots, billets, and slabs, removal of hot tops, scrapping operations, and many other cutting jobs can be done in a fraction of the time previously required.



IN FABRICATING PLANTS—

a stack of twelve 10-ga., type-304 stainless sheets were powder-cut at 8 in. per min. . . . 4-in. I.D. by 8-in. O.D. flanges on ½ in., type 316 plates were made in 2 minutes of cutting time apiece.

If you work with stainless steel you will want to know more about this LINDE process. LINDE can supply the equipment you need, help you to set up, and supply the training help you need.

Linde

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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

In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

LIFT! LOAD! HAUL! DIG!

WITH A UNIT 357 MOBILE CRANE

IT'S SELF-PROPELLED

IT RIDES ON RUBBER

IT HAS 1001 USES

The UNIT 357 Mobile Crane is designed to handle a wide variety of jobs both on and off the highway. Compact . . . it works efficiently in close quarters. Sufficiently narrow for convenient road travel . . . and as easy to handle as an automobile.

Operated by ONE man . . . Powered by ONE engine . . . Full Vision Cab gives operator complete visibility in every direction.

The complete UNIT 357 story . . . its Low Cost . . . its Fast Delivery . . . its many modern and exclusive features will convince you. Write for it today!

UNIT CRANE & SHOVEL CORP. UNIT MILWAUKEE WISCONSIN

Distributed by

Contractors Equip. Co. ..... Portland, Oregon

Western Traction Co. ..... San Francisco, California

Service Equipment Co. ..... Seattle, Washington

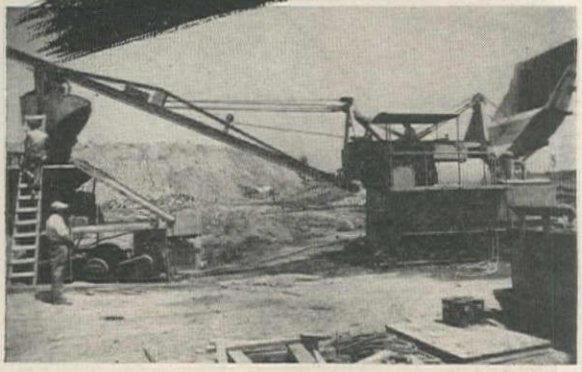
Idaho Machinery Co. ..... Boise, Idaho

State Tractor & Equip. Co. ..... Phoenix, Arizona

NIT CRANE and SHOVEL CORP., 6421 W. Burnham St., Milwaukee 14, Wis., U.S.A.

DID YOU SEE THAT ERROR?

DON'T BELIEVE IT!



MultiFoote 34-E Duo Mix (Dual Drum) Paver with elevating boom loading to a pumpcrete.

MULTIFOOTE ELEVATING BOOMS CLEAR 20 FT.!

A recent Foote Company ad got through with a typographical error saying that the MultiFoote elevated boom would clear 8½ ft. It isn't so! MultiFoote standard elevating booms will clear 18½ to 20 ft. and there are MultiFoote elevating booms in service, of special design, that will clear much more.

- 18½ to 20 ft. clearance.
- The only elevating boom proved in years of service.
- Bucket is adjustable to boom angles.
- All bucket operating mechanism is outside bucket.

Here is the elevated boom you need, a boom with real field experience of several years behind it. Available on 27-E Pavers, 34-E Single Drum Pavers and the 34-E Duo Mix—the big, fast MultiFoote Dual Drum Paver. Ask our sales agents for details.

THE FOOTE COMPANY, INC.
1940 State Street Nunda, New York

Builders of Adnun Blacktop Pavers, MultiFoote Concrete Pavers and Foote Kinetic Mixers

MULTIFOOTE CONCRETE PAVERS

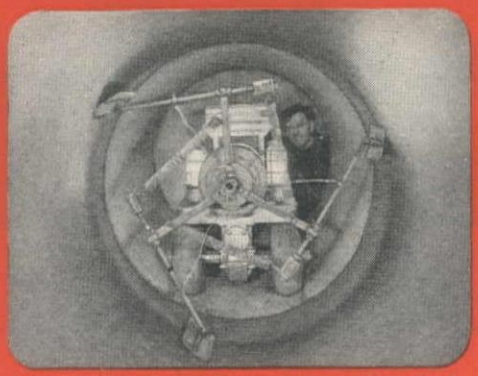
ADNUN BLACKTOP PAVER

Browning-Ferris Machinery Co., Dallas & Houston, Texas; Francis Wagner Company, El Paso, Texas; Smith Booth Usher Co., Los Angeles, Calif.; C. H. Grant Company, San Francisco, Calif.; Smith Booth Usher Co., Phoenix, Arizona; Western Equipment Co., Boise, Idaho, Spokane, Washington; The Colorado Builders' Supply Co., Denver, Colorado; Lively Equipment Co., Albuquerque, New Mexico; The Lang Co., Inc., Salt Lake City, Utah; Howard-Cooper Corp., Portland, Albany, Eugene, Central Point, Roseburg, Ore., Seattle, Wash.

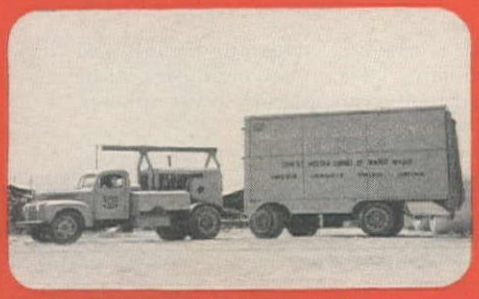
CENTRILINE

cement-mortar lining of water mains

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



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



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

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

Main Offices and Plant—
4635 Firestone Blvd., South Gate, Calif.

District Offices and Plant—
Oakland San Diego Portland, Oregon

. . . a service of

American PIPE AND CONSTRUCTION CO.

in the Western States

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

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

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

The American Pipe and Construction Co. has enjoyed a wide experience in the field of water supply line engineering and construction over a long period of years and this experience and training are available to water works officials and engineers.

Write for more detailed information concerning the remarkable Centriline Process.

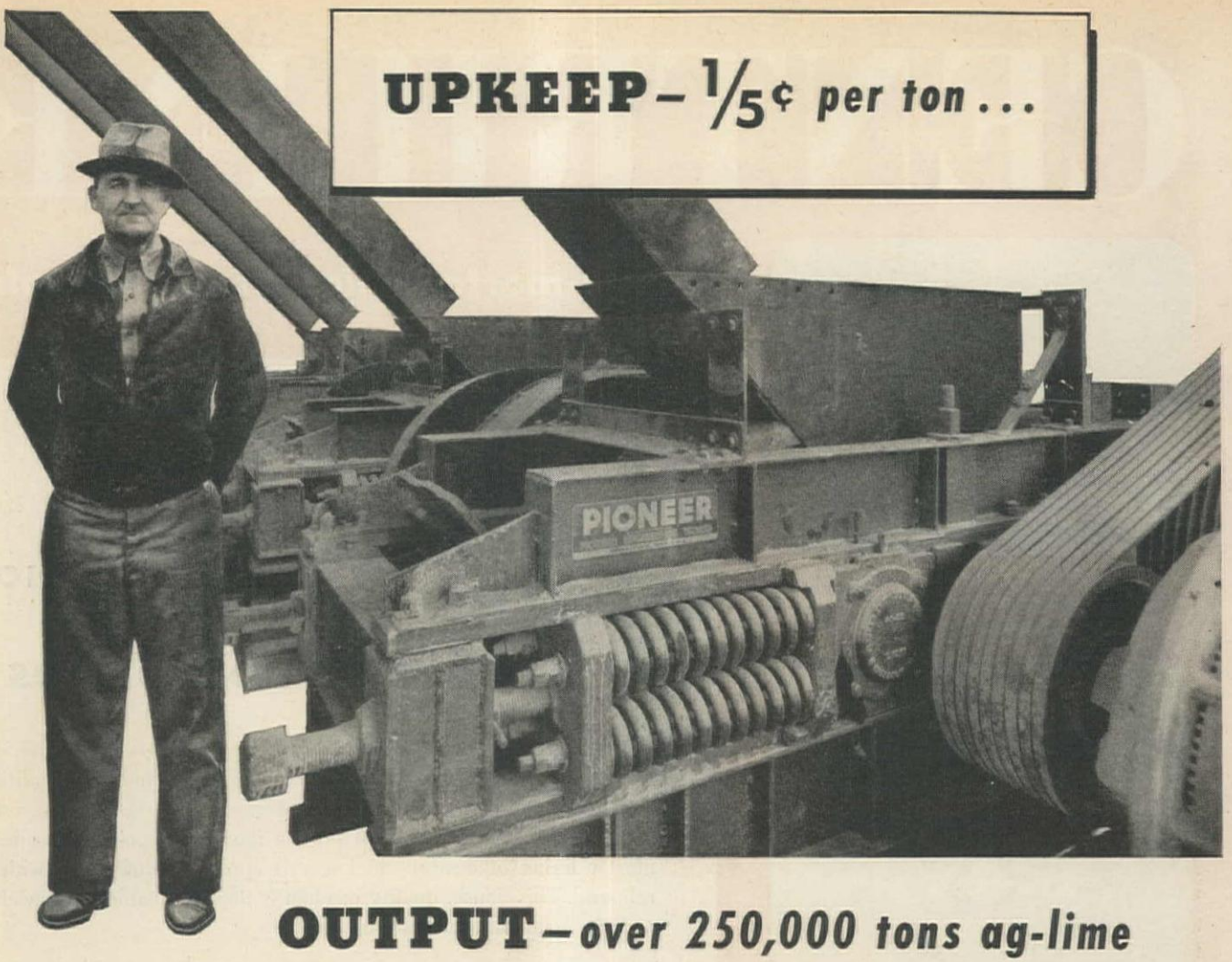
Centriline Division of

AMERICAN PIPE AND CONSTRUCTION CO.

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

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

UPKEEP – 1/5¢ per ton . . .



OUTPUT – over 250,000 tons ag-lime

"CAN YOU MATCH THESE FIGURES?" asks Paul Frank of North Vernon, Indiana. "During the past three years we've produced over a quarter million tons of ag-lime. Maintenance on our Pioneer Triple Roll Crusher and two 40x22 Double Roll Crushers has totaled less than $500. That averages less than 1/5¢ per ton upkeep.

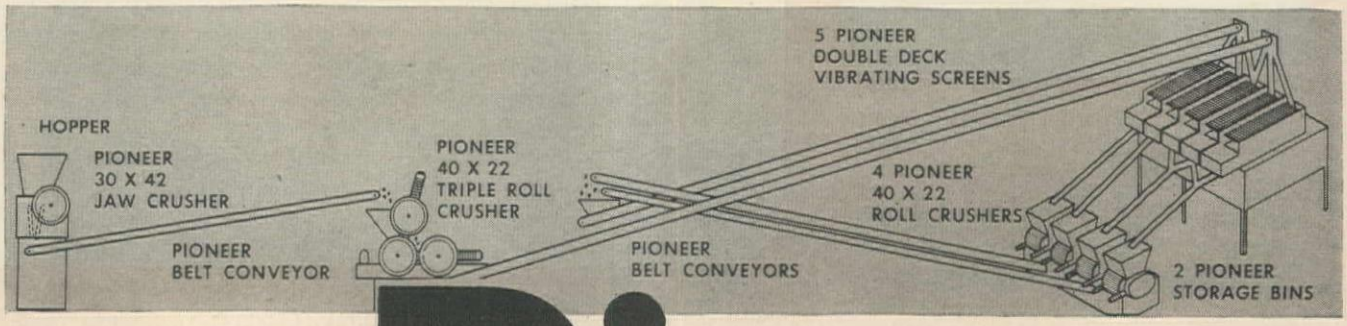
"It's been our experience that Pioneer Roll Crushers have a larger capacity for fine materials than any other type crusher. That's undoubtedly because 100% of the shell surface is a working surface.

"Right now two more 40x22 Pioneer Roll Crushers are being added to increase our ag-lime production."

If you have a crushing, screening or material handling problem, let Pioneer engineers show you how to get higher output with lower upkeep.

PIONEER ENGINEERING WORKS

1515 CENTRAL AVENUE • MINNEAPOLIS 13, MINNESOTA



Buy Both!

Higher Output, Lower Upkeep!

Pioneer

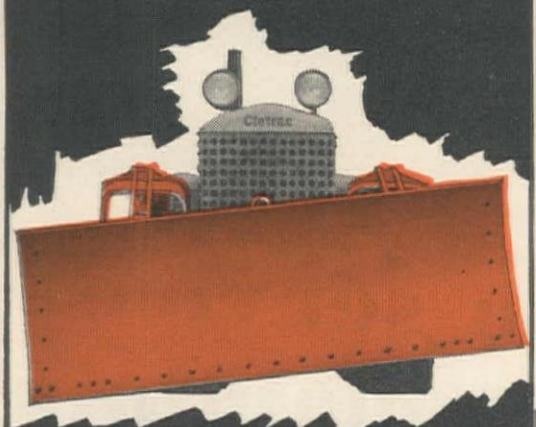
Continuflo **EQUIPMENT**

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

The DROTT TWINS join up

Now Your OLIVER Cletrac Dealer Brings You The

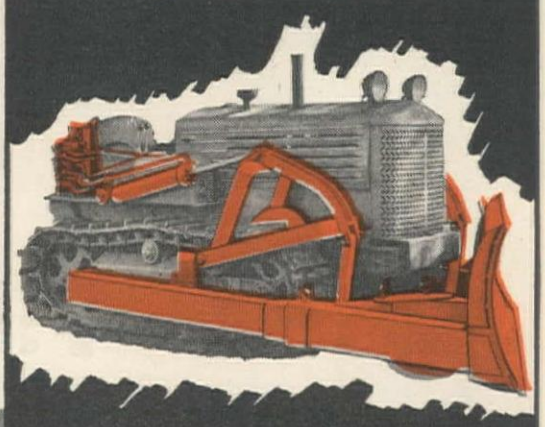
DROTT Twin-Controlled Tilting Bulldozer



• • AND • •

- Closed Hydraulic System
- Concealed Front Pump
- Independent Tilt — either side hydraulically raised or lowered from operator's seat
- Cradle Lift — simple, strong construction
- Blade close to radiator for better balance
- Clear Operator Vision

DROTT Twin-Controlled Tilting Bullangledozer

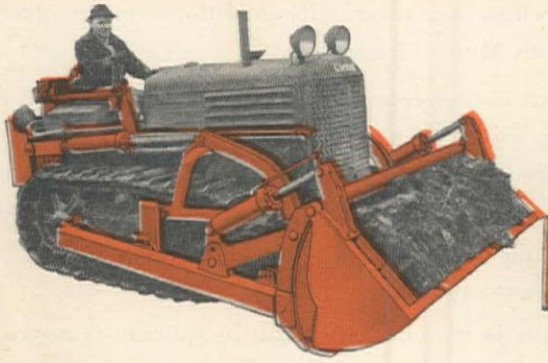


PROVEN PERFORMERS

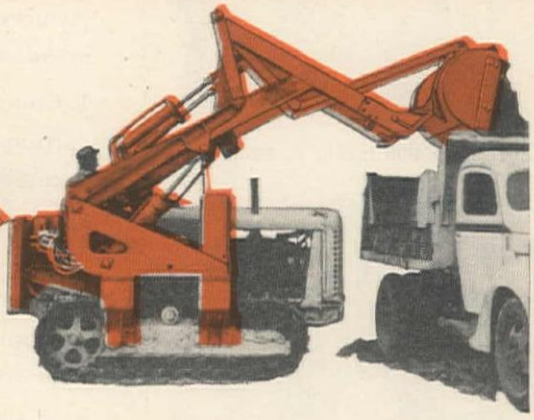
Long popular with and limited to Wisconsin and Michigan contractors, public bodies and loggers . . . now available everywhere through your OLIVER Cletrac dealer.

★ OTHER MEMBERS OF THE DROTT FAMILY AVAILABLE THROUGH YOUR OLIVER CLETRAC DEALER

DROTT Bullclam Shovel *and* DROTT Hi-Lift Loader



Ideal for building sanitary fills, digging basements, stripping — numerous excavating jobs. Digs, skids, dumps. Excavates evenly — you set depth of cut with depth gauge.



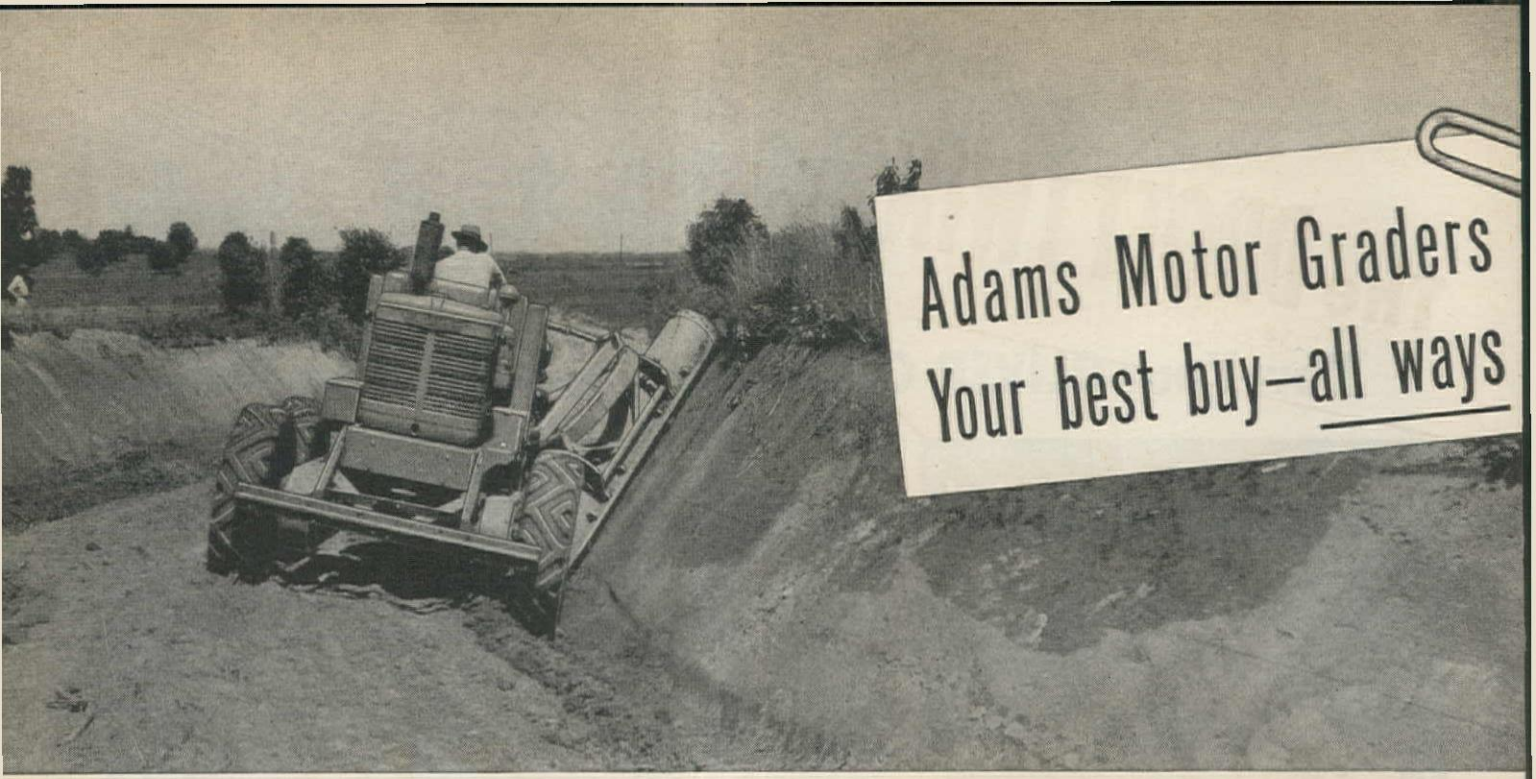
Extremely high lift and long reach; low overhead in digging position. Digs and crowds like a power shovel. Operator may dump all or any part of load. Power relatch of bucket.

Operated by DROTT POSITIVE CLOSED HYDRAULIC SYSTEM • SMOOTH • QUICK • DEPENDABLE. Keeps dirt and air out . . . keeps oil in! Used successfully on Drott equipment for many years.

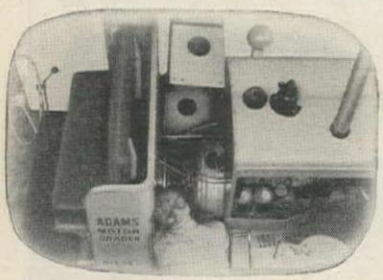
DROTT
UNIVERSAL EQUIPMENT

DROTT MANUFACTURING CORP.

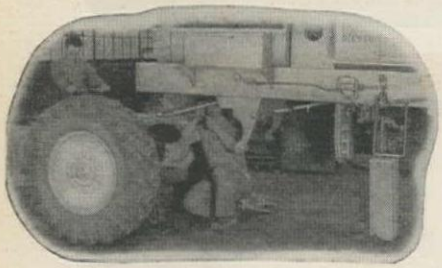
4362 N. GREEN BAY AVE. MILWAUKEE 12, WISCONSIN



Adams Motor Graders
Your best buy—all ways



1. Clutch easy to reach and service



2. Transmission readily accessible

3. Engine easily removed

Faster to service—
Easier to maintain

● Thoughtful engineering pays off in many ways to make Adams Motor Graders *your best buy—all ways.*

For example, Adams Motor Graders are engineered for fast, efficient, economical servicing—through and through. Note in the accompanying pictures how even the usually hard-to-reach assemblies are readily accessible in Adams Motor Graders:

1. Clutch is conveniently located between cab and engine—with plenty of room for servicing without disturbing the engine. Entire clutch assembly can be completely overhauled, *by one man,* in about 4 hours.
2. Transmission and lower half of engine are reached merely by disconnecting and backing out the final drive assembly. This is an unusually fast and easy operation.
3. Engine is mounted so it can be quickly removed from frame, when so desired. This feature frequently saves many in-the-shop hours.

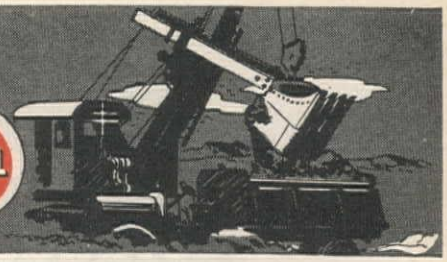
Yes, Adams Motor Graders are designed and built to spend fewer hours in the shop—*more hours on the job* . . . to do more work—*better, faster, cheaper.* Ask your local Adams dealer for complete information.

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

LOCAL Adams DEALERS

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

STANDARD ENGINEERS NOTEBOOK



Calol Pinion Grease sticks on open gears

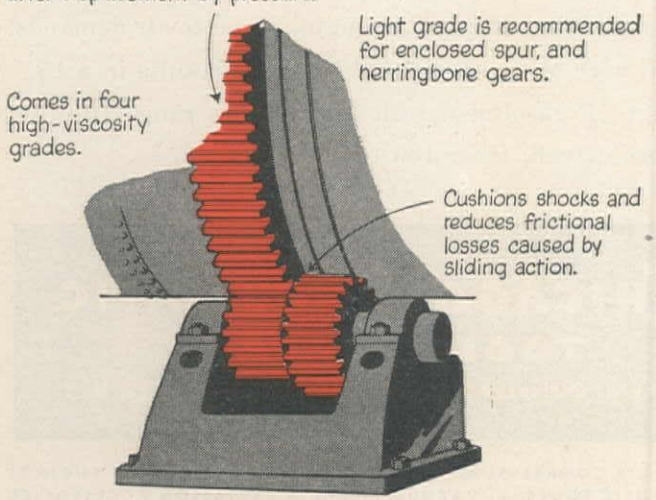
Because Calol Pinion Grease is extremely adhesive and flows back into place when displaced, it will not drip off and waste away from large open gears.

The tenacious lubricant film provided by this oil-like grease withstands high pressures and acts as a cushion under shock loads. It reduces to the minimum frictional losses caused by the sliding action of gear teeth and resists high temperatures.

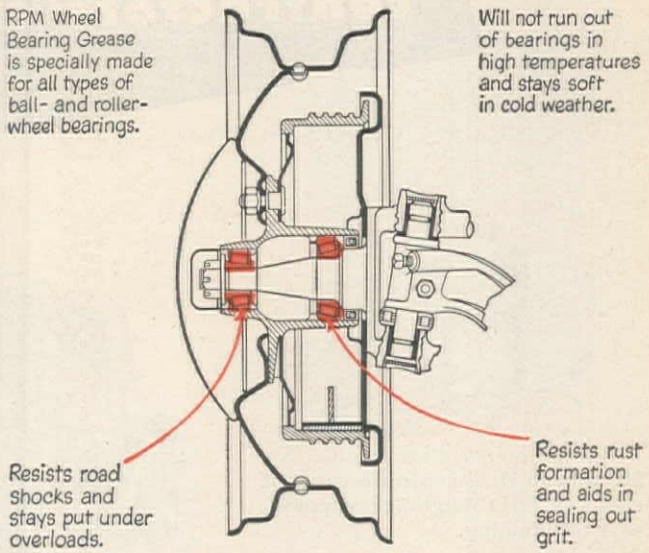
The lightest grade, Calol Pinion Grease 0, is particularly adaptable to open gears operating at high speeds. It is also recommended for grease-lubricated enclosed gears where climatic temperatures are low.

Calol Pinion Grease is also used on wire rope. In this use, the application should be as light as possible.

It comes in four grades: 0, 1, 2 and 5. The heavier grades are increasingly more adhesive. In some cases they require heating for correct application.



Section of Pinion and Girth Gears on Rotary Drier.



This drawing prepared with cooperation of Timken Roller Bearing Co.

Shock-resisting grease lengthens bearing life

To prevent extra wear and the necessity for replacing wheel bearings during the life of a vehicle, service them regularly with RPM Wheel Bearing Grease.

A short fibre lubricant, specially made for both ball, and roller wheel bearings, RPM Wheel Bearing Grease does not melt and throw out of bearings during hot operating conditions. It feeds slowly from bearing reservoirs and provides thorough lubrication for prolonged periods.

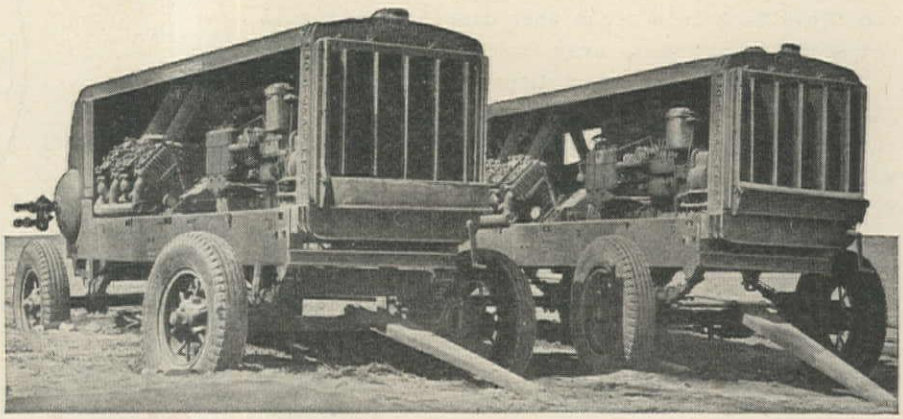
RPM Wheel Bearing Grease has the unusual ability of reducing the pounding of road shocks imposed on wheel bearings. It cushions the force of these shocks, minimizes metal fatigue and overheating and reduces vibration.

Extremely adhesive, RPM Wheel Bearing Grease helps maintain a seal around bearings against corrosive moisture. This seal also aids in keeping dust and grit out of bearings.

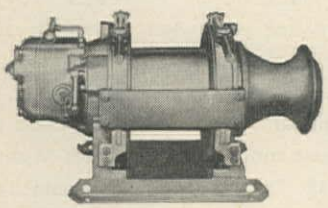
Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help — make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California

Save dollars by standardizing on CP contractors' equipment

For grout hole drilling, the CP No. 5 Diamond Drill is ideal because of its speed, light weight, great power, ease of handling.



CP-4 ring valve Backfill Tamper handles extra heavy work, such as tamping in earth dams.



CP Utility Winches, powered by air, electric or gasoline motors, are adapted for single or multiple line hoisting, spotting cars, moving timbers, handling structural steel, erecting machinery, etc.

If you have used CP equipment – portable compressors for example – you know they are efficient and dependable because of their superior design and rugged construction. You'll find this characteristic of the complete line of CP contractors' equipment.

One of the efficient features of CP Portable Compressors is the gradual speed regulator that adjusts the engine speed to air demands. This, in connection with other special CP features, results in a 15% to 35% fuel saving. CP gasoline-driven compressors range from 60 to 315 c.f.m.; Diesel-driven, from 105 to 500 c.f.m.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Distributors

WESTERN MACHINERY CO., 760 Folsom St., San Francisco, Calif., Phone: EXbrook 4167; WESTERN MACHINERY CO., 500 North 16th St., Sacramento, Calif.; Phone: 2-1211; WESTERN MACHINERY CO., 5722 So. Santa Fe Ave., Los Angeles, Calif., Phone: LOgan 3371; BALZER MACHINERY COMPANY, 2136 S.E. Eighth Ave., Portland, Oregon; WESTERN MACHINERY CO., N. 808 Division St., Spokane, Washington; HALL-PERRY MACHINERY CO., 812 E. Iron St., Butte, Montana; Lomen Equipment Co., Inc., Seattle-Alaska.

World's largest crane runway at San Francisco Naval Shipyards can hoist a million-pound load. Weight: 8,400 tons...Length: 730 feet (extends 162½ feet over water at each end)...Height: 209 feet.

Steel sinews that hoist million-pound loads

Jobs like this new Navy crane are unusual. But *"Steel by Columbia"* can be found in Western construction operations of all types and sizes. For steel is the one material that meets all requirements for all kinds of building. Steel structural members... steel doors, floors and ceilings... steel roofing and siding... all help get the job of building the West done, faster.

For information on the many building steels and steel products made by the great mills of United States Steel, contact the Columbia Steel Company office nearest you.

When you build...for today...for the future...BUILD WITH STEEL

A Partial List of U-S-S Building Steels

Plates Wire Rods Wire Rope Floor Plate Nails Structural Shapes
Reinforcing Bars Pipe and Tubing Sheet Piling Bearing Piles

Only STEEL can give you all 7 of these structural advantages

Extra toughness and shock resistance • Incombustibility • High strength-weight ratio • Highest modulus of elasticity • Versatility of application • Great durability • Ultimate economy.

COLUMBIA STEEL COMPANY

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

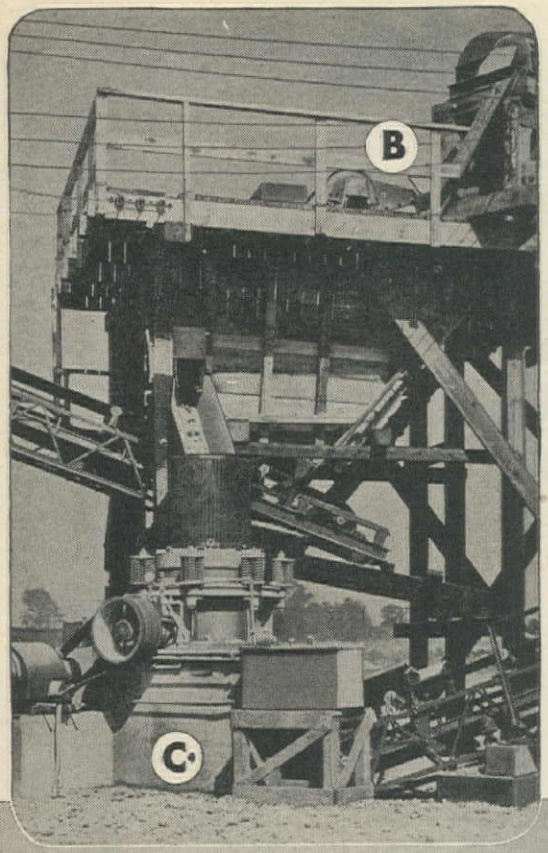
Pacific Coast Distributors for

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

United States Steel Export Company, New York

USS STEEL UNITED STATES STEEL

UNITED STATES STEEL



TELSMITH
designed and equipped

The Waupaca Sand & Gravel Co. plant at Custer, Wis., will handle about 175 tons per hour—producing concrete aggregate, 1½" to ¾"; ¾" to ⅜"; pea gravel and concrete sand. It is owned and operated by F. F. Mengel Co., Wisconsin Rapids, Wis.

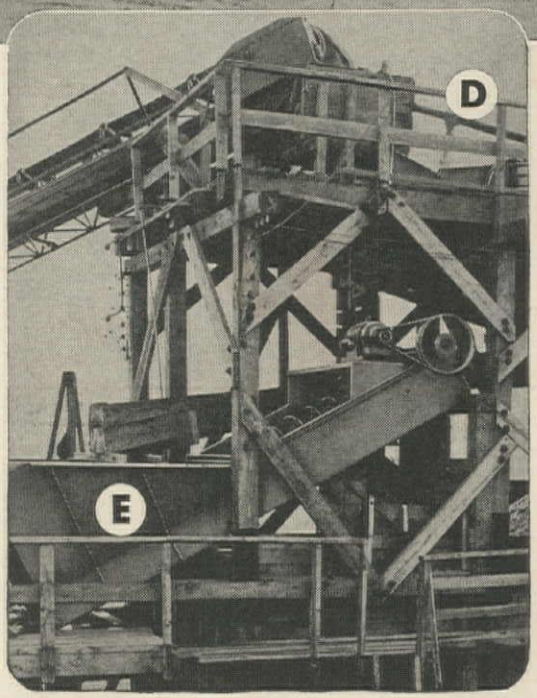
TELSMITH EQUIPMENT INCLUDES:

• (A) 30" x 5'-6" Special Plate Feeder • (B) 5' x 12' Single Deck Pulsator Scalper • (C) 28" Intercone Crusher • (D) 4' x 12' Triple Deck Pulsator • (E) 20" x 15' Twin Screw Sand Classifier • 24" x 203', 18" x 60' and 24" x 111' Belt Conveyors • Twelve Bin Gates

READ WHAT MR. F. F. MENGEL OWNER AND OPERATOR SAYS ABOUT TELSMITH COMPLETE PLANT SERVICE

"We wish to express our satisfaction with the gravel washing and screening plant you sold us. Each separate unit does exactly the work it was purchased for, with ample capacity and quiet running which makes for long life. Thank Elmer Kraig for the very fine drawings he made. We built each unit separate and when we set the conveyors and machines they were just where they should be with no changes necessary."

Telsmith's 40 years of engineering *know-how* is at your disposal. *Consultation without obligation.* Send for Equipment Guide G-30.



G-14

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

Mines Eng. & Eqpt. Co., 369 Pine St., San Francisco 4, Calif.

Garlinghouse Bros., 2416 E. 16th St., Los Angeles 21, Calif.

Lee Redman Equipment Co. Phoenix, Arizona

Clyde Equipment Co. Portland 9, Ore. Seattle 4, Wash.

General Machinery Co. Spokane 1, Wash.

Gordon Russell, Ltd. Vancouver, B.C.

This $500,000 picture needs $4,745 more . . . Do you see WHAT'S MISSING?

These floating derricks valued at $500,000 can't operate without the wire rope which is missing in the picture. It costs about $4,745 to equip the derricks with Preformed Wire Rope made of Improved Plow Steel. That's only $790 more than ordinary wire rope—and Preformed is far more economical.

When you buy any machine rigged with wire rope, make sure it comes equipped with Preformed. More and more manufacturers are standardizing on Preformed for their original equipment because it improves performance of their products. It's a money-saver because it lasts longer. It's easier and safer to handle.

Write for Free Copy of helpful book about Preformed. Address the Preformed Wire Rope Information Bureau, 520 N. Michigan Avenue, Chicago 11, Illinois.

Ask your own wire rope manufacturer or distributor

PREFORMED WIRE ROPE

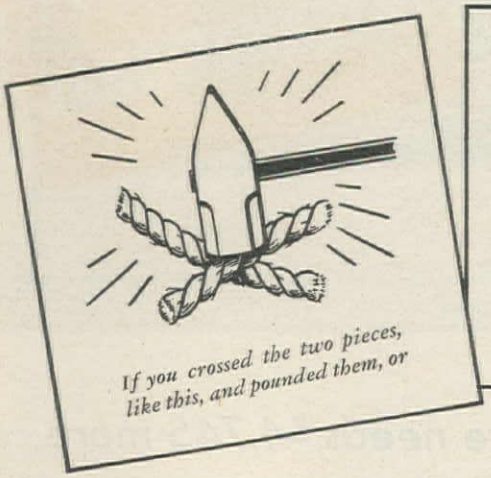
LASTS LONGER
HANDLES EASIER

UNITED STATES RUBBER COMPANY

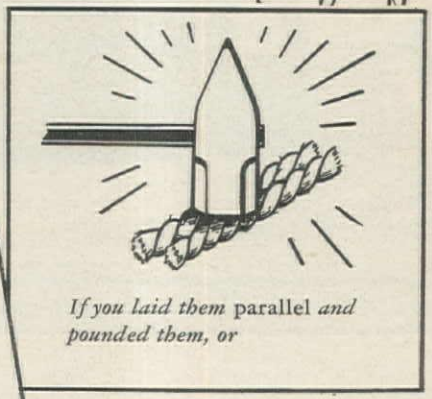
SERVING THROUGH SCIENCE

WE ASK YOU

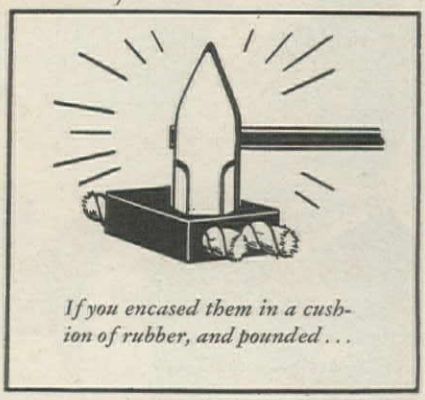
SUPPOSE YOU HAD TWO PIECES OF ROPE...



If you crossed the two pieces, like this, and pounded them, or



If you laid them parallel *and pounded them, or*



If you encased them in a cushion of rubber, and pounded . . .

Which pair would take the most pounding without breaking the strands?

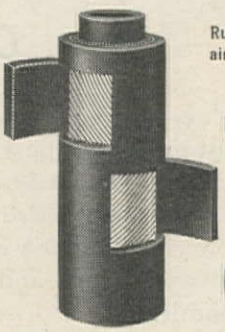
Common sense tells you the parallel-laid rubber-cushioned strands would stand up the longest.

That's the principle of the unique cord construction in both U. S. Royal Cord Air Hose and U. S. Peerless Compressor Hose. In all the pressure-resistant plies, each of the cords is rubber-cushioned, and no cord touches another. This avoids any shearing action when the hose undergoes contraction, expansion, and flexing in service.

No wonder more and more contractors are specifying Royal Cord Air Hose or Peerless Oilproof Compressor Hose on construction and quarry jobs.

Available at your equipment distributor or the nearest branch of United States Rubber Company.

The Unique U. S. ROYAL CORD CONSTRUCTION



Rubber Tube compounded for air conditions.

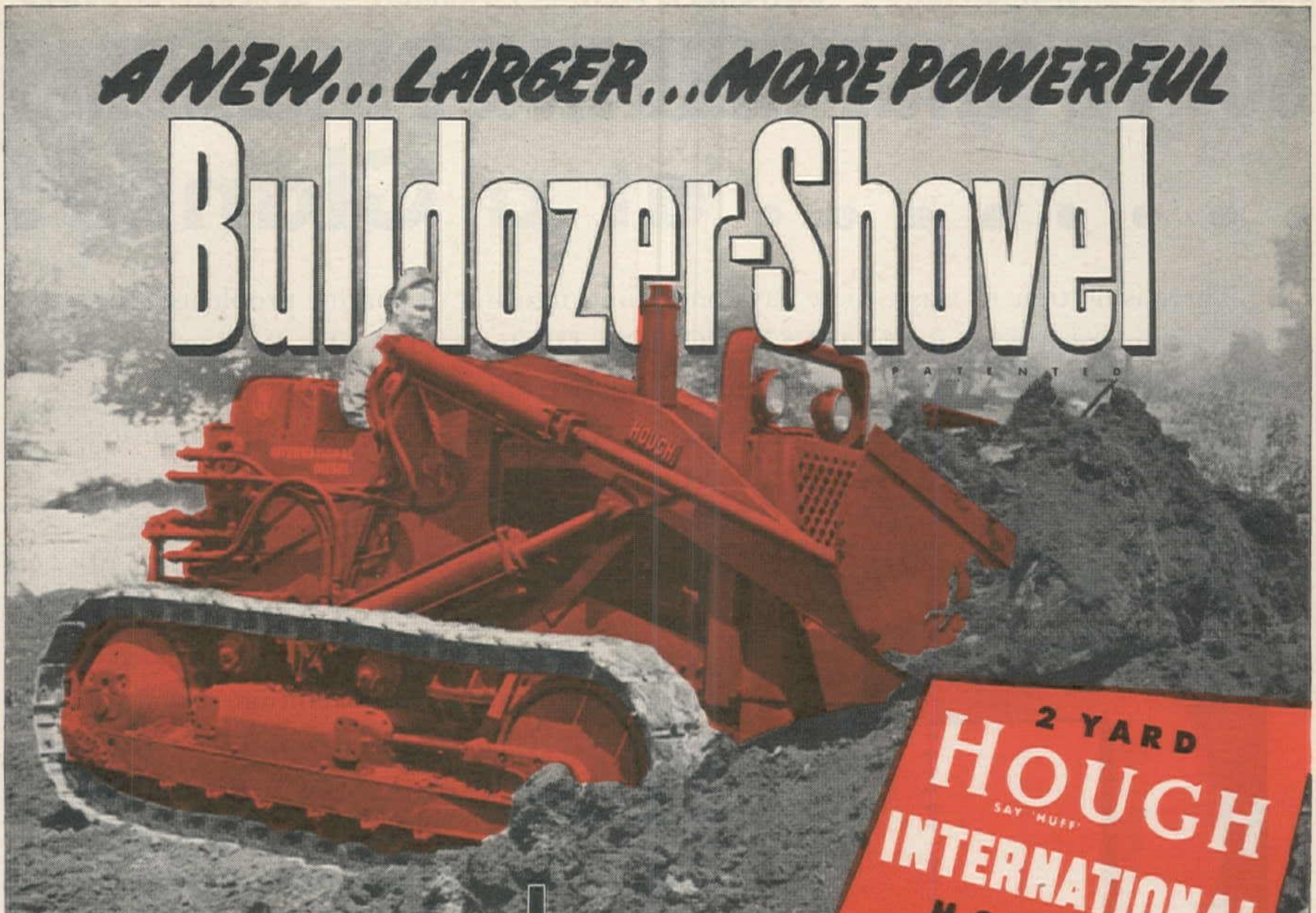
All cords in all pressure-resistant plies laid parallel (not-crossing) each in a cushion of rubber, for protection against bruising—no shearing is possible under expansion, contraction, and flexing.

Tough, thick, wear-resistant cover.

IF HOT OIL VAPORS ARE PRESENT, use Peerless Compressor Hose. Same cord construction with special synthetic rubber lining oil cannot ruin.

U. S. ENGINEERED RUBBER PRODUCTS FOR THE CONTRACTOR

Air, Water, Steam, Suction Hose · Belts · Packings · Tape



OSCILLATING TRACKS

Tracks are not "tied-down" but oscillate freely as in normal tractor operation. Means better traction — and level cutting edge at all times.

TIP-BACK BUCKET

Bucket tips back automatically in carrying position to prevent spillage. Also assures full bucket capacity and better cutting action in digging range.

HYDRAULIC BUCKET CONTROL

Bucket is dumped and returned by hydraulic power. Reduces operator fatigue, eliminates maneuvering to close bucket, relieves tractor and vehicle being loaded of shocks.

DOWN PRESSURE

Double acting rams permit tractor weight to be applied to Bucket or Bulldozer cutting edge, for easier penetration into hard materials.

Here is a *real* Tractor Shovel, the outstanding machine in the 2 yard class. From its long, ground gripping tracks on up, it's every inch a superior unit — built to deliver more yardage, consistently, over an extremely wide range of Shovel or Bulldozer work.

Built into the powerful TD-14 International Diesel the Hough Bulldozer Shovel provides full visibility in every direction: tractor frame mounting to permit free track oscillation: lowest over-all height; automatic TIP-BACK Bucket; simplified hydraulic control; hydraulic Bucket control; powerful crowding action coupled with positive hydraulic down pressure. Compare before you buy — do you know of any other unit that gives you all these features?

The Model 14 "packs a mighty wallop" — its a big machine, with plenty of weight for traction; plenty of power for tough going, built long, wide and low for greatest stability and maneuverability. Over 25 years of engineering experience in building thousands of Tractor Shovels is engineered into the Model 14. For complete details see your International-Hough industrial distributor today!

PROVEN OVER 6500 HOUGH TRACTOR SHOVELS BUILT PERFORMANCE

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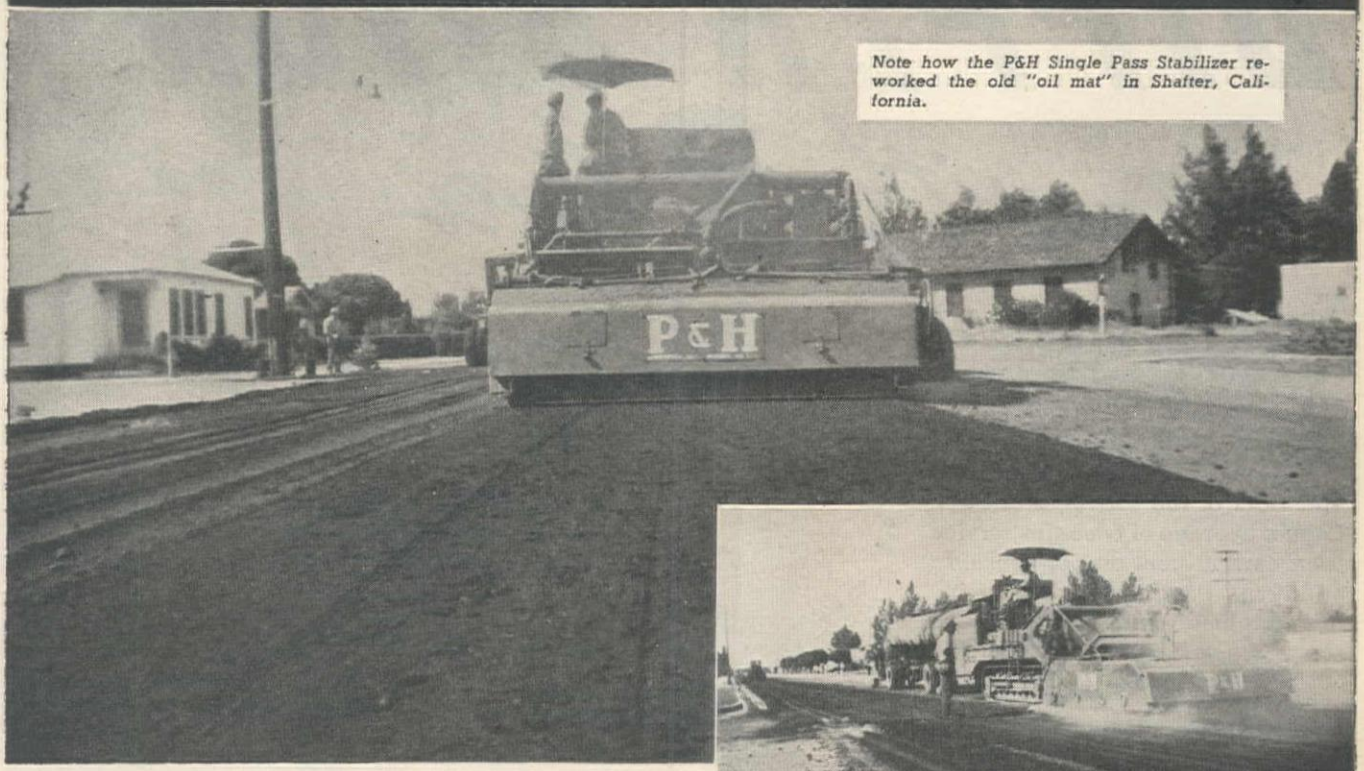
NEW METHOD OF REWORKING "OIL MAT"

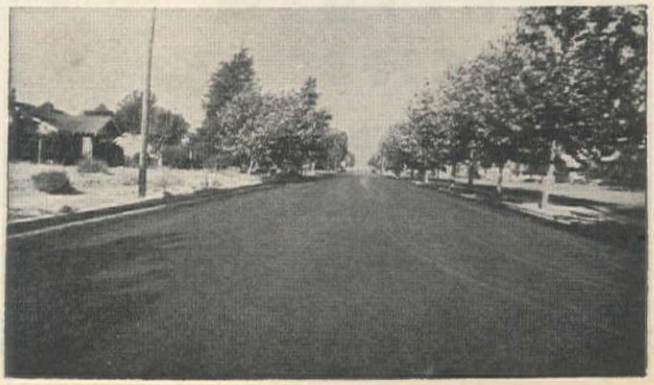


Note how the P&H Single Pass Stabilizer reworked the old "oil mat" in Shafter, California.

▲ *Here the processing went to a depth of 3½ inches at a rate of 1000 sq. yds. per hr. Many days the rate increased to 1200 sq. yds. per hr.*

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

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



P & H STABILIZER

DOES IT—*IN A SINGLE PASS!*

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

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

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

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

P & H

SINGLE PASS STABILIZERS

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DIPPER STICK *with 3 lives*

The Mayari R, two-part dipper stick on this 13-cu yd shovel has lasted three times as long as previous sticks made from ordinary carbon steel.

Midwest Radiant Corporation, operators of the shovel, were getting an average of 6 months service from carbon-steel dipper sticks. In addition, they were frequently forced to halt operations and make repair welds.

In January, 1946, Midwest switched over to Mayari R. Their first dipper stick made from this low-alloy, high-strength steel is still in operation after more than 18-months service. It weighs the same as the carbon-steel sticks—yet it has developed no fractures and has required no repairs since it was installed.

This is another case where Mayari R shows a distinct advantage and considerable savings over ordinary materials. Mayari R is a versatile steel, well adapted to use in many types of equipment where high strength, weight-reduction and resistance to atmospheric corrosion are important.

For further information regarding Mayari R, write for catalog 209.

Bethlehem Pacific Coast Steel Corporation

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

BETHLEHEM PACIFIC

★ BETHLEHEM STEEL ★

13-cu yd shovel with Mayari R dipper stick. This stick has been in operation for more than 18 months and has required no repairs.

Mayari R *makes it lighter... stronger... longer lasting*

AGAIN THIS WINTER MORE FWDs MOVING MORE SNOW

When an FWD-powered plow busts into a snow bank, it has the driving-force to go through because it has FWD power and traction on all wheels. With all types of snowplows, FWD four-wheel-drive trucks have proved their value in snow removal, opening streets and highways fast, keeping them open for traffic that must be kept moving.

On many other tough jobs of highway maintenance, FWDs are just as outstanding as they are in snow-fighting. For dependable, all-season, heavy-duty truck service, see your nearest FWD distributor, or write to

THE FOUR WHEEL DRIVE AUTO CO.
Clintonville, Wisconsin
Canadian Factory: Kitchener, Ontario
WORLD-WIDE SALES and SERVICE

Photo above: FWD Model M7, with snow plow • Photo at left: With 400 miles of road to clear in Michigan's worst snow belt, this FWD Model SU plowed snow all winter . . . more than 100 inches snowfall, officially, up to March 1, for the 1946-47 winter!

FWD

America's Foremost Heavy-Duty Truck

TOO MUCH TO DO...

...AND TOO LITTLE TIME TO DO IT?

GET A

SEAMAN *Mixer*

It's widely granted that the SEAMAN is highly versatile in the solving of road-mix problems, — turning out, even under adverse conditions an intimate, homogenous mix with perfect control of voids. It's an accepted fact that for the SEAMAN, mixing for all types of bituminous construction is as easy as for soil-cement, clay gravel, sand-clay or any form of soil stabilization. It's known that the SEAMAN has many other applications valuable to the road builder's work so that even apart from mixing, the SEAMAN can be kept busy day in and day out. Now add to those reasons the fact that it is lower in cost and faster in production and you'll see why time-pressed contractors turn to the SEAMAN to decrease shut-downs and increase output during every working day.

And remember, the SEAMAN, used in conjunction with certain conventional mixing plants will as much as double the daily output.

Auxiliary Spray Bar and Pumping Unit

For Positive Control of Moisture. In soil cement, or any soil stabilization process and in earth work compaction, — control of the moisture increment must be positive to obtain optimum content efficiently. The SEAMAN SPRAY BAR and PUMPING UNIT, mounted on the MIXER chassis, introduces the water into the rotor chamber. Evaporation or migration losses of the water are eliminated. Further, only transfer trucks need be used for water transport. Saves equipment, saves labor, saves trips.

More Economical for Oil. Many of the same benefits of the SPRAY BAR and PUMP prevail in its use in oil application. With the oil introduced into the rotor chamber the binder is in process immediately and the mix is in positive control of the operator until completion.

Going as strong as ever, the famous booklet, "Soil Stabilization Methods", compiled by Seaman Engineers, is yours on request. Handy, practical, filled with job facts and modern procedures. Ask for Bulletin—N-25.

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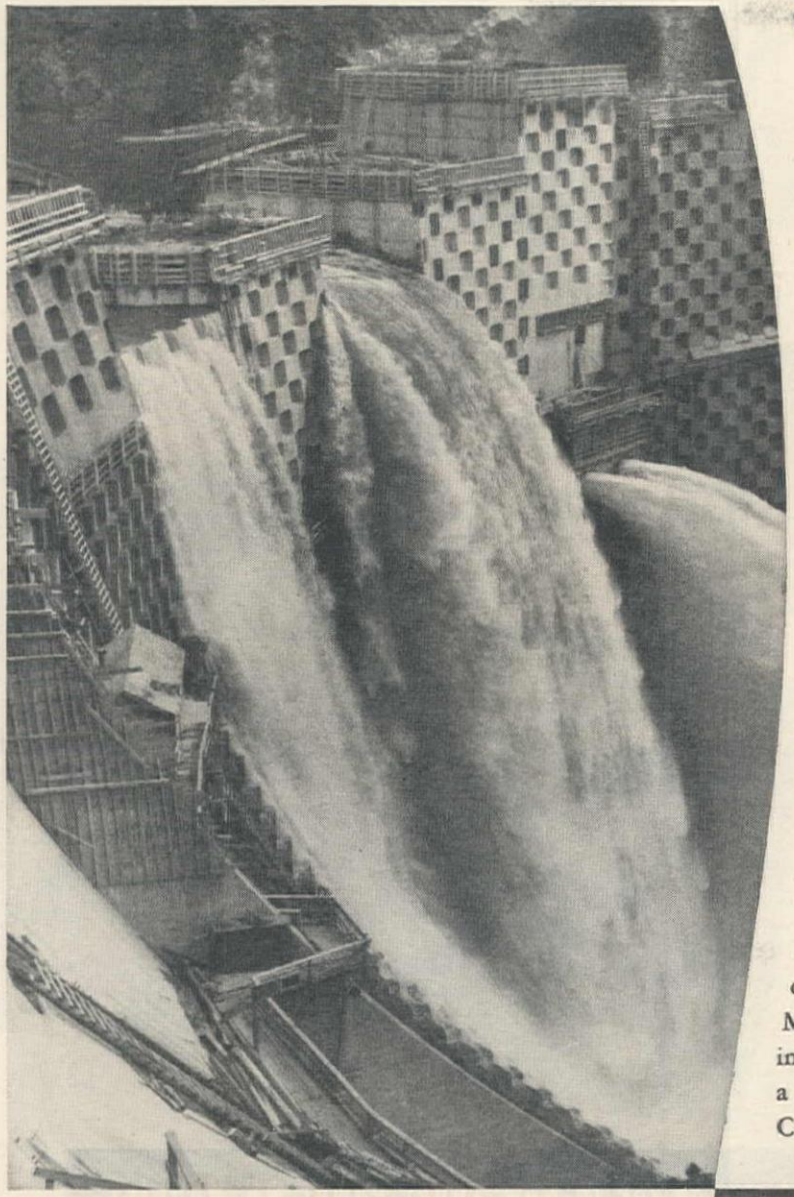
for ten years General Petroleum helps build



"City Light"

Ross Dam, nearing completion as the keystone of Seattle's municipal power system, is one of the most spectacular and difficult engineering achievements in western history. When the third step towers 540 feet above bedrock it will impound 1,400,000 acre feet of usable water, and produce 700 million kilowatt hours annually.

This tremendous job of harnessing the Skagit river was started in 1937 and will be completed next year. The project is unusual in that it is not a trucking or hauling operation. All gravel, cement, steel and other materials are railroaded to the base of Diablo Dam, and then hauled up an almost vertical canyon wall, to be moved by barge and tug boat up Diablo Lake to Ross Dam.

Mobil lubricants have been used for ten years on this "City Light" project, by General-Shea-Morrison, contractors. All the equipment, including the lake tugs, are lubricated from a schedule prepared by General Petroleum's Contractors' Service.

G. P. service, including a survey of equipment, recommendations of lube products, delivery and inventory control, and close supervision of machinery requirements, may be equally important on your jobs. Let us give you complete information on the G. P. Contractors' Service.

GENERAL PETROLEUM CORPORATION

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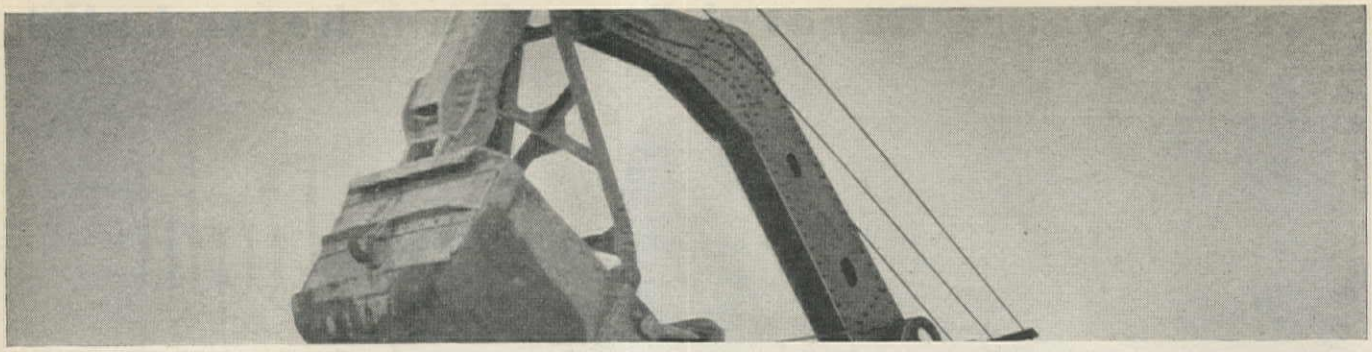
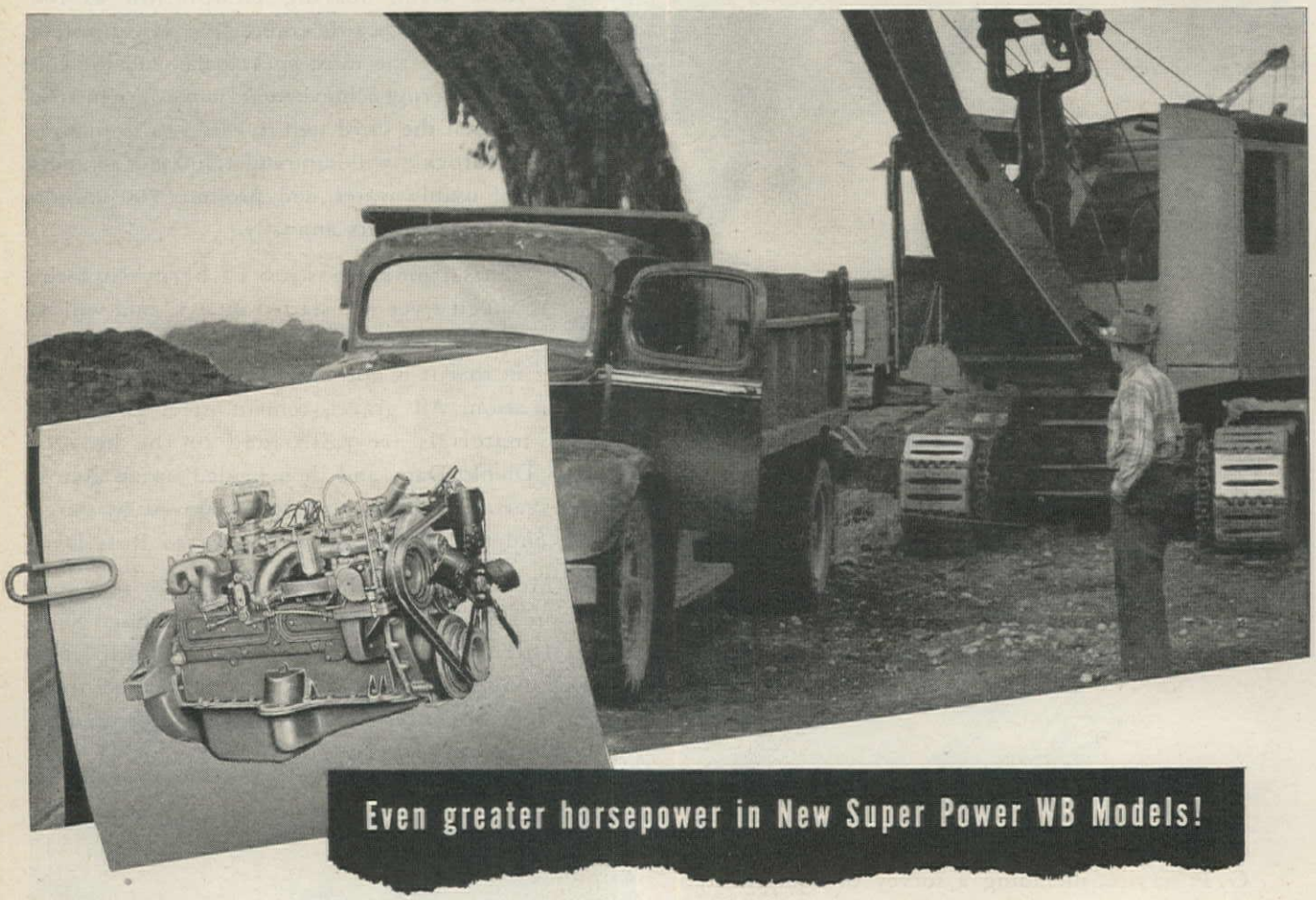


WHITE has made an important addition TO THE CONSTRUCTION PICTURE!



Even greater horsepower in New Super Power WB Models!

After ten years and millions of miles of rugged, low-cost operation, White Super Power engines now add even greater performance in the new WB Models. Continued research has given White Super Power higher horsepower per cubic inch of displacement than ever before! Other outstanding engine features include sodium-cooled stellite-faced valves, dual carburetion, scientifically metered intake manifold for uniform fuel distribution, plus many others. *White Super Power's superior ability to do an outstanding job at below average cost is proved time after time—year after year.*

White

THE WHITE MOTOR COMPANY • CLEVELAND

Pacific Coast Branches and Dealers in all the important cities

FOR MORE THAN 45 YEARS THE GREATEST NAME IN TRUCKS

THE A. B. C.
of ATLAS
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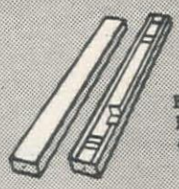
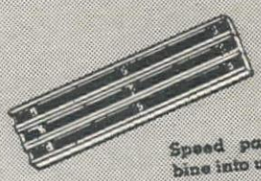


Basic unit, the Speed Panel, made of rugged steel.

Ingenious, quick-action, wedge bolt, for rapid joining or stripping.



Speed panels combine into units of two or more for quick handling.

Forms are quickly and easily positioned for floors.

Light and sturdy. Easy wall assembly. Rapid stripping.

Forms assembled into multi-unit panels for rapid crane handling.

They had cheap labor and plenty of wood...

But they sent ATLAS STEEL FORMS to OKINAWA

Wood was cheap and plentiful, native labor was freely available, and yet for Army construction on Okinawa they brought Atlas Speed Forms all the way from the States. The Okinawans quickly learned to assemble and strip the simple Atlas Speed Forms, a minimum of stateside labor was involved, which drastically reduced labor costs.

Whether the concrete is poured in Oklahoma or Okinawa, on the East Coast or in the Far East, Atlas Speed Forms will reduce form costs and form labor costs in half, and speed up the completion of the job. For more details, ask an Atlas engineer—fill out the coupon below.

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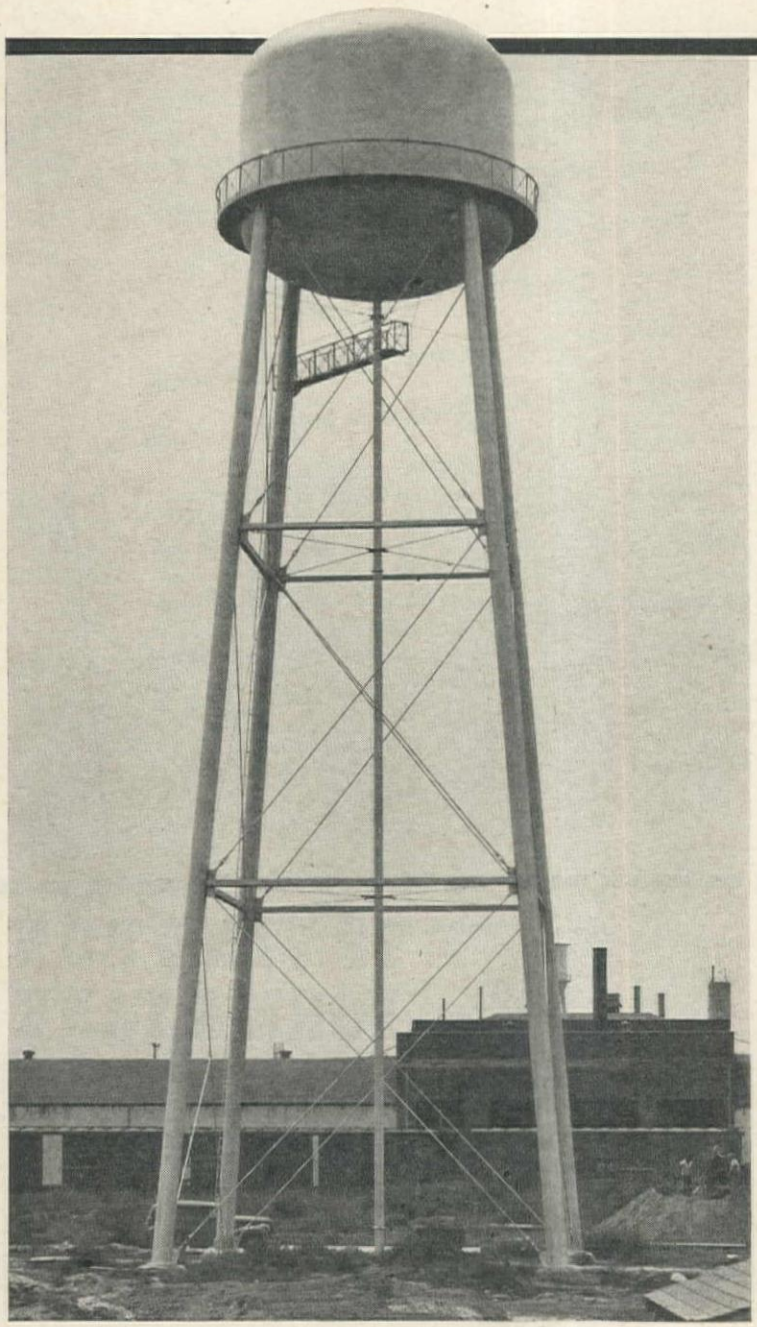
"your main line of fire defense

. . . since their first appearance in industry back in 1875, they (automatic sprinklers) have done more to protect property and employees' lives against fire than any other single factor. The reasons are simple. Sprinklers are always 'on guard,' ready to go into action whenever fire starts. They strike at the seat of the fire undeterred by heat or smoke. They cover the entire burning area. They eliminate unnecessary water damage because only the sprinklers which are needed are open . . . Sprinklers have prevented countless fires from reaching destructive proportions, and many times they have meant the difference between a few minutes interruption and a costly shutdown."

Reprinted from a recent article by the Associated Factory Mutual Fire Insurance Companies.



. . . . . AND HOW TO "BACK IT UP"

WITHOUT a *dependable* supply of water available at all times, an automatic sprinkler system is of little use. One way to be sure that water will be available is to provide a gravity supply in a Horton elevated steel tank.

Some engineers provide two or more independent sources of water for a sprinker system. The primary supply maintains pressure on the system under normal operating conditions, while the secondary supply is available to maintain protection when the primary supply fails temporarily, is overtaxed during a severe fire or the pressure drops below the required minimum.

Public water systems are often used as the primary supply with an elevated tank for the secondary supply. Where there is no public system or the pressure is inadequate, an elevated tank is used as a primary supply. A suction tank with a fire pump may then serve as a secondary supply.

The 100,000-gal. Horton elevated tank shown at the left is used as the secondary water supply for the automatic sprinkler system at the Ford Motor Company's Los Angeles, Calif., assembly plant. A 500,000-gal. reservoir, which is filled by the municipal water system, provides the primary water supply.

Horton elevated tanks for automatic sprinkler systems are built in capacities from 50,000 gals. to 250,000 gals. Write our nearest office for quotations stating capacity required and height to bottom.

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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
November, 1947 Vol. 22, No. 11

Lumber for Europe

BELIEVE IT OR NOT, the Export Control Branch of the Department of Commerce is actually considering a proposal to completely eliminate export controls on all Southern pine lumber and a proposal on fir and other West Coast woods involves complete decontrol. Another proposes taking export controls off grades No. 1 common and lower. The current high prices of lumber would be just the beginning of the altitude they would reach if the Review Committee decides to approve these recommendations.

The National Retail Lumber Dealers are vigorously protesting to W. Averill Harriman, Secretary of Commerce, and to their Senators and Representatives. They are advising them that, with dealer inventories of common items only about 70% of normal and inventories of uppers and finish items only 25% of normal, it would be disastrous to relax lumber export controls or increase lumber export allocations. Home builders are equally concerned with the calamitous effects on both supply and price if the Secretary accedes to the pressure for increased foreign shipments.

—National Association of Home Builders.

What Price Safety?

THE BUDGET of the U. S. Department of Labor for accident prevention is $40,000 per year, which is less than one-tenth of one cent for each worker in the country. There is even some thought of doing away with this insignificant pittance, "in the interest of economy."

If that is all our Congressmen and Bureaucrats are willing to devote to accident prevention on a national scale, it is no wonder that accident fatalities increased 4 per cent in 1946 over 1945. The total reduction in accident fatality rates throughout the country was only 14 per cent from 1901 to 1946, a fact which seems to indicate that the country as a whole is learning practically nothing about how to prevent accidents. The safety engineer who could not show at least that much improvement for each of four successive years in a given plant or construction job should have a hard time explaining why he is being paid for his services.

It is true, of course, that practically every important concentration of workers has a safety program and safety inspectors and practically all the credit for the 14 per cent reduction mentioned above must be given to these activities by private enterprise. But the formulation of adequate safety rules in all walks of life and business, the promulgation of safety education and the training of safety specialists is of so great importance to the nation as a whole and every one of its citizens that direction and sponsorship might well come in a significant amount from the federal government. The sum of $40,000 annually is so paltry as to be almost humorous, except for the fact that the problem is anything but humorous.

Natural Resources

DOES ANY natural resource have worth except for the application of man's genius? "Natural resources belong to all the people" say the unthinking, thereby implying that no man has a right to apply his ingenuity "profitably" to natural resources. His ingenuity brought man out of the cave into the adobe, the log cabin and on into the most fastidious electric-appliance equipped modern home. Electricity is one of the fundamental qualities of nature, like the carbon in coal, oil, and natural gas. It took an Edison to discover ways of capturing its magic usefulness. No one has ever been able to define electricity much less "own" it. But billions upon billions of dollars are "profitably" employed in applying it to man's benefit. The means of utilizing natural resources are not inherently "common property."

—Natural Resources News

Parking—A City's Headache

STREETS AND HIGHWAYS are channels over which move people and goods. Providing these channels of freight and travel is the responsibility of the community. But the obligation of the community to its motorists does not end there. Adequate parking space should also be available. When it is not, parking becomes a major problem.

Joe Doakes' lament that he cannot find a place to leave his jallopy downtown is being multiplied into a roar that is deafening traffic engineers. Forward-looking cities are giving the matter careful attention and are finding a way out. Those that are sidestepping the issue will find that it can never decide itself. The American Road Builders' Association feels that it can be solved, but it will require sound study, plans and concerted action.

With a steadily increasing volume of traffic, street parking is on its way out and rightly so. It is illogical to provide a four-lane street and then shut off two lanes with parked cars. Moreover, both sides of a street can accommodate only a very small fraction of the car owners who would like to park there.

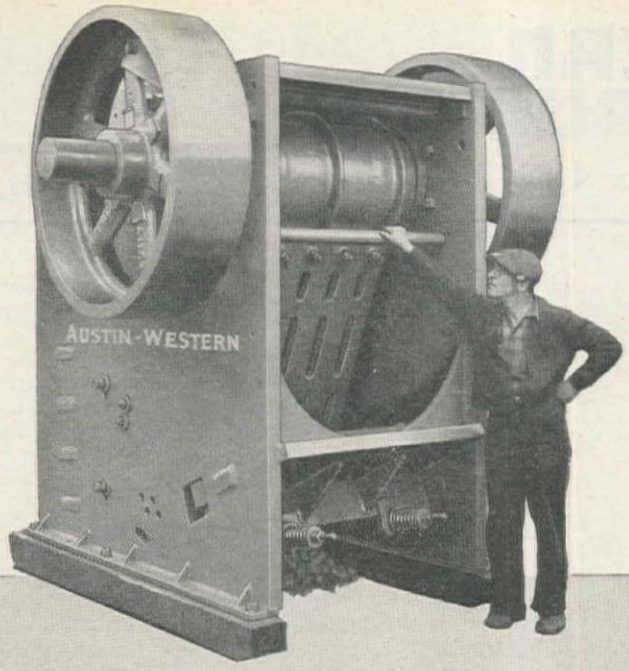
Chaotic parking conditions are costing the community a lot of money. Studies of decline in value of business district property reveal some arresting figures. Slumps in eight cities of half a million population and over amount to some 20 per cent of the total value in a ten year period. The same ratio of decline obtained in cities under 50,000. Between 1930 and 1940, the decline in downtown values in a city of 300,000 is computed at approximately $5 million annually.

The reason for this is not hard to find. Retail trade is leaving the central business areas for outlying shopping districts which are accessible to automobiles. Some of these trading centers are outside the city limits and pay no municipal taxes. Because of this, they are well able to compete with downtown stores on a price as well as a parking basis.

With motorists condemning the lack of free parking space and the high cost of parking, business grieving over its loss of trade, and municipal officials concerned with the traffic snarls, bottlenecks and hazards to which the parked car contributes, it is understatement to say that parking is a city's headache. It is something that requires a major operation to alleviate.

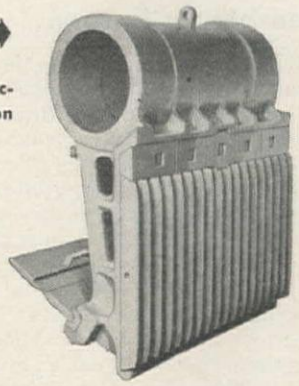
Shooting the Clouds

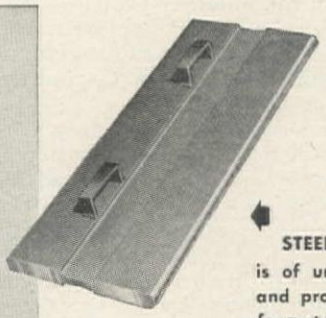
MAN-MADE RAIN recently offered relief to water-hungry Arizona farms and industry. "Dry ice" pellets shot from a transport airliner on cumulus clouds in the Eastern Arizona sky succeeded in precipitating thousands of tons of water in the watershed of Roosevelt Dam. It was the first attempt to utilize in the arid desert a technique for precipitating moisture out of clouds developed only last winter by Vincent J. Schaefer, scientist of the General Electric Co. If this thing works out, a new complication may be added to the already confused question of water rights in the West. "Capturing" water on the wing, as it were, like shooting wild geese, would surely be federal business and might be the last straw in robbing the states of control over water.



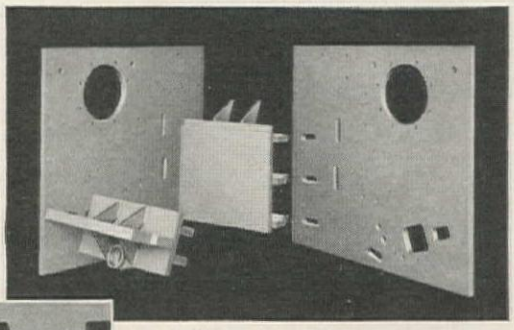
These are the Things that *Boost* Production

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

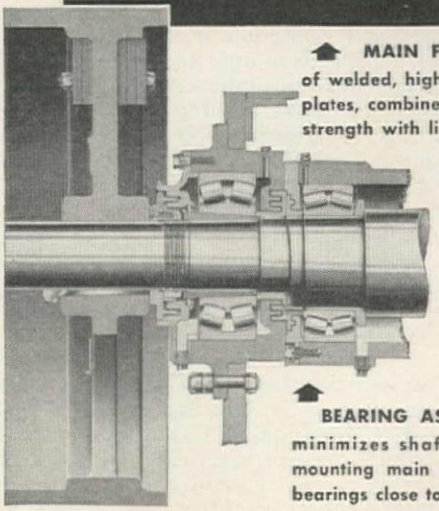




STEEL TOGGLE
is of uniform width, and proper and uniform strength.



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



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

• 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.

Bulletin 1960 tells the whole story. Your nearby A-W distributor will be glad to send you a copy.

AUSTIN-WESTERN COMPANY
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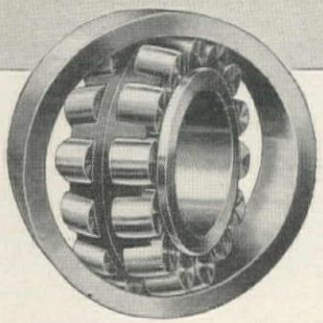
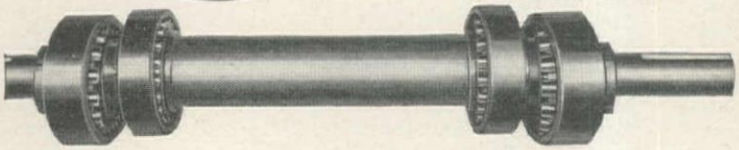


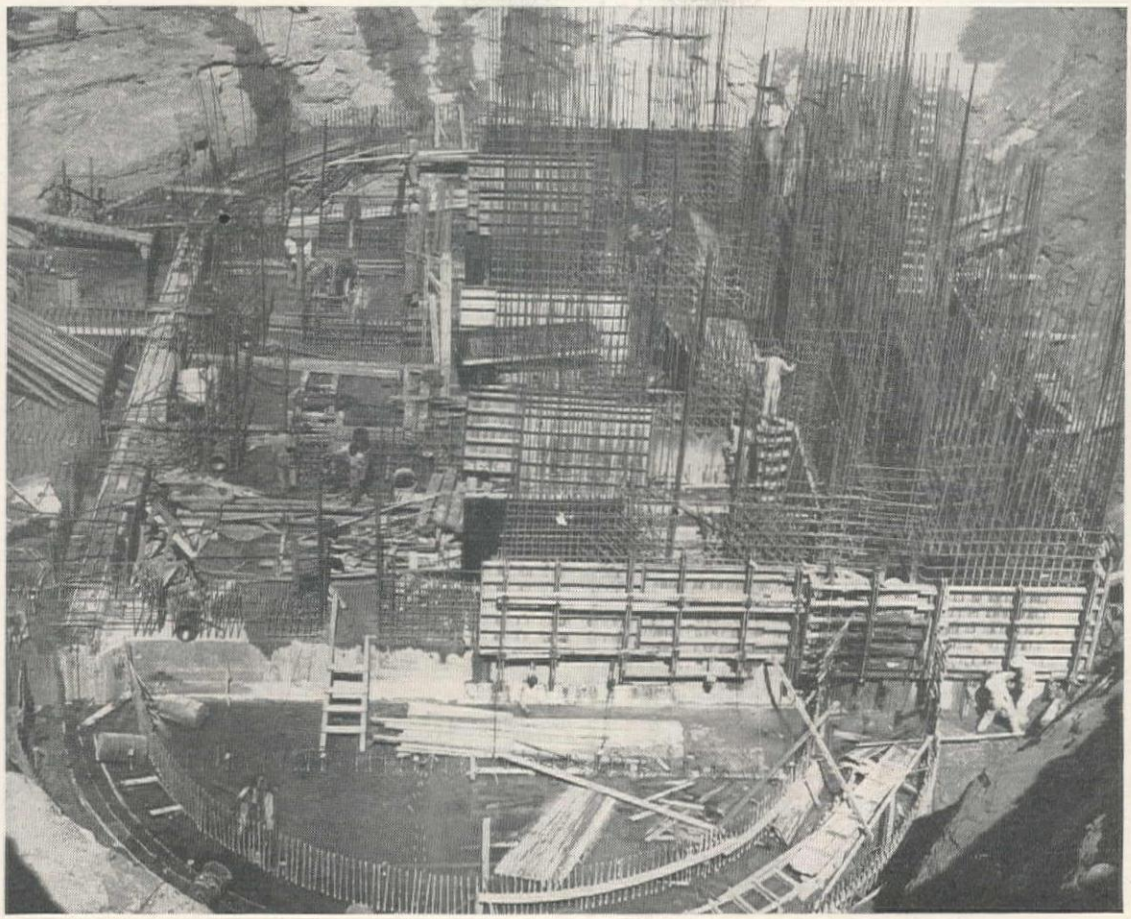
S.K.F. BEARINGS
of self-aligning type, protect load-bearing surfaces.

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



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

WESTERN CONSTRUCTION NEWS
NOVEMBER • 1947



Colorado-Big T—
Construction of Granby Pump Plant

Vital unit which will lift Colorado River water to elevation required for delivery to portal of Adams Tunnel under construction simultaneously with Granby Dam — Contract includes pumphouse founded deep underground, intake and outlet structures, and canal to Grand Lake — Maximum lift of three centrifugal pumps to be 186 ft.

GRANBY PUMPING PLANT, the key operating heart of the Colorado-Big Thompson project, presently under construction at an accelerated pace by the Bureau of Reclamation, is being built by a joint venture contracting firm known as Granby Constructors, which has Schedule I of the contract, for the pumping plant proper, and Vinnell Co., Inc., which holds Schedule II, the pump canal. Both contracts were awarded in April of this year.

The Colorado-Big Thompson project is designed to transfer surplus flood waters of the Colorado River, which flows on the Pacific slope of the Rocky Mountains, through a mountainous area of western Colorado where there are only negligible areas available for irrigation, through the Continental Divide to the watersheds of the Big Thompson, Cache la Poudre, St. Vrain, and Boulder Rivers, all tributaries of the South Platte River, where 615,000 ac. of rich farm land now suffering from acute water shortage can be immensely benefited.

To accomplish this end, Granby Reservoir is being constructed 6 mi. northeast of the town of Granby to store flood waters from the headwaters of the Colorado River. It will be the second largest body of water in the state, having a capacity of 546,000 ac. ft. Water from this lake will be raised to a maximum of 185 ft. to Shadow Mountain Reservoir, which is an enlargement of Grand Lake, formed by construction of Shadow Mountain Dam (*Western Construction News*, Dec., 1945). This latter reservoir is to be held at virtually a constant level, and from it water will flow into the 13.1-mi. Alva B. Adams (Continental Divide) Tunnel, through the Rockies to emerge near Estes Park on the East slope. (*Western Construction News*, Dec., 1940; Feb., 1944; Jan., 1946.) Also a part of the West slope work is construction of Green Mountain Dam on the Blue River, a Colorado tributary, which catches flood waters of that stream and releases them throughout the year to compensate for the water diverted through the tunnel. (*Western Construction News*, Mar., 1941; Dec., 1943.)

On the East slope of the Rockies, the water passes through a whole series of power drops, siphons, tunnels, reservoirs, and canals until it finally reaches the

EXCAVATION for Granby Pump Plant is in sandstone on the left bank of Soda Creek, about 115 ft. deep and 700 ft. in from the stream. When building and intake structures are built in this excavation, they will be backfilled with excavated material which has been stockpiled for the purpose. Contractor's yard is on top of hill.

irrigable land in the South Platte basin. Currently under construction on the East slope are the Aspen Creek siphon, Ramshorn and Prospect Mountain tunnels, Estes Park Reservoir, Horsetooth feeder canal, and Horsetooth Reservoir (*Western Construction News*, Oct., 1946). These are all portions of the distribution and power generation system. Eventually the water will pass through seven power plants on its course down the mountains, with a generating capacity of over 700,000,000 kw. hr. of electrical energy annually.

Although the works below the Adams Tunnel are not complete, about 200 cu. ft. per sec. of water are now being diverted through the Adams Tunnel from Grand-Shadow Mountain Reservoir, but at the discharge end of the tunnel it is being carried through a temporary conduit to benefit farmers in a district in the immediate vicinity of Estes Park. The water is being withdrawn from the natural flow into Grand Lake, since both Granby Dam and Granby Pumping Plant are only in the construction stage and are not ready to supply pumped water to the upper lake.

Pumping plant

The pumping plant proper will be housed in a reinforced concrete structure founded deep in the ground, and will consist of three 200-cfs. vertical-shaft single-suction centrifugal pumps operating under a variable head from 96 to 186 ft., each powered by a 6,000-hp. electric motor, three reinforced concrete conduits, intake structures, three steel outlet pipes encased in concrete, surge tank, a reinforced concrete discharge line 3,400 ft. long, and an outlet structure. These items, with incidentals, compose Schedule I of the contract.

The overall ground plan of the pumping plant measures 125½ ft. by 59½ ft., not including the bays for inlet and discharge conduits. The structure is composed of three central rectangular chambers, each containing one complete pumping unit, with gages, valves, drains, and operating controls. The semi-circular longitudinal extensions of the building will house elevators, stairs, unwatering pumps, and other accessories.

The building will have a total height of 174.50 ft. from the floor of the pump chamber. The upper 50 ft. of this will extend above the surface of the ground and will house a 50-ton travelling crane to handle maintenance of the pumps and motors. Intermediate floors in the structure will house a 25-ton crane, storage space and working rooms.

The plant is being constructed in an excavation approximately 115 ft. deep in the left bank of Soda Creek, a tributary which will be entirely inundated by Granby Reservoir, and approximately 700 ft. into the hillside. The sandstone of which the hill is composed is reasonably stable and the excavation walls were found to stand on 1:1 slope. Part of the excavated material was stockpiled, and after construction in the cut is completed, will be used to backfill over the intake conduits and around the pumphouse structure.

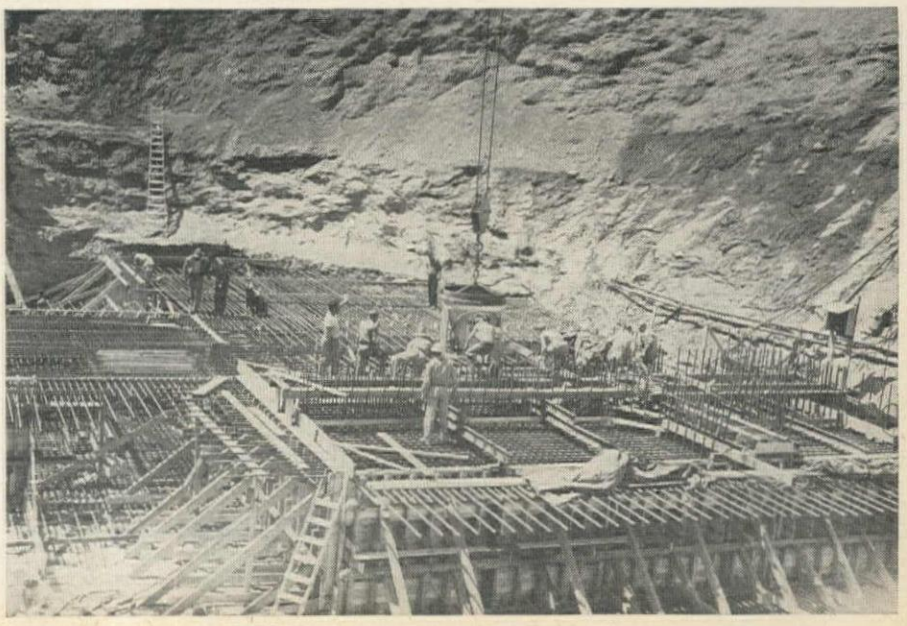
Intake works

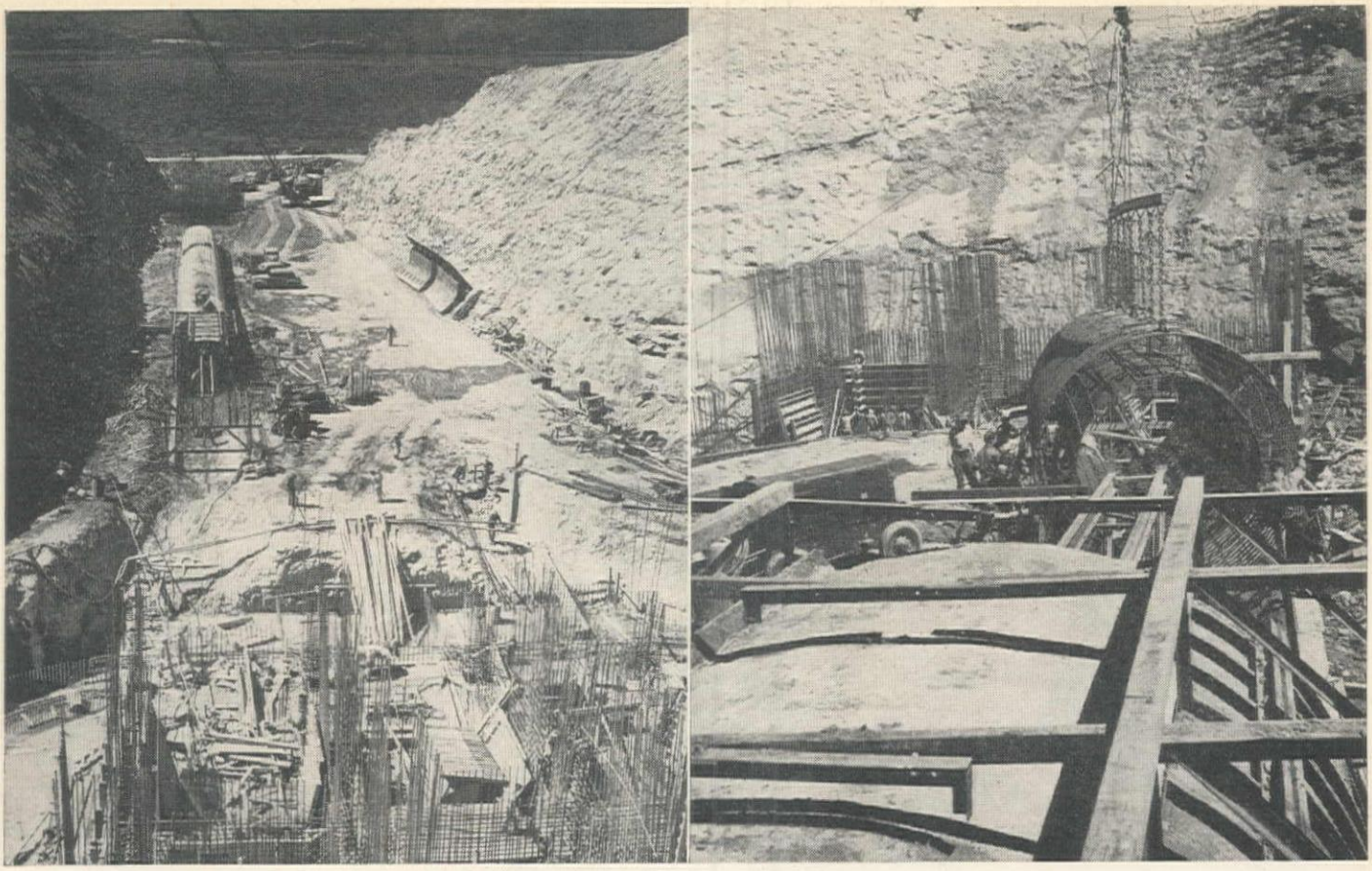
An intake structure is located 568.75 ft. from the centerline of the pumps, with a floor elevation 16 ft. below the minimum anticipated water level of Granby Reservoir, and 110 ft. below the maximum water surface. It is a radial structure of reinforced concrete, 40.5 ft. high with five streamlined columns separated by 30 deg. radially, allowing 6 ports, each 8 ft. 6 in. wide and extending virtually for the full height of the structure. Each column is grooved to accommodate steel trash rack panels.

The vertical back wall of the structure, from which the three conduits will emerge from three recessed openings, is also grooved, to permit the operation of vertical slide bulkhead gates over each pipe. Immediately behind each gate is a transition section, changing the cross-section of the conduit from rectangular to round.

The three intake conduits are each 7 ft. 3 in. in diameter, and lie on thoroughly compacted backfill, 14 ft. center-to-center for the first 233 ft. downstream from the backwall of the intake structure. Through this section, the walls of the pipes are 18 in. thick, reinforced with

FIRST POUR of concrete in the floor slab of the pumphouse, at the back of the excavation shown above. Concrete is mixed in plant above the excavation, trucked to excavated working area in buckets, then lifted to point of placement by mobile crane.





INTAKE PIPE under construction in Granby Pump Plant excavation. Several 25-ft. sections completed, and forms in place for another, left, pumphouse steel in foreground. Reinforcing cage being placed by crane preparatory to pouring another length of pipe, right.

1-in. round bars on 6-in. centers circumferentially, on both the interior and exterior walls, and 54 bars of ⅝-in. round steel longitudinally on 12-in. centers.

At 233 ft. from the intake structure, however, bends are introduced into the two exterior conduits so as to cause the pipes to lie 22 ft. center-to-center, for the remainder of the distance to the pumphouse. In this latter section, the walls of the pipes are increased in thickness to 27 in. The circumferential steel remains the same, but the longitudinal steel is increased to ¾ in. in diameter, and 60 bars are required. Covering outside the steel is 3 in. in both cases.

The heavy conduit pipe is being cast in place by the contractors, in 25-ft. lengths. Reinforcing cages are fabricated at the storage yard above the excavation and conveyed by truck to the pouring site. Collapsible steel forms are then placed to secure a smooth inside surface and heavy wooden panel forms are set for the exterior.

Concrete is batched and mixed at a plant adjacent to large aggregate stockpiles above the excavation, and trucked in 2-cu. yd. Gar-Bro buckets near to the point of placement, where the buckets are lifted from the truck bed by a crane and maneuvered to the desired position for discharge. An air-entraining agent, Vinsol-resin, is used in the concrete to increase durability and workability, for the very low water-cement ratio. The concrete is thoroughly vibrated with pneumatic vibrators as soon as placed. Samples indicate a 3,000-lb. strength in 7 days.

Discharge works

After passing through the centrifugal pumps, the water will pass into steel discharge pipes, which after passing through the walls of the pumphouse structure, pitch upward at an angle of 45 deg., raising the water from elev. 8180 at the pumps to 8255. At the latter elevation, the three pipes again level off and merge into one conduit, 11 ft. in inside diameter. A few feet beyond this transition section, a steel surge tank 25 ft. in diameter and 128 ft. high will be erected. The centerline of the tank is over the top of the conduit.

From the surge tank, the conduit is to be constructed of reinforced concrete pipe, also cast in place. Its diameter will remain constant at 11 ft. but its shell thickness will vary from 17 in. to 11 in., depending on the head in the pipe. The conduit covers a distance of 3,436 ft. from the surge tank to the discharge apron, and has a number of variations in grade. Elevation of the lip of the apron is 8358, although anticipated water surface in the pump canal which will convey the water from the discharge to Grand Lake, is 8368.39.

A short distance back from the discharge apron is a siphon, or hump, to prevent backflow from the canal. Elevation of the invert at the crest of the siphon is 8369, or slightly more than a half-foot above water level in the canal. A siphon breaker and air relief valve are to be housed in a small building built over the top of the siphon.

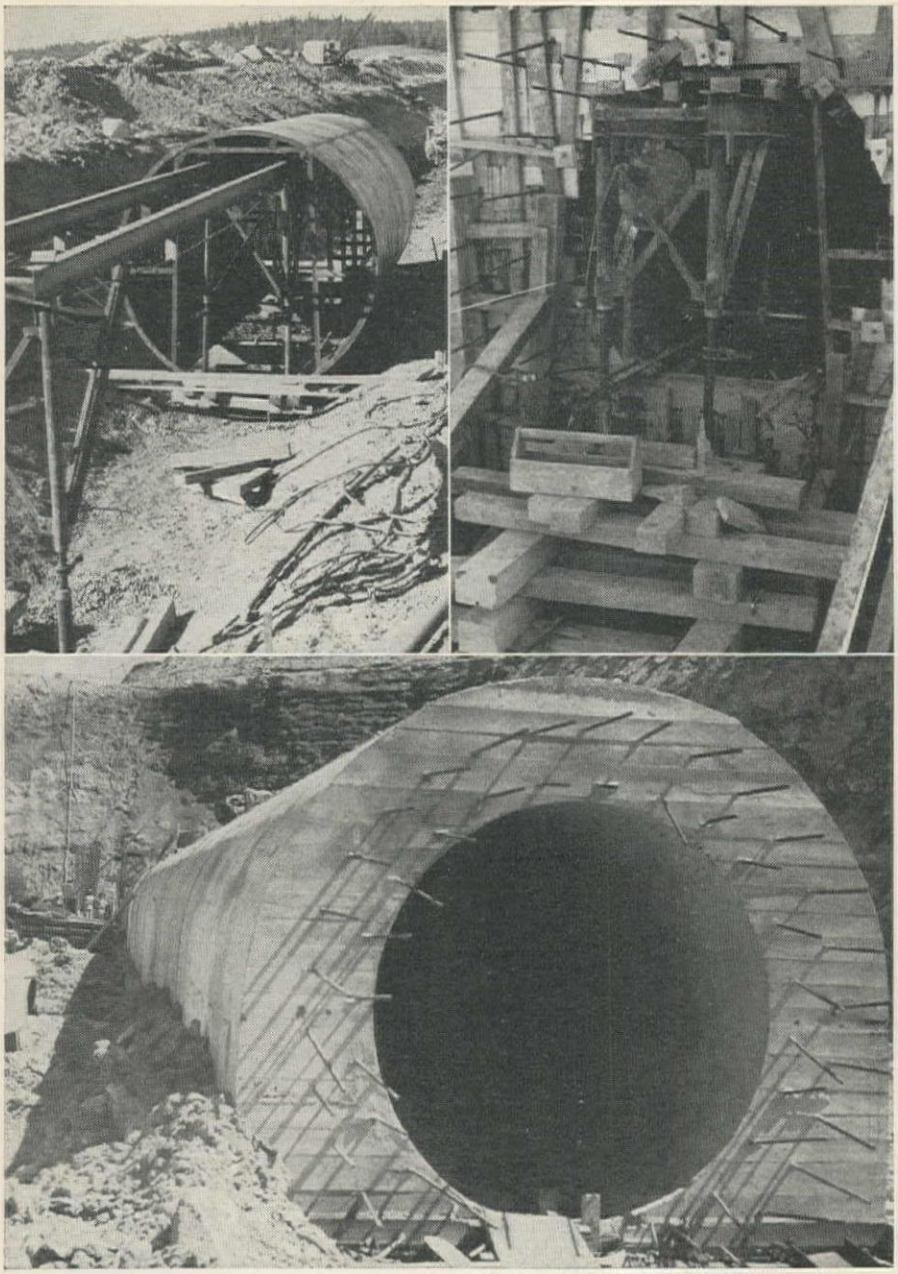
The walls of the discharge apron spread out from the mouth of the 11-ft. pipe to a width of 69 ft. The apron is designed as a trapezoidal transition, with a central section level floor tapering from 11 ft. wide at the pipe mouth to 20 ft. wide at the lip, with walls sloping upward at a slope of 2:1 to a maximum height of 12 ft. 3 in.

Pump canal

Under construction by Vinnell Co., Inc., simultaneously with the pumping plant by Granby Constructors, is a pump canal 9,352 ft. long from the discharge of the pump lift to Shadow Mountain Reservoir. It is designed to convey 1,100 cu. ft. per sec. of water, and is designed on a constant grade of .000146. In cross-section, the canal will have a horizontal bottom width of 20 ft., with sides sloping upward at 2:1 to a height of 14 ft. in cut and 15 ft. on embankment. At that elevation a horizontal berm 12 ft. wide will be constructed (16 ft. on embankment) and the land graded off beyond that.

By far the majority of the canal is being excavated in cuts, the maximum being approximately 70 ft. A variety of material is being encountered, varying from soil through very coarse gravel containing boulders weighing many tons, to hard granite bedrock. Considerable blasting has been found necessary in the case of the latter material, and to break up the largest boulders. Every type of excavating equipment is being used, including bulldozers, shovels, draglines, and scrapers.

At the end of the canal, where the water will be discharged into Shadow Mountain Reservoir, an elaborate structure has been designed. First a concrete



ADJUSTABLE inside form supports for concrete pipe being cast in place for Granby Pump Plant intake, top, showing interior form only at left, and complete formwork in place at right. Below is a finished section of pipe, showing 27-in. reinforced walls.

transition section will change the cross-section from the trapezoidal canal section to a double-barrelled rectangular box, each barrel measuring 12 ft. wide and 17 ft. 6 in. high. In these boxes will be radial gates with the concave surface toward the reservoir, to prevent return flow into the canal, and permit drainage of the canal should it be required for maintenance or inspection. Crest elevation of these gates will be 8375, while maximum water surface of Shadow Mountain Reservoir is established at 8367.

Beyond the gates, the rectangular boxes discharge into the reservoir over a fan-shaped apron similar in design, although somewhat larger, to that at the end of the pump conduit, previously described.

Silt removal

An interesting bit of incidental construction in connection with the project is the Soda Creek Diversion. Although the water entering Granby Reservoir either from the Colorado River itself or from the several tributary creeks is remarkably clear and free from sediment, there is always some turbidity during floods, and it is felt that at times when the water surface approaches its minimum level, some silt might be generated by washing within the floor of the reservoir itself.

Since the intake for the pumping plant is located in the bed of one of the small tributaries, Soda Creek, at an elevation only a few feet below minimum water surface, the flow along the creek bed toward the intake might conceivably carry considerable mud as water drained from the higher portions of the floor, so a small earth dam is under construction about 2,000 ft. upstream in Soda Creek from the intake. It will have a crest elevation of 8242, well under maximum water surface of 8280, and a diversion channel with a trapezoidal section and 15-ft. bottom width is being excavated through an intervening ridge to the bed of Stillwater Creek, another tributary, also within the basin of the reservoir.

In other words, both the earth dam and the diversion channel will be entirely under water when the reservoir is filled, but as the water level drops, the dam will commence to emerge and the flow in Soda Creek, both natural and the drainage from the reservoir floor will be diverted to Stillwater Creek, down which it will flow to the main body of water in the lowered reservoir. Any silt or transported material will precipitate at the point where Stillwater Creek reaches lake water, and will not be conveyed up the lower portion of Soda Creek to the intake.

Organization

The Colorado-BigThompson Project is a Bureau of Reclamation undertaking. Walker Young is chief engineer of the Bureau, with headquarters at Denver. The project is in the jurisdiction of Region VII of the Bureau, Avery A. Batson, director, also with offices in Denver. G. R. Highley is construction engineer in direct charge of the Granby Dam and Pumping Plant work; R. J. Willson is field engineer for the same jobs; and C. S. Scribner is resident engineer for the Bureau of the pumping plant and canal. G. G. Rollstin is office engineer.

Granby Constructors, the joint venture firm which is constructing both Granby Dam and the Pumping Plant, is composed of Grafe-Callahan Construction Co., Los Angeles; Gunther & Shirley, Los Angeles; Brown & Root, Inc., Houston, Tex.; Condon-Cunningham Co., Omaha, Nebr.; Ed Honnen, Colorado Springs, Colo.; Martin Wunderlich, Jefferson City, Mo.; and Peter Kiewit Sons' Co., Omaha, Nebr. The amount of the firm's contract for the pumping plant is $4,139,998. Ed Honnen is project manager for the firm on the Granby work, and Charles Clapp is superintendent in charge of work at the pumping plant.

Vinnell Co., Inc., Alhambra, Calif., has placed H. F. Lilley in charge as superintendent of their $591,458 contract for the pump canal.

Activated Sludge Plant Is Suggested for Boise Sewage

AN ACTIVATED SLUDGE sewage treatment plant has been recommended for construction by the city of Boise, Idaho, in a report on the sewage disposal system by Alvord, Burdick, and Howson, consulting engineers of Chicago. At present the city's sewage is being discharged directly into the Boise River without treatment.

A preliminary estimate sets the cost of the plant at about $1,024,000. The engineers also recommended the construction of an interceptor at a cost of $172,000 to serve the south Boise and bench area which is now largely unsewered.

Structural Engineers Meet at Park

California engineers discuss building codes, seismology and its relation to building design, construction volume, and public relations in convention held in beautiful Yosemite Valley

THE 1947 CONVENTION of the Structural Engineers Association of California was held Oct. 17-19 in Yosemite National Park. Under the constitution of the organization the state officials are the local Association officials of the Northern and Southern California sections alternately, and this year the Northern California section officers presided and arranged the program. One hundred ninety-three members and guests were registered and participated in the technical program and social events.

The general theme of the convention was, "The Structural Engineer and Public Relations." William W. Moore, president of the Northern California Association, presided over all meetings, but appointed moderators for particular sessions. William H. Popert was in charge of the Friday morning session; Prof. Clement T. Wiskocil, the Friday afternoon session; and Richard W. Ware, president of the Southern California Association, the Saturday morning session. George Washington of San Francisco was general chairman of the convention. Lloyd White was in charge of the recreational program and Ira Kessey of the Saturday night banquet.

Among the speakers in the very full program were, James W. Follin, assistant administrator of the Federal Works Agency, Washington, D. C.; Frank A. Kittredge, superintendent of Yosemite National Park; John G. Little, chief building inspector of the city of San Francisco; Clifford W. Dorwin, manager of California State Builders Exchange, Oakland; S. B. Barnes, Portland Cement Association, Los Angeles; Henry J. Brunnier, consulting engineer, San Francisco; R. McC. Beanfield, consulting engineer, Los Angeles; Frank P. Ulrich, seismologist, Coast & Geodetic Survey, San Francisco; Prof. George W. Housner, California Institute of Technology, Pasadena; John M. Server, Jr., editor of *Western Construction News*, San Francisco; Mark Falk, San Francisco; Paul E. Jeffers, Los Angeles; and A. V. Saph, Jr., San Francisco, members of the Board of Registration for Civil Engineers.

Engineering seismology

Of particular interest among the addresses at the convention were those by Frank P. Ulrich, Professor Lydik S. Jacobsen and Professor George W. Housner on the study of seismology and its relation to structural engineering. Ulrich outlined the development of the study and the recent organization of an Advisory Committee on Engineering Seismology of the Coast & Geodetic Survey. According to Professor Jacobsen, the function of this new committee is to discover the way to apply existing earthquake information to the practical questions of structural design. He advocates the formation of a technical institute where full-time personnel, selected with regard to practical experience, theoretical background and freedom from bias, will engage in practical application studies.

Professor Housner outlined some of the research being conducted on earthquake forces at the California Institute of Technology, with the hope of developing sound rules to govern the design of structures to resist earthquakes. Two promising methods of approach are being studied. The first is to make statistical studies of damage incurred during earthquakes, and the second is to make an analysis of the dynamic behavior of structures when subjected to strong motion earthquakes. Before the effects of earthquakes on structures can be predicted, it is necessary not only to learn the characteristics of earthquakes, but also to determine accurately the properties of the actual structures. "It appears," said Professor Housner, "that the characteristics of the ground upon which the foundation of the structure rests may have an important influence upon the dynamic behavior of the structure, and it also appears that the internal dissipation of energy within the structure during an earthquake has an important effect upon the stresses developed."

Construction volume

Mr. Follin spoke on the question, "Can the Construction Industry Fulfill the Nation's Requirements?" His answer was that he couldn't answer the question right now. He referred to the estimated 12 billion dollars in new construction in the United States this year, which is second only to the peak wartime construction for 1942, but commented that "actually, things are not always what they seem to be." He stated that it is difficult to estimate the actual physical volume for 1947 because of the wholesale price increases for building materials and wages. Follin estimated that a round figure of $6,500,000,000 in terms of 1939 prices would be constructed this year, in which case the physical volume is probably less than in the late 20's, not much over 1931, and about the same as in 1939-40. "A greater volume of activity for the construction industry depends in large part on a lowering of costs, both in current dollars and in relation to the income, to obtain a broadening of the market," Mr. Follin said. He felt that the most likely way to decrease construction costs is through greater productivity.

Kittridge and Server spoke at the annual banquet Saturday night in the Ahwahnee Hotel. The former gave a very pleasant resume of the history of Yosemite National Park and some of the humorous, as well as serious incidents in the life of the administrator of the great playground. Server spoke on "Structural Engineers as Viewed by an Editor," stressing the means by which the Association and any other engineering body could receive favorable publicity. "Two requirements face you," he said, "if you wish to conduct an effective public relations program: (1) you must say or do something which is newsworthy; (2) you must not hide your light under a bushel, but must be willing to aggressively, even ruthlessly project your story over and over again to the editors of selected publications which can do you the most good."

WILLIAM W. MOORE, President of the San Francisco Association, acted as chairman of the state-wide Structural Engineers convention.

Engineer Jobs Available

THE CORPS of Engineers in the Sacramento District of California has indicated that it is ready to talk business with qualified design engineers and draftsmen, and with men interested in field party survey work.

The Corps is faced with the appropriation of funds to proceed on the design and construction of seven out of their sixteen authorized concrete and earth fill multi-purpose dams in the Sacramento and San Joaquin Valleys. This is in addition to stepped-up schedules generally.

Regardless of the present urgency, it is pointed out, however, that all candidates will be required to qualify themselves through the usual civil service channels at the first opportunity if a regular appointment is desired. Those interested are urged to report in person or in writing to the District Engineer, Corps of Engineers, at the Wright Building, 8th and L Streets, in Sacramento.

New Los Angeles Sewer Outfall

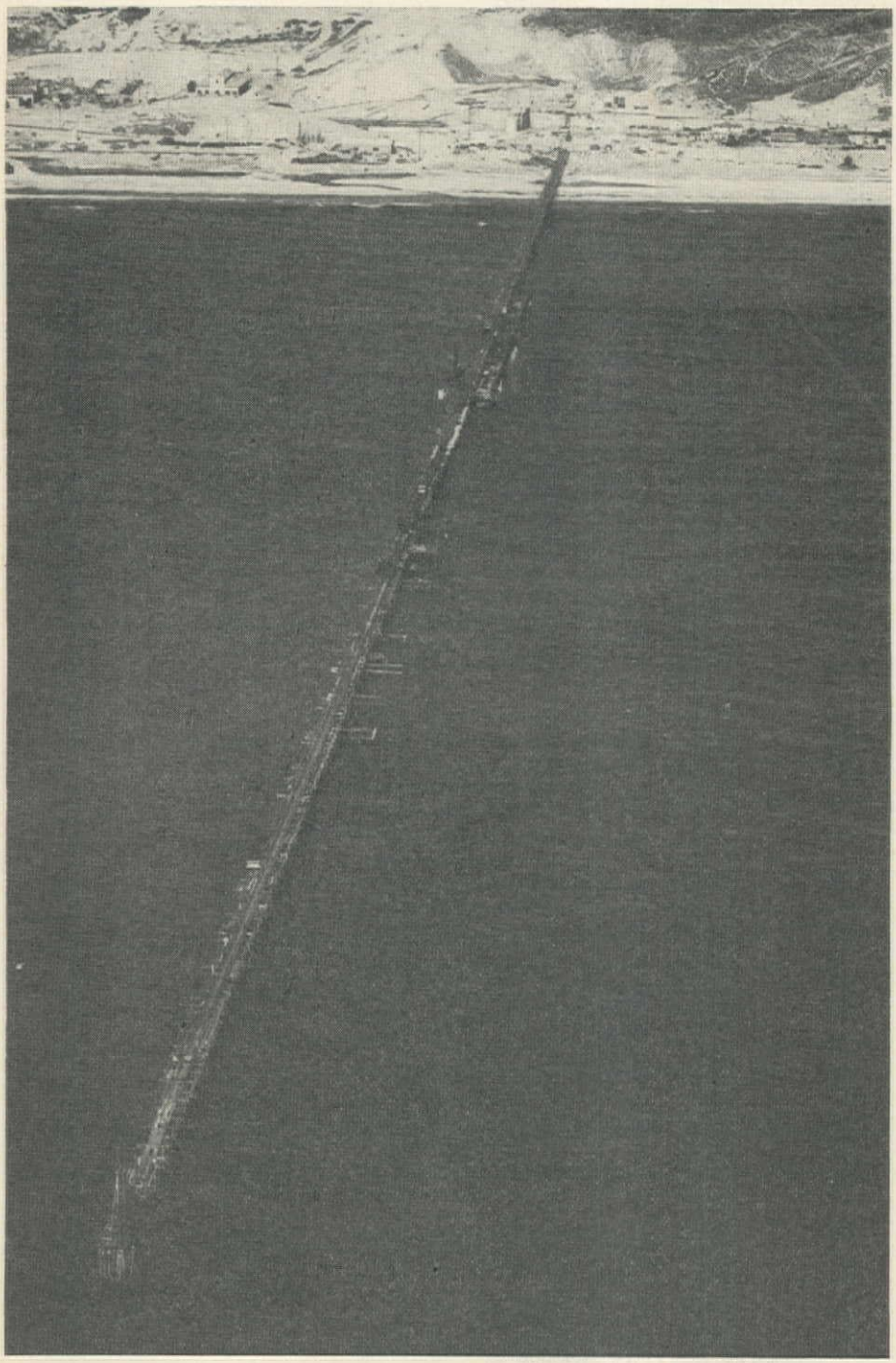
Part of a 3-yr. Master Plan for the area, the 12-ft. ID submarine outfall presents construction difficulties—Covered and uncovered sections require working both ways from transition point—Tugs and floats used to transport pipe 25 mi. from casting yard to job site—Outfall will be immediately cut in when work is completed

By VANE STROTHER
Los Angeles, Calif.

ONE OF THE MOST difficult jobs of its kind is being handled by Guy F. Atkinson Company for the city of Los Angeles in the laying of a mile-long 12-ft. inside diameter submarine outfall sewer line at Hyperion, between Manhattan Beach and Playa Del Rey. The ocean outfall, first unit of the 32,000,000 Hyperion Activated Sludge Plan, will serve the modern sewage plant now being built in an effort to solve the Southern California city's steadily growing sewage disposal problems.

A three-year project, the Plan will open for public use approximately nine miles of beach, between Santa Monica and Hermosa Beach, now under quarantine by the State Department of Public Health.

When the new outfall is completed it will be cut in immediately. The old 7-ft. I. D. outfall, which lies about 1,000 ft. north of the new line, was built in 1924 without footings or collars and is leaking badly. This leakage, largely untreated sewage, has made Los Angeles the target of an unceasing storm of criticism ever since the first quarantine was imposed in 1943.



AERIAL PHOTO shows work trestle paralleling sewer along north side. Wide section nearest the shore is cofferdam for covered section. Pipe setting operations are shown farther out on the trestle. The last set of falsework is for constructing footings. The trestle, built on six-pile bents, is designed to carry 30-ton locomotive cranes.

Project plan

Completion of the $3,517,410 outfall, which was begun in June, 1946, is scheduled for next February, but Atkinson is pushing three crews in an attempt to finish around the first of the year.

Starting at the beach just above high tide line, the new outfall runs along the ocean floor and terminates 50 ft. under water (mean low tide). Actual construction work was begun in the middle of the line with crews working toward both ends. Reason for this is the fact that two types of construction are called for in the sewer's specifications, a covered section, and an uncovered section of 12-ft. I. D. concrete pipe. Transition point for the covered and uncovered sections is at station 20 + 80, approximately 1,900 ft. from the beach in a 25-ft. depth of water, which is beyond the surf line.

The covered or inshore section, 2,224 ft. in length, is being built within a cofferdam, by setting 12-ft. I. D. pipes, 12 ft. in length, on a 6-ft. thick tremie concrete platform which is supported by 14-in., 102-lb. H-piling driven in 5-pile bents spaced to suit loading conditions. The pipe is completely encased with tremie concrete to a minimum thickness of 18 in. over the top. The platform and encasement are reinforced by 1¼-in. reinforcing bars spaced 2 ft. on centers in both directions.

Cofferdam

The cofferdam, 20 ft. in width from center to center of walls, is fabricated from steel sheet piling 45 and 50 ft. long, with a 14 x 16-in. timber waler placed

at elevation plus 14 ft., and 12-in., 53-lb. H-struts spaced approximately 15 ft. on centers.

This cofferdam, driven in 100-ft. lengths, prevents drifting sand from entering the working area, and serves as a form for concrete poured in the platform and encasement and also provides protection from the ocean action, lessening the effect of surge and the pounding of the surf.

The uncovered section, extending seaward from the transition point, is composed of thirty-two 12-ft. I. D. pipes each 100 ft. long, supported at the joints by footings 13 ft. wide, 30 ft. long and 7 ft. thick, resting on twelve 14-in., 102-lb. H-piles 40 ft. long.

The short sections of pipe, which have a 12-in. wall thickness and weigh 40 tons, are manufactured by the American Pipe and Construction Co. in Southgate and are hauled 22 mi. to Hyperion on low-bed trailers. The 100-ft. sections weigh 500 tons each and are cast by the contractor at a special yard in Long Beach harbor and towed approximately 25 mi. to the job site.

Working trestle

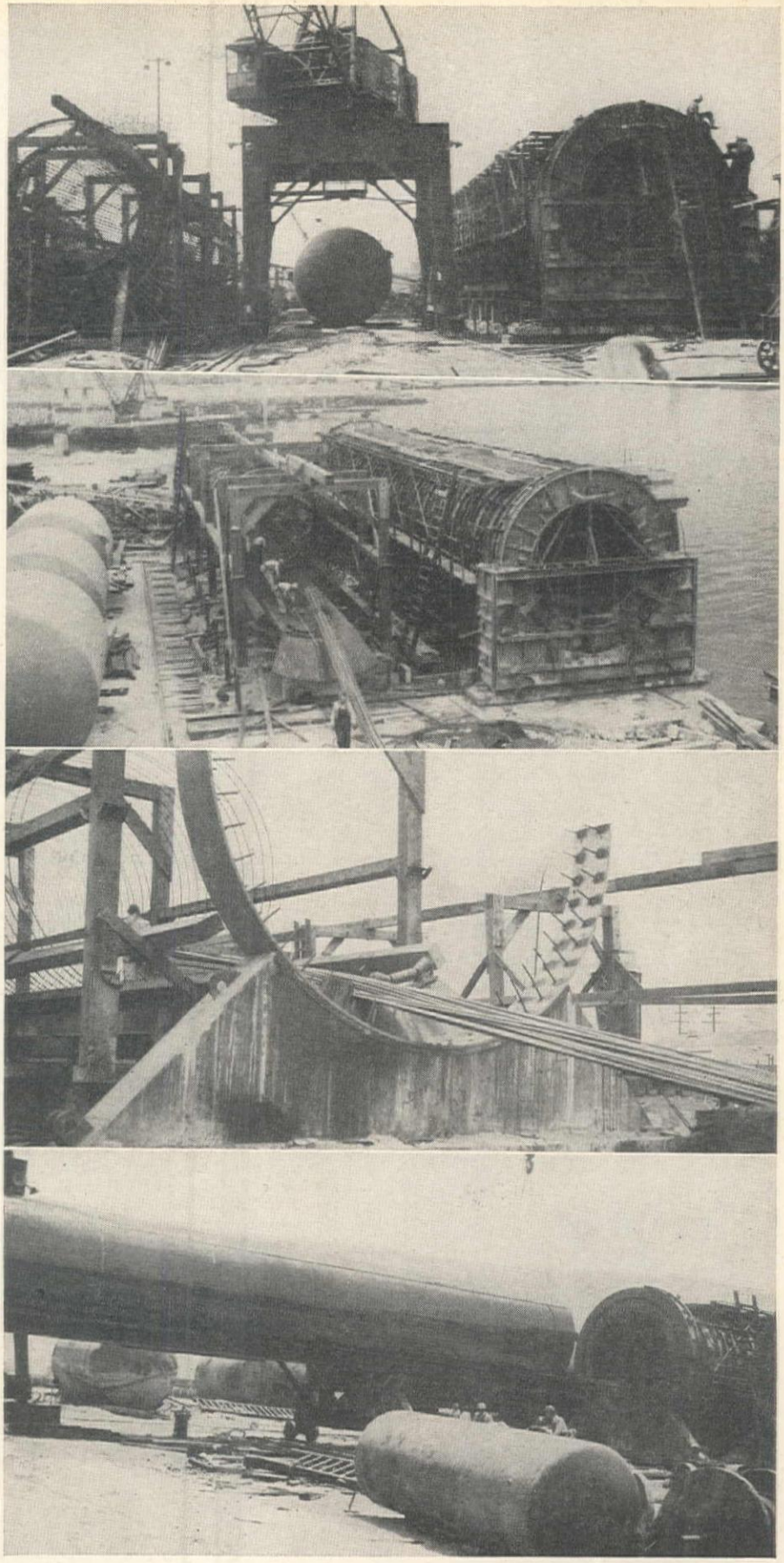
Contract specifications required construction of a work trestle parallel to and on the north side of the covered section. The contractor, to facilitate construction, decided to build the work trestle alongside the total length of the sewer. This trestle, with six pile bents, designed to carry 30-ton locomotive cranes and other railroad equipment, has a top of rail elevation of +14 ft. The waler at the top of the cofferdam is attached to the trestle piling. Center line of the trestle is 21 ft. north of the outfall sewer line. Trestle pilings were driven by a skid driver with a Vulcan No. 1 pile hammer, and jetting was used to obtain the desired penetration in the sand and/or gravel ocean bed.

The following equipment is being used on this project: three locomotive cranes, one skid pile driver, one railroad type pile driver with telescopic leads, one 40-ton gantry crane built especially to set the 12-ft. pipes and pour tremie concrete in the covered section, three 20-ton diesel locomotives, a 150-ton batching plant with two 1-cu. yd. mixers, one truck crane for yard service, and flat cars.

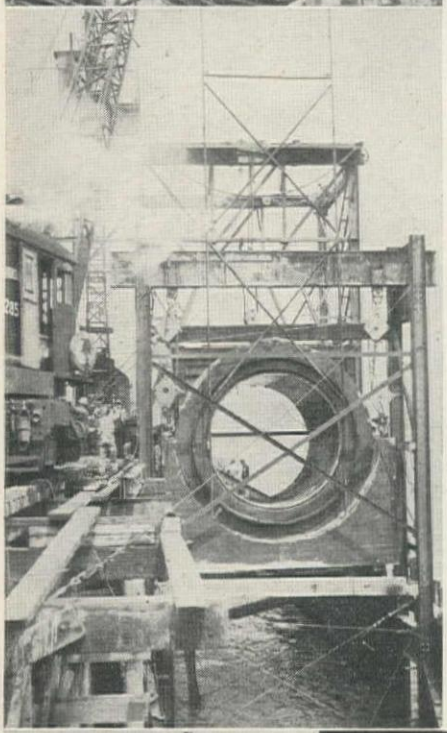
The transition pipe at the junction of the covered and uncovered sections is a 16-ft. replica of the bell end of the 100-ft. pipe. The inshore end, however, was cast with the conventional type of bell with a bevel 8 in. deep to receive the 12-ft. pipe.

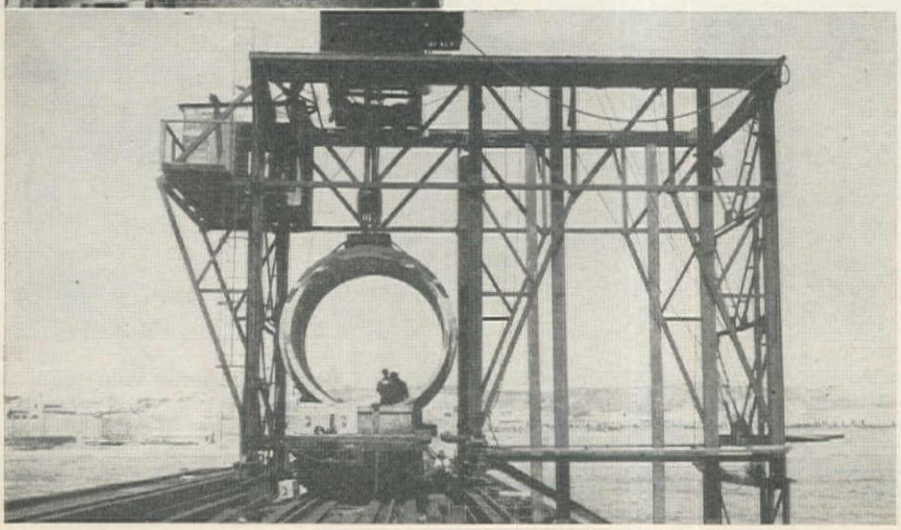
Since the transition pipe would weigh 130 tons, it was built at the job site and poured on falsework above its footing, then lowered onto the footing by a gallows frame, the gantry using three points to attach the falls. A 3 x 12-in. x 15-ft. mean diameter rubber sealing ring placed in the 100-ft. pipe joints was fitted into the offshore end of this pipe to make up the joint of the first 100-ft. pipe.

The building schedule for the covered section is: Drive and frame the coffer-



GENERAL VIEW of the Atkinson Co. casting yard, top, shows gantry crane of the shipyard type used for handling form sections, and second, the assembly of steel reinforcing cage and outside form for the 100-ft. pipe. Third view is of wrought iron ring for spigot end of the 100-ft. pipe resting on launching cradle, and bottom, inside form after removal from newly cast length for reuse. Ways are arranged to provide space for moving this form from one pipe for resetting in the next scheduled pipe. The form moves within the pipe on dollies onto a transfer frame on tracks.





BULKHEAD in place on bell end of pipe, top, and center, the transition section being lowered onto footing. Below, gantry lifts a 40-ton 12-ft. inshore length prior to setting in cofferdam for covered section.

dam, using locomotive cranes to excavate and subgrade; drive the foundation piling with the railroad pile driver; fabricate the platform reinforcing steel mats in 60-ft. sections and place; pour the tremie concrete in the platform, employing the gantry crane with two 12-in. tremie pipes having 5-cu. yd. bowls; set the 12-ft. pipe on the platform in precast concrete cradles; fabricate the top reinforcing steel cages in 60-ft. lengths and place over pipe; and finish the structure by pouring the tremie concrete encasement with the gantry crane. Pulling the sheet piling in the cofferdam for redriving inshore completes the construction cycle.

The platform concrete pours are made in lengths of approximately 115 ft., with a bulkhead at the end of each pour. Ten lengths, or 120 ft. of pipe, are set and then the encasement pour is made with the natural slope of the concrete forming the construction joints.

Pipe casting yard

Since the job site was not suitable for launching the 100-ft. pipes, due to a gradually sloping beach and heavy surf conditions, a site in the Long Beach harbor area was selected as the casting yard. This site has a minimum depth of 20 ft. of water for launching and is adjacent to a ship channel in the harbor.

The 100-ft. pipes are cast on two sets of ways which each have space for four pipes. The ways are arranged to provide space for moving the inside form, as a 100-ft. unit, from the interior of one pipe for resetting in the next pipe scheduled for pouring. The form moves within the pipe on dollies and onto a transfer frame on tracks between the casting ways for shifting between pipe casting locations. Steel forms are used to assure a smooth interior finish and to obtain the specified pipe dimensions.

Exterior forms are set and stripped in sections weighing about 25 tons. An electrically powered gantry crane of the shipyard type is used for handling all form sections, except the inside section.

Concrete for the 100-ft. pipe is mixed by a paving mixer using batched aggregate delivered by trucks from a commercial plant. The cement, Type II, is added to the batch at the site. Hoop reinforcing steel is pressure welded and arc welding is used in assembly of the reinforcing cages.

Launching and towing

In preparation for launching, wire rope pennants, flotation tanks, and end bulkheads are placed on the pipe. The side launching method is used with the pipe supported by cradles at each end. Heavy tackle controls the pipe's movement during all phases of the operation.

After being prepared for launching the pipe is moved along the casting ways onto 50-ft. ramps which are lowered into the water. A sea-going tug tows the pipe to Hyperion, a distance of 25 mi., during the night and arrives at the job site about 6 o'clock the following morning.

At the sewer site, six wire rope handling lines, a head, stern and quarter lines are attached to the pennants to control the pipe when released by the tug and while it is moved alongside the trestle to approximately the sewer center line. When the pipe reaches a position where the spigot end is about 5 ft. from the pipe previously set, it is flooded and sunk to the ocean bed. Flotation tanks are released when the tug is about 50 ft. from the trestle and are towed back to Long Beach.

A small tug assists in attaching the handling lines and in holding the pipe while it is placed alongside the trestle. Bulkheads are removed by divers after the pipe has been flooded.

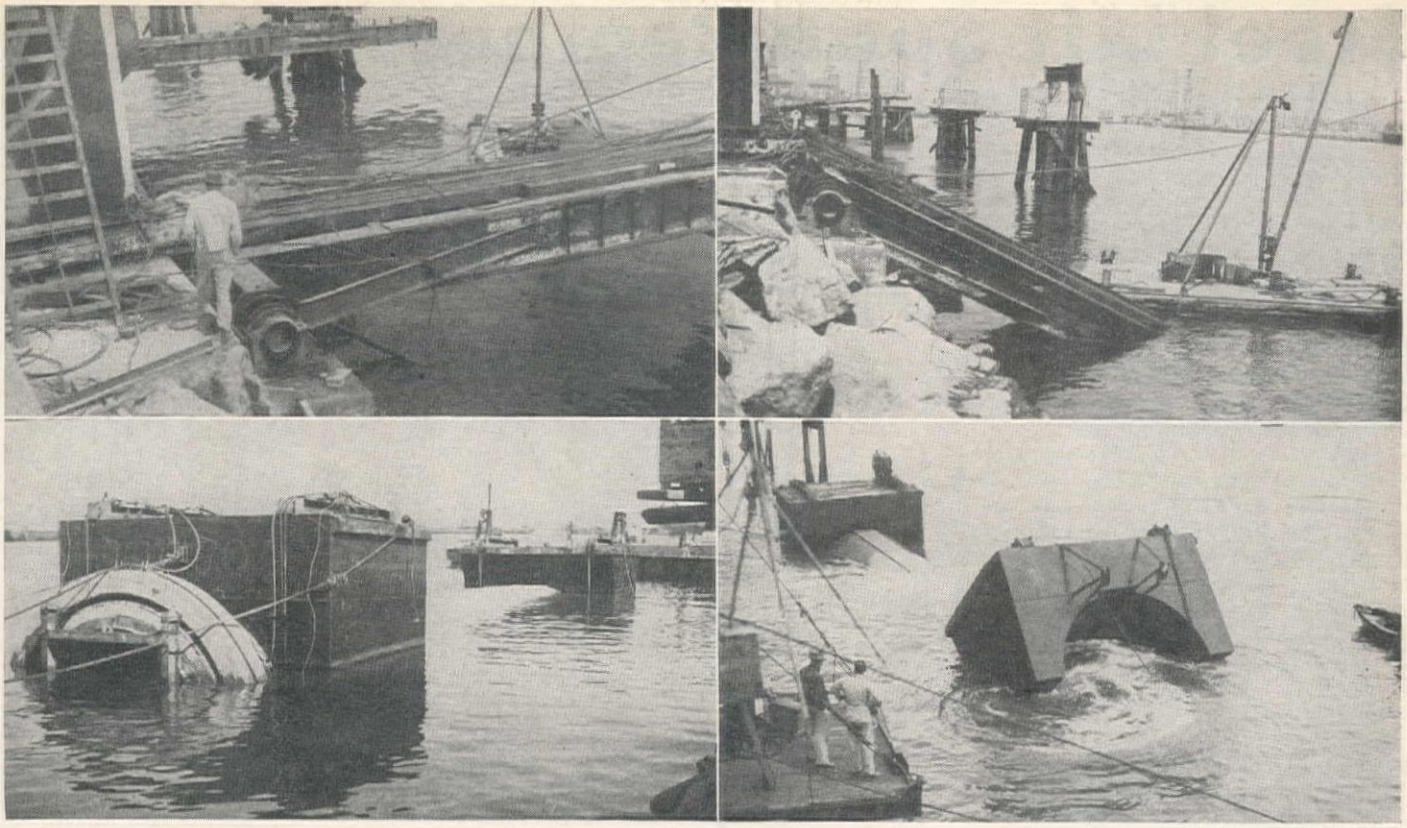
To complete setting the pipe, movable towers are set astride the footing at each end. Two 12-part falls attached to crosshead beams on the trestle caps lift each end of the pipe. Locomotive cranes furnish power required to lift the pipe, using rigging capable of lifting a 300-ton load.

By simultaneously lifting the pipe with heavy tackle and moving it with handling lines, the spigot end is placed in the 26-in. wrought iron ring of the bell on the pipe previously set, and the bell end is set on its footing. Additional lifting and hauling inshore with the head line seats the spigot end recess over the rubber sealing ring placed in the bell end of each pipe. The sealing ring is compressed until the distance between the two pipes is about one inch, thereby forming a water tight joint.

Placing tie-downs from pipe to footing, concreting the keyway around the pipe base, and pouring a concrete collar over the joint finishes the pipe setting. At the time this article was written the contracor, working a six day week, 24 hour day schedule, had set 14 lengths of 100-ft. pipe and had completed about 650 ft. of the covered section.

L. A. sewer system

Starting point for the sewer line that discharges from the outfall at Hyperion is in Canoga Park, Los Angeles' northwestern-most suburb. The line, starting



LAUNCHING RAMP for 100-ft. pipe is in raised position with pipe ready to be moved onto ramp, upper left, and in lowered position, right. Lower left, the pipe launched with flotation tanks in place ready for the tow, and right, tanks, being removed at the job site. Pipes were launched at the casting yard in the Long Beach harbor area since gradually sloping beach and heavy surf conditions made the job site unsuitable.

with a diameter of 15 in. and growing to 12 ft., covers 55 mi. and serves 10 outlying towns besides 90 per cent of the population of Los Angeles. About 4,000 mi. of laterals and interceptors empty into the main line before it reaches Hyperion.

In addition to the estimated $32,000,000 to be expended on the new outfall and treatment plant, about $10,000,000 will be spent on the city's general sewer system.

The new treatment plant was started in March, 1946, adjacent to the old Hyperion plant. Plans call for a high rate activated sludge type system to handle the 245,000,000-gal. daily sewage rate expected about 1956. (The present load is 190,000,000 gal. daily.) The new plant will cover 80 ac., compared with the older system's ¼ acre, and will remove 85 per cent of the solids compared to the old plant's 5 per cent. In building the new plant, each unit is being let as a separate contract.

Sewage treated at the plant now under construction will be discharged as a harmless, germless fluid to be dissipated by the ocean currents.

Design of the plant and outfall is under the direction of H. G. Smith, engineer of sewer design for the city of Los Angeles, whose principal assistants are F. M. Darnell for administration and G. A. Parks, W. A. Wright, and N. M. Cireno for general plant, structural, and architectural design respectively. Lloyd Aldrich is City Engineer.

Top personnel on the outfall job for Atkinson are D. E. Root, manager and vice-president of the company; John J. Morton, project manager; Philip N. Fletcher, project engineer; L. A. Cook, office manager; and R. L. Freeman, general superintendent.

USBR Report Adverse to Texas Irrigation Plan

A REPORT recommending that no authorization be sought at this time for the Bureau of Reclamation to develop the irrigation and related water resources of the Nueces River Basin and adjoining Baffins Bay coastal area south of Corpus Christi, Tex., has been officially transmitted to the Congress.

Findings by the Bureau of Reclamation indicate that irrigation farmers would be able to repay only a very small portion of the project costs chargeable to irrigation under today's inflated prices. Also, no practical means could be found for providing irrigation water for the Baffins Bay area.

The unfavorable recommendation does not prejudice future re-examination of the entire basin plan or any of its features or units at such time as further information or changed economic conditions may warrant.

The Bureau of Reclamation ascertained that development of the Nueces Basin project outlined in the report would cost about $81,500,000 at 1946 prices. This was 64 per cent more than the $49,559,000 the project would have cost at 1940 prices.

The potential plan for developing Nueces Basin resources outlined in the report provided for six multiple-purpose reservoirs which would store enough water to irrigate 63,470 ac. of new lands and replace ground water now being pumped to irrigate 7,530 ac. more. The generation of hydroelectric power was found not to be feasible at any of the dams because of the low water supply and the lack of sufficient head.

Comments from the Secretary of War, the Governor of Texas, the Department of Agriculture, and the Federal Power Commission supported the adverse recommendation of the Secretary of the Interior.

Utah Explorers Locate Site For Bridging Colorado River

A UTAH exploration party scouting for a suitable site at which to bridge the Colorado River near Hite has discovered an admissable location for a structure. Utah is seeking to bridge the Colorado to provide a continuous route through the Wayne Wonderland in northern Wayne County to the Mesa Verde and connecting with the portion of highway which exists from Hite to Blanding east of the Colorado.

The party traveled by automobile to a camp beyond Hanksville and continued by pack train to the Cedar Mesa Cliffs. The rest of the journey was on foot. Even though the Colorado is only 200 ft. wide at the site located, the bridge would involve an expensive dugway from the rim of the Dirty Devil River to the bottom of the wash.

Arthur F. Crawford, Utah commissioner of the Department of Publicity headed the explorers.

Steel Lift Span Replaces Bascule

Terminal Island Access Freeway, now nearing completion, entails construction of 700-ft. steel lift bridge and approaches —Unusual foundation problems solved by draining underground water storage

By ERNEST DENNING
Long Beach, California

THE TERMINAL Island Access Freeway linking Southern California cities with important island naval installations, industries and commerce facilities probably will be ready for use Jan. 1, 1948. While the broad and extensive freeway approach system was about completed Oct. 1, considerable work remained on the Commodore Schuyler Heim lift bridge before its completion.

The initiating agency for the project was the Navy Department. Officer in charge of construction for the Eleventh (Los Angeles) Naval District was Capt. Henry E. Wilson in the beginning. He was transferred early in September and was replaced by Capt. Clyde Coryell. Comdr. J. W. Frorath has been project manager since its inception.

The Navy Department originally supplied $10 million for the project pool; this sum has been revised downward to $8½ million—partly due to engineering economies.

The freeway north of Cerritos Channel is being constructed by the Public Roads Administration with PRA and Navy funds. Contracts were let in the name of the State of California which acted as agent for the PRA. This construction includes the grade separation where the Pacific Coast Highway (US 101) goes above the Freeway. The PRA originally supplied $4 million of the federal funds for the Freeway project; no revision has been reported.

The State of California was agent only for the PRA. No funds have been contributed for the Freeway by the State or by either the City of Los Angeles or the City of Long Beach.

Bridge contract

The contract for the Cerritos Channel bridge and approach structures was let by the Bureau of Yards and Docks of the Navy Department to United Concrete Pipe Corp., Baldwin Park, Calif., and Ralph A. Bell, Monrovia, as a joint venture, and Bell is project manager for the contractor. Other supervisory personnel are G. L. Curtis, project engineer, C. J. Hanson and A. Dalin, superintendents.

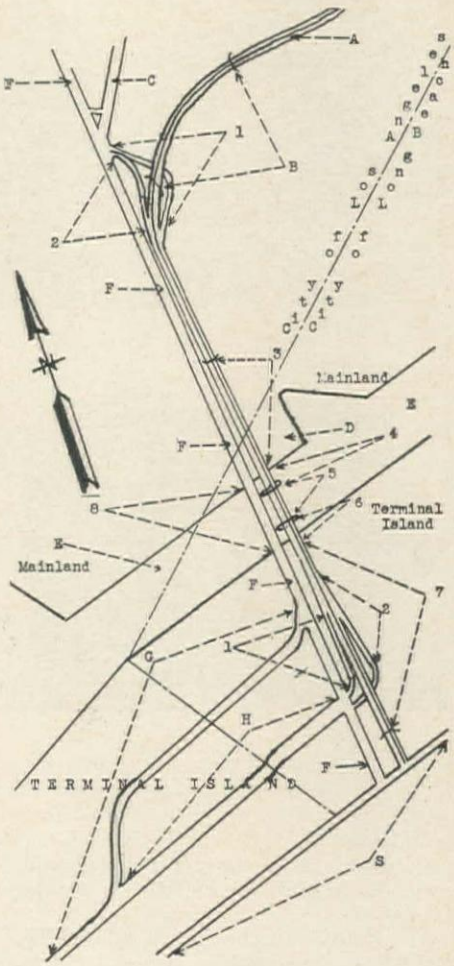
Sub-contracts for bridge and approach structures were let by the contractor as follows:

Steel superstructure including operating machinery for lift span—Columbia Steel Co., Los Angeles;

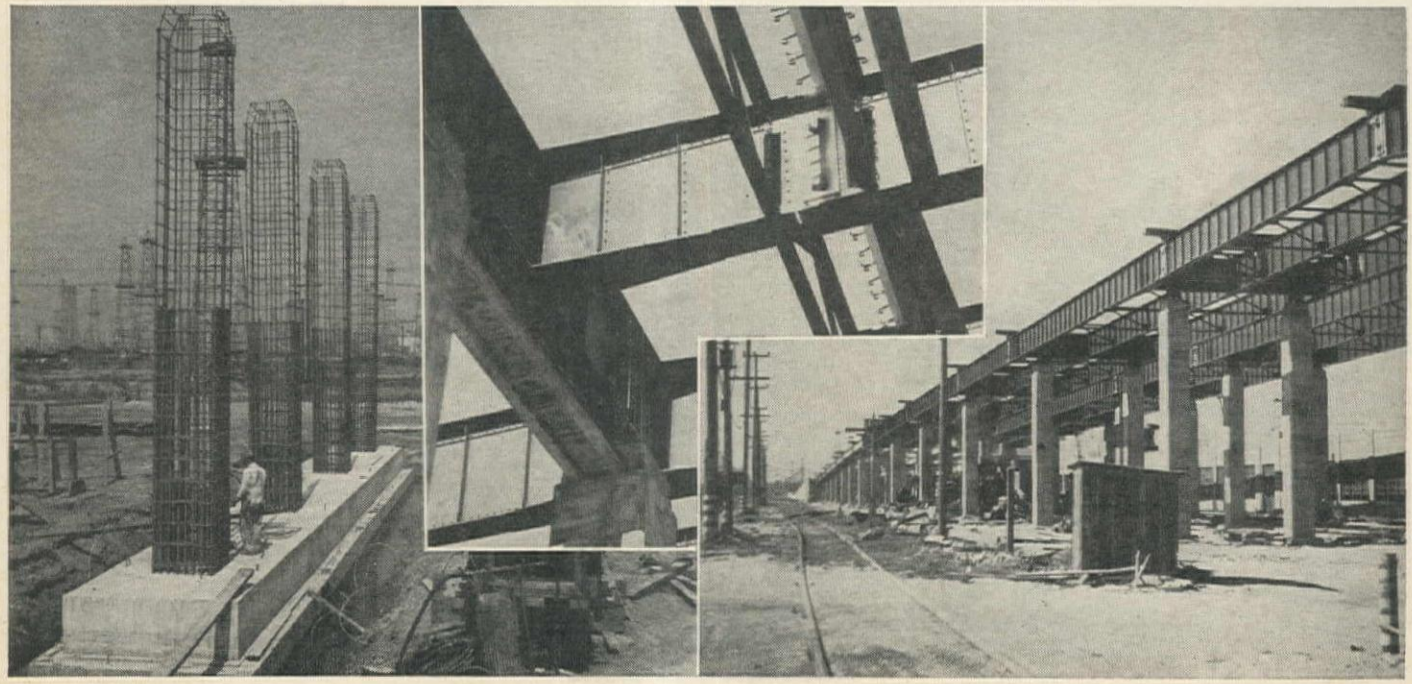
Erection — American Bridge Co., a subsidiary of U. S. Steel Co.;

Reinforcing steel—furnished by Bethlehem Steel Co. and placed by Anthony C. Meehleis, Los Angeles;

Cofferdams and pile driving—Proctor and Kuhn, Richmond, Calif.;



COLUMN STEEL in place for piers, bottom left, and right, the north approach viaduct nearing completion. Closeup shows girder detail, with hangers carrying suspended span at right. Fixed girders at left are cantilevered 16. ft. Sketch shows (A) southern portion of the Freeway, (B) grade separation, (C) Pennington Ave., (D) Ford Motor Co., (E) Cerritos Channel, (F) Henry Ford Ave., (G) Dock St., (H) Dock St. Extension, (S) Seaside Blvd., (1) outlet ramp, (2) inlet ramp, (3) and (7) north and south approach viaducts, (4) and (6) north and south approach spans, (5) lift span, (8) drawbridge.



Railings and miscellaneous iron work —G. A. Waterbury Co., Los Angeles;

Transit mixed concrete—Consolidated Rock Products Co., Los Angeles.

F. D. Chadwick, Lynwood, Calif., as a separate prime contractor, was assigned by the Navy Department to grade and pave the approaches to the bridge.

It is believed that the Terminal Island Access Freeway will be one of the first major post-war construction projects in the West to be entirely completed. The reason is that early and rapid transfer of government surpluses — principally steel, timber and timber piling, and lumber—was accomplished by the Navy for structure beginnings.

Bids were called for in September, 1945. The contract was let in December, 1945. Bridge construction started in January, 1946, and first traffic probably will cross the bridge in January, 1948.

Freeway location

The northern limit of the Freeway is at Willow Street, Long Beach—approximately 4,400 ft. west of the Los Angeles River flood control channel. From that point the Freeway runs south to Anaheim Street and then west toward and south paralleling Henry Ford Avenue. It is partly inside the City of Los Angeles and partly in Long Beach.

The southern portion of the Freeway, including the bridge, is all inside Long Beach. The southern extremity is at Seaside Blvd., a few yards east of Henry Ford Avenue which is the north boundary of the Naval Base on Terminal Island.

The Commodore Schuyler Heim bridge is over Cerritos Channel which separates Terminal Island from the mainland on the north. Cerritos Channel lies east and west, paralleling the ocean. Channel width is 180 ft.; it is 40 ft. deep with an average tide variation of 6 ft.

Heim bridge described

The Heim bridge with its approach viaducts has a total length from face to face of paving notches of 3,975 ft., 10 in. The bridge is the largest of its kind on the west coast. It is 700 ft. long between river piers. The north and south approach spans are each 206 ft., 9 in. long.

The lift span is the largest on the west coast with tower-tops higher than 200 ft. The lift span is 240 ft. long and weighs 860 tons. Sheaves for the lift span measure 14 ft. in diameter.

The north approach viaduct is 1,226 ft. long; it is composed of 16 piers from 70 to 93 ft. apart. The south approach viaduct is 1,974 ft. long, being composed of 26 piers from 60 to 93 ft. apart. In the approach viaducts, fixed and suspended spans are installed alternately and pin connected; these provide flexibility for differential settlement.

The three main bridge steel spans are of Warren-type through-truss design, with split panel points. Approach spans are of steel plate girders on reinforced concrete columns. Viaduct spans are supported on four-post bents, resting on continuous footings and 65-ft. wood piling.

Deck slabs are 40 ft. above ground level near the river piers. Clearance under the bridge at low water is 50 ft. When the lift span is fully raised, clearance is 175 ft. above low water.

Roadway pavement is 81 ft. wide with 3-ft. walks on either side and a 5-ft. center island running the length of the project.

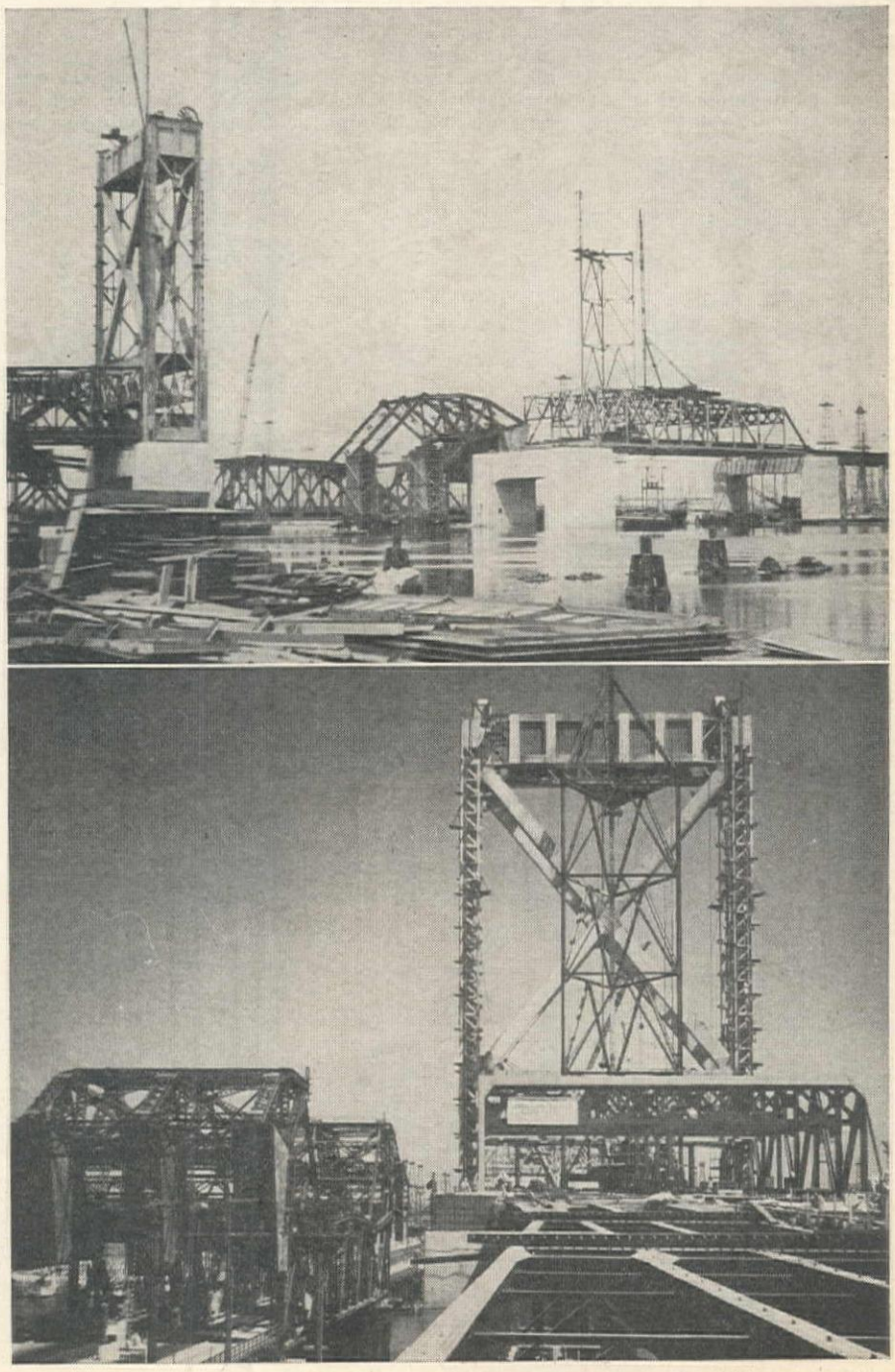
The bridge was designed by the Bridge Department of the California Division of Highways. F. W. Panhorst is bridge engineer.

Principal material items on the bridge and approach viaducts were as follows:

18,000 cu. yd. of land excavation
2,580 cu. yd. of water excavation
3,268 wood piles
1,552 steel piles
43,500 cu. yd. of concrete
2,460 tons of reinforcing steel
10,000 tons of structural steel
10,000 lin. ft. of galvanized hand railing

Unusual foundation conditions

Unusual foundation conditions on Terminal Island complicated the construction of the project. Allowance had to be made for settlement and lateral movement of the island. This very unusual condition, which has been noted for several years past, is due to geological deformations. The probable cause is the release of gas and oil pressure from under the island, due to the great number of wells tapping petroleum deposits un-



APPROACH spans nearly completed, top, with south lift tower well under way and derrick being raised to erect north tower. End-on view of south approach span and tower, bottom, with existing bascule bridge at left. Projections on tower are supports for plates which will enclose tower legs.

der the island and the mainland adjacent.

There has been a continuous settlement of the area since 1941, and this is now in excess of 2 ft., 6 in. The earth at the bridge location is moving laterally, also, with a tendency to close up the banks of Cerritos Channel.

To compensate for these shifts and movements, the lift span was constructed to allow for a 12-in. adjustment with a 9-in. adjustment in each of the two approach spans. These compensations will permit a total shortening between outside river piers of 2 ft., 6 in. should it become necessary.

On the surface portions of the Freeway, it was necessary to stabilize the embankments so far as possible, by draining water stored in the underlying pervious strata. To accomplish this end, vertical sand drain construction, perfected by the California State Division of Highways, was adopted, some of the holes being as much as 50 ft. in depth.

On this project, a casing with a special jetting head was sunk, forcing material up around the outside of the casing. After sufficient depth was attained, the holes were backfilled with clean, coarse, graded sand, and a 2-ft. layer of similar sand laid on the ground for the full width of the embankment. As the embankment was subsequently placed, and pressure on the underlying strata increased, ground water was forced up through the drains, to be carried away through the sand blanket.

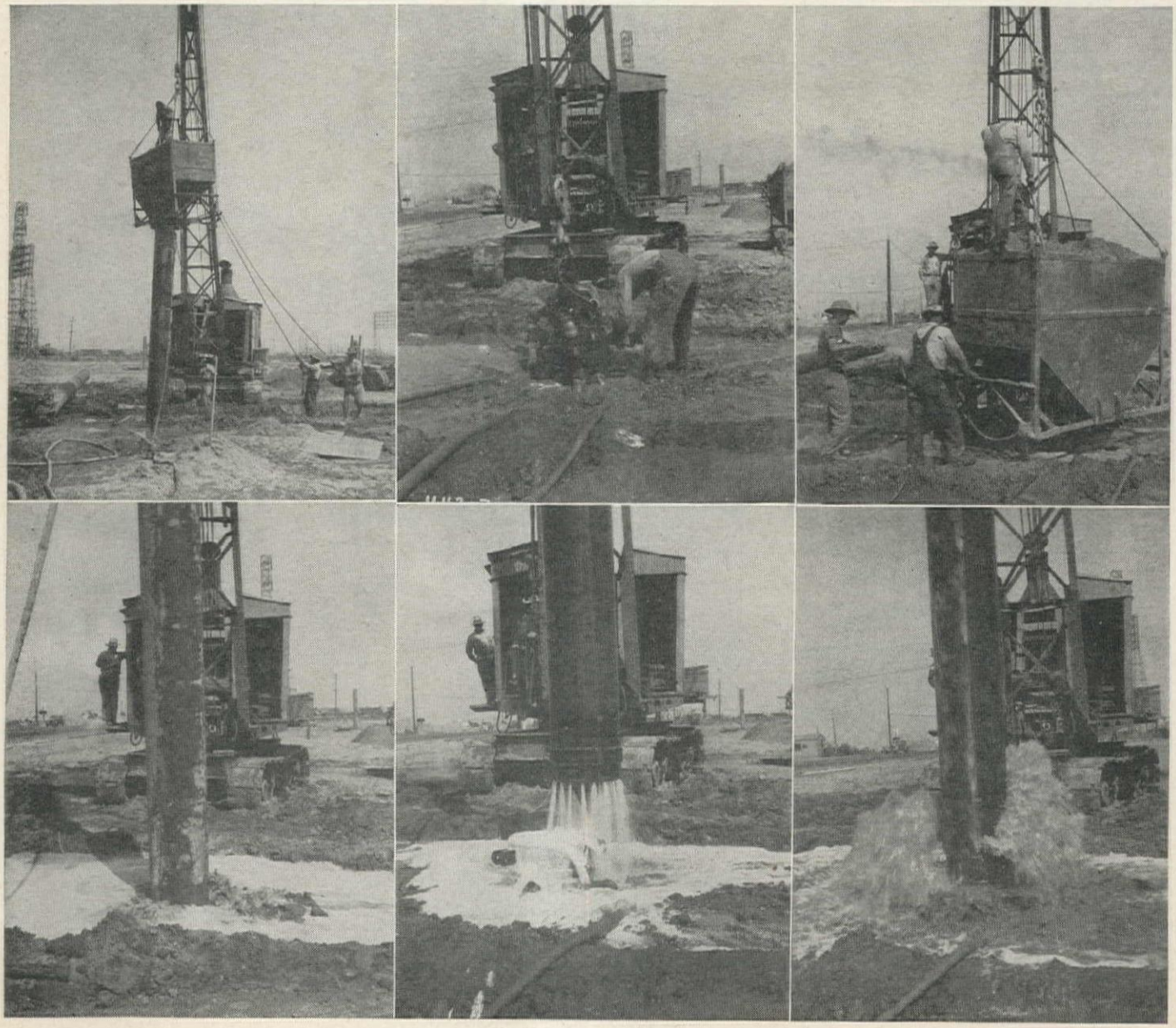
Construction details

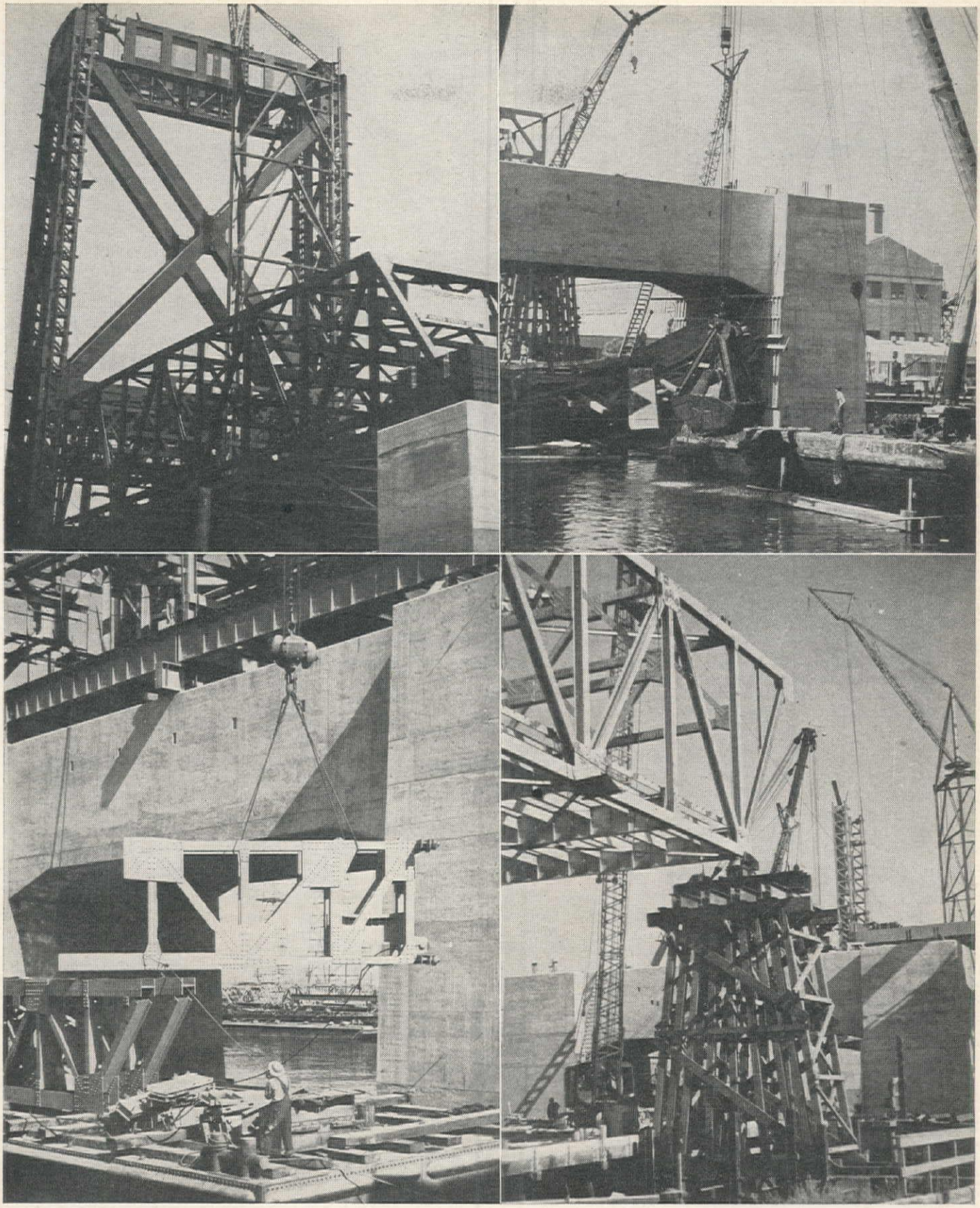
Piers and decks for the bridge and approach viaducts were poured by crane and bucket, using a Manitowoc Model 3900 with a 100-ft. boom and a 20-ft. jib. Forms for deck slabs were built in panels to permit six or seven re-uses of the forms. The concrete bridge deck was poured in two 20-ft. strips, mechanically screeded and vibrated by specially adapted highway equipment. Paving on sections other than the bridge is of asphaltic concrete.

In 19 months of construction, no workman was killed and the only serious injury caused was by a falling pipe.

Other contractors who had a part in the construction of the Freeway included Macco Construction Co., Clearwater, which paved 2.1 mi. between Henry Ford Ave. and Willow St. at a contract cost of $1,141,080; Macco also constructed an overhead crossing over the Union Pacific Ry., at a cost of $599,-121; E. W. Elliott Construction Co., Lynwood, at a cost of $849,357, built the overcrossing of the Union Pacific, Southern Pacific, and Pacific Electric tracks at Anaheim St.; Oberg Bros., Inglewood, constructed the Anaheim St. approach overhead crossing at Nicholson Ave., at a cost of $264,297; and James I. Barnes Construction Co., Santa Monica, built the roadway and structures on the

TO STABILIZE foundations, underground water storage was tapped and holes backfilled with clean, coarse sand to allow drainage under increased pressures. Consecutive pictures show loading sand in outer casing, preparing to pull inner jet from outer casing, placing sand in outer casing from sand hopper, jetting casing into position, removing inner jet casing from outer shell, and removing outer casing while backfilling with sand. Note displacement of water by sand backfill.





CONSTRUCTION PHASES OF the Schuyler Heim Bridge Upper left, south approach span and lift tower, practically completed; upper right, demolishing falsework on north river pier, dredge in foreground digging trench for cable crossing of Cerritos Channel; raising girder sections for lift tower, these sections were transported to Cerritos Channel by rail, transferred to barge and then lifted by cranes to position, lower left; construction of north approach span, lower right, one half at a time, with temporary timber support at the center. Steel was fabricated by Columbia Steel Co., erected by American Bridge Co. One interesting feature of the job was the number and variety of cranes constantly in use.

KEY PERSONNEL on the Heim Bridge are, l. to r.: G. L. CURTIS, project engineer for United Concrete Pipe Co.; RALPH A. BELL, project manager and joint venturer; CAPT. H. E. WILSON, officer in charge of construction for 11th Naval District, until September; and CMDR. J. W. FRORATH, project manager for the Navy on the job.

Pacific Coast Highway between Dominguez Channel and San Gabriel Ave., about 0.7 mi., including the overpass at the Freeway, for a contract cost of $1,672,000.

Project's history

The Navy first became interested in the Terminal Island situation early in 1941—months before the Pearl Harbor attack. At that time there were two lanes of auto traffic and a single railroad track over the bascule bridge across Cerritos Channel. Naval officials realized that the congestion caused by Terminal Island shipyard traffic was serious. In addition to the shipyards, traffic went to and from fish canneries, oil terminals and other industries. Traffic carried by the San Pedro ferry was and is negligible. Various agencies aided in scientific analysis of the situation by making traffic studies and charts to show traffic patterns.

In 1942 the Navy decided to remedy the situation. Inasmuch as materials were scarce, the Navy could build only a temporary swing bridge of four lanes where the new bridge now stands. (It was a part of the United Concrete contract to remove this old bridge carefully and return salvaged material to the Navy Department.) The Navy people anticipated a traffic increase during the war but they could do nothing more about it. The new swing bridge was soon overloaded, although the greatest congestion developed at the intersections of Henry Ford Ave. with Anaheim St. and the Pacific Coast Highway (US 101).

To relieve traffic congestion in 1944 the Navy built a concrete pontoon bridge over Cerritos Channel where it opens into the sea at the east end of Terminal Island (WCN, July 1945).

As evidence of the congestion in the area, present morning traffic on Henry Ford Ave. paralleling the new Freeway consists of the following: south-bound traffic—three lanes on the mainland, two on the bridge, and five on the island; north-bound traffic — one lane all the way. Afternoon traffic is just the reverse in number of lanes. The railroad track also parallels Henry Ford Ave. and crosses the drawbridge beside the highway.

Idaho Power Plans Big Plant on Snake River

A $17,000,000 power plant, with four generators having a combined capacity of 100,000 kw., is to be built by the Idaho Power Co. on the Snake River three miles west of Bliss, Ida., in view of delays encountered in winning authorization for the concern's projected Oxbow dam near Huntington, Ore., company president C. J. Strike revealed at the end of August.

Just a few days after Strike's announcement, the Oregon Grange filed a formal protest with the Oregon state hydroelectric commission, contending that the Oxbow plant would imperil irrigation rights of southeastern Oregon farmers and might delay construction of the federal government's proposed Hell's Canyon dam.

Strike, in disclosing that an application for a license to build the Bliss plant had been filed with the Federal Power Commission, asserted that abandonment of the application for the Oxbow site is not contemplated but he added that the company's generating needs will make it imperative to give the Bliss project priority.

Declaring that "a forecast of future power requirements, including service to the phosphate industry, indicates the necessity for further additions to the company's generating facilities," Strike explained that licenses for construction of the Oxbow plant had been applied for in June but that "delays beyond the company's control will apparently make it impossible to obtain authorizations for development of the Oregon site in time to meet load requirements."

Idaho Power officials envision completion of the first two units of the Bliss plant, with a generating capacity of 100,000 kw., by the summer of 1950. Meanwhile the company's 16,500-kw. project at Upper Salmon in the Hagerman valley is to be in operation this fall, and completion of the firm's Lower Salmon and Malad plants, in the same section of Idaho, is scheduled for autumn, 1949.

Check Washington Testing Machine

FIRST TESTS run on the new 2,000,000-lb. testing machine, installed during the past summer at the University of Washington, Seattle, consisted of a comparison between sand bearing and three-edge bearings tests of reinforced concrete culvert pipe. The testing machine is the largest in the Northwest and one of two in the country having new design features to improve rigidity of the columns and provide greater accuracy.

Special flex plates tie the yoke to the transverse beam providing maximum horizontal rigidity with practically no vertical restraint. Triangular guides keep horizontal movement to the minimum and make it possible to lock the crosshead in position. Flaring of the columns from a point one-third the distance from the top to the base of the machine affords minimum deflection when testing long specimens that force the columns to act as cantilever beams.

The machine is to be used for tension and compression testing as well as transverse testing. It will take specimens up to 10 ft. wide, 20 ft. high, and (for transverse testing) 80 ft. long. Considered to be one of the most advanced hydraulic universal testing machines built, it will permit the testing of materials for all six forces and six moments. The machine was built by The Baldwin Locomotive Works.

The university plans to devote the machine to special research on aircraft wing panels, various tests for the timber industry, and to other work for industries of the Northwest. The concrete pipe tests just completed were the first to be run on the new machine and involved tests on four sizes of pipe from 36 to 72 in. diameters to determine what relationship exists between the three-edge bearing and sand bearing methods of testing for compressive strength. Tests were run for the Washington State Highway Department with the cooperation of the Concrete Pipe & Products Association. Prof. F. B. Farquharson is in charge of the materials testing research program at the University of Washington.

Portrait of a Man With a Plan

Here is presented a glimpse into the life and motives of the planner who has envisaged possibly one of the greatest engineering projects ever conceived—Meet John Reber of the Reber Plan, staggering design for San Francisco Bay Area development, which might—or might not—be a dream

By BETTY THOMPSON
San Francisco, Calif.

THE REBER PLAN for the San Francisco Bay Area has been called the greatest engineering project ever conceived. John Reber, the man who envisaged this tremendous plan, not only isn't an engineer, but most of his life has been spent producing and directing amateur theatricals.

To the lay mind this fact is as astounding as if Billy Rose were to appear before the Atomic Energy Commission with a defense against the Bomb. Engineers, on the other hand, more readily appreciate that a dreamer who could conceive a Reber Plan is not apt to be found in the ranks of a profession bounded by cold hard facts. And anyone taking the trouble to study the Plan is immediately struck by its essential simplicity and practicality as well as by its magnitude.

The great Plan

Very briefly, the Reber Plan visualizes two wide earthen dikes or moles containing many-laned highways and rail lines, one connecting the downtown areas of San Francisco and Oakland, the other running between Point Richmond in the Eastbay and Point San Quentin in Marin County. Construction of the moles would form fresh water lakes in the upper and lower arms of the Bay, connected by a ship channel. A series of locks would admit ocean-going vessels from the remaining salt water central area of the Bay into this channel and dredge filling would create 20,000 ac. of sorely needed new industrial land along the Eastbay shore.

The Plan, which solves for all time the vexing problem of transportation between the Bay Cities, also presents the complete and simplest answer to the question of salt water intrusion of the Sacramento Delta areas, and offers a constant and ample supply of cheap fresh water not only sufficient for all municipal needs but with a surplus that could be shared with surrounding valleys and perhaps even Southern California. It pictures a Grand Central Terminal for rail, ship, bus and air travel, underground hangars for planes and submarines and the creation of vast new recreational areas. The military value of bomb-resistant moles and water supply is self-evident.

According to the estimates of the late L. H. Nishkian, one of San Francisco's foremost construction engineers and a wholehearted advocate of the Plan, the entire project could be built for $200,000,000—or scarcely twice the cost of any of the bridge crossing proposals now being considered—and it could be toll-free, being paid for by sale of the newly created industrial areas.

The planner

The man with the temerity to dream of such a project was born fifty-odd years ago in Logan, Ohio. His father was a druggist and doctor who constantly fostered his son's intense curiosity about nature, people and events. At sixteen, John Reber became a teacher with the extra-curricular duty of dispensing news, and it was to him that people turned (locally) for details of the San Francisco earthquake of 1906. In telling about it he became fascinated by thoughts of the West and shortly after, at the age of 18, he accepted an opportunity to go to San Francisco with a traveling theatrical company.

From that time until a few years ago, when he gave up all other work to devote himself to furthering his Plan, Reber toured California as a producer and director of amateur theatricals. He has visited every town large enough to support a theater, explored every river, talked with every type of citizen, until now he boasts an intimate knowledge of the state that is second to none.

Reber is a slender, restless man of average height, practically inseparable from a worn portfolio that bulges with maps, figures, documents and notebooks. His face is pale with deep grooves pinched in the forehead and his expression is one of tense preoccupation. In conversation his words tend to tumble forth in a sometimes overwhelming flood—apparently in an effort to keep pace with his thoughts—but his sincerity and earnestness are so evident

WITH CHARACTERISTIC energy, enthusiasm, and sincerity, JOHN REBER explains the details of his plan for the comprehensive development of San Francisco Bay before a committee of senators and representatives. He has never been loath to present his story to the highest authorities, and usually has won a favorable response.

that they carry considerable conviction.

Men who have come to know him through a shared interest in the project regard Reber with genuine affection although they occasionally deplore his rather natural inclination to shoulder the entire burden of official presentations of his Plan. Incidentally, his own name for it has always been "The San Francisco Bay Project."

The primary elements of this gigantic scheme occurred to Reber back in 1907, when he chafed at the delay caused by ferry crossings of the Bay and the inconvenience of not being able to reach San Francisco by train. Calmly ignoring any practical problems involved, he decided that the only logical way to insure an uninterrupted flow of mass transportation was to link the entire area by land. This resolved itself into the construction of earthen dikes—one between San Francisco and Oakland, the other connecting the Eastbay with Marin.

To the wars

In intervals between shows and during hops from one town to the next, Reber mulled over this idea for the next few years. Then, with the advent of World War I, he shelved it temporarily and came forth with a plan for nothing less than the elimination of trench warfare! During every war, of course, civilians proffer myriad helpful suggestions of which possibly two per cent may be of some value, but in Reber's case official reactions were distinctly out of the ordinary.

Democratically, he wrote several letters announcing that he had a solution to the stalemate on the Western Front, and addressed them to ex-President Theodore Roosevelt, President Wilson, Secretary of War Baker, General Pershing, Hiram Johnson and a Col. George K. McGunnigle, then stationed at San Francisco. In July, 1918 he was drafted, in his own words "the rookiest rookie you ever saw."

Then, incredibly, on the day his company was being sent overseas Reber was called from the ranks to tell his plan to Col. McGunnigle. Twenty-four hours later, with a brand-new promotion to Corporal, he was en route to Washington. There he presented his plan to the assembled War College, and heard it hailed as "the greatest thing yet for winning the war!"

On grounds of military secrecy Reber refuses to say more than that his plan was an engineering project to cost $890,000,000, and that it was to be ready for the Spring push of 1919. With the November 11th Armistice it ended up in the War Department files. But Reber adds that in the early days of World War II, he discussed it with Lord Halifax during the latter's visit to San Francisco, with the idea that it might be used in the defense of Britain.

The Plan again

When the first war was over Reber went back to the theatrical business, and resumed his interrupted dream for the Bay Area. During the preliminary discussions over California's Central Valley Project he read Walker Young's report on Salt Water Barriers to protect the fresh water supplies of the Delta counties, and realized how his own plan could be enlarged in scope to offer abundant water as well as unhampered transportation. With the vision of two fresh water lakes and a connecting ship channel the essentials of the Reber Plan were complete, although he later added the polishing touches of airports, submarine bases, recreational areas and so on.

Reber is a confirmed letter-writer and he knew he had something worth writing about. Letters began to pour out in a steady stream. He talked about the Plan to everyone who would listen. Eventually he gave up the theatrical business and for the last decade has spent every waking moment fighting to get his Plan before the public.

In 1933 he met Congressman Free who was sufficiently interested to take him to see Herbert Hoover. The ex-President studied the Plan carefully for some time, then looked up and said, "Why gentlemen—what is wrong with it?"

"Do you consider it feasible?" he was asked.

"It is absolutely thorough and sound from an engineering standpoint," was the reply. Mr. Hoover believes that it would take only seven years to replace the salt water in the lower lake with fresh.

About this time, L. H. Nishkian became interested and devoted some engineering study to the Plan, with the result that he became one of its most wholehearted supporters. Today these supporters number men like Mr. Hoover; General Philip Bruton, former Corps of Engineers chief in the Pacific Area; Senator Sheridan Downey; Rear Admiral John W. Greenslade; Publisher George Cameron; Editor John Pickett and numerous other Bay Area residents. These are hard-headed, eminently realistic men with no personal axes to grind. They have the vision to appreciate the value of a project that "has everything," and argue that since the Plan is certain to be adopted eventually, why waste time and money on stopgap structures.

For John Reber, the sole reward would be the deep personal satisfaction and vindication of seeing his dream finally materialize. Aside from his own money, only $126 has ever been spent on the Plan. This was received from the San Francisco Junior Chamber of Commerce for the printing of some leaflets. In fact, at the time of the joint Army-Navy Board hearings in 1946, the only public material available on the Reber Plan was a reprint of a 1942 article from *Western Construction News*.

Men call John Reber a dreamer, yet it is inescapable that every objection to the Plan — and these are few — has been answered by competent authorities. No one has ever been able to prove that it wouldn't do the job it sets out to accomplish, and the strongest force against it seems to be the inability of timid minds to grasp a project of such staggering size.

How Reber happened to be the man to conceive such a project is difficult to explain, although he points out that he has been engaged in creative planning since the age of 18 and that after all, the ability to visualize a theatrical spectacle with all details dovetailing is much the same as being able to see the entire Bay Area functioning as a whole.

Reber's wife is a woman with a rare understanding of the compulsion that has driven her husband to sacrifice everything else to his Plan. His main hobby is gardening — which he calls "mind-washing" — but Mrs. Reber says that even in the garden she dares not interrupt him, for in the midst of weeding or transplanting he still will be figuring out some new angle in his campaign to reach the public.

The Rebers have seen many discouragements and setbacks but their blackest moment occurred just four months ago on the death of L. H. Nishkian, the brilliant engineer who was one of the most powerful advocates of the project. That was the day when they might have given up their long fight. Recently, however, they have found new hope in the formation of a non-profit organization whose aim is to spread information concerning the Reber Plan.

When asked what he considers the high point of his life to date, Reber unhesitatingly says it was back in 1918, when he expounded his plan for the elimination of trench warfare to the War College and was informed by a ranking officer, "This means the capture of the 450,000 Germans besieging Paris." But he adds that this will be nothing to the day he hears that the Reber Plan at last has been accepted.

New Tire Testing Site Will Be in California

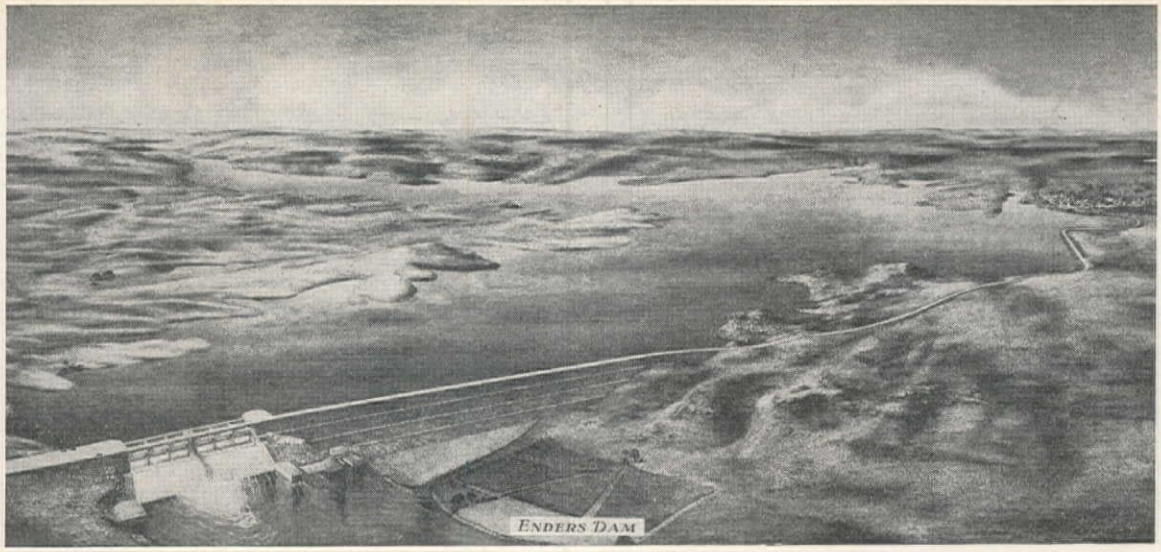
SIX HUNDRED and forty acres of land near Lancaster, Calif., formerly held by War Assets Administration, has been purchased by the United States Rubber Co. to be used as national tire testing headquarters.

The announcement made by Richard Beresford, test supervisor, stated that preliminary plans call for the erection of repair shop buildings, a warehouse, and staff headquarters. Facilities for wear and skid testing of tires will also be built on the site located 7 mi. north of Lancaster on Highway 66.

Tire testing operations, which heretofore have been scattered throughout the United States, will be concentrated in the Lancaster area, Beresford said. He gave the reason for the move as being the great varieties of weather and contrasting differences in terrain found there which makes the area ideal for the purpose.

He said that any climatic condition to be found in the United States, from desert heat to seacoast humidity, could also be found in the Lancaster area.

The new headquarters were formerly used as an army airfield, called Liberty Field, where British flyers were trained.



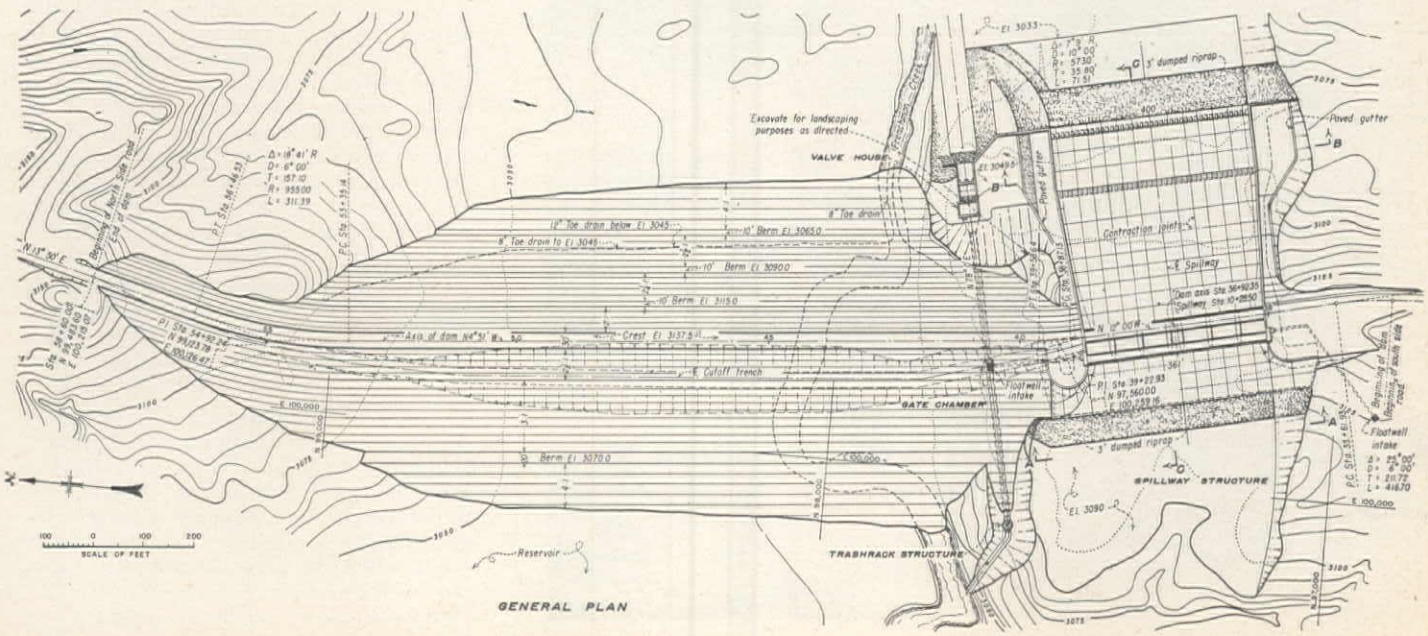
Enders Dam Work Progresses

Third unit of the vast Missouri Basin Project to be constructed in southwestern Nebraska involves cutoffs, blanketing and inverted filters to solve abutment problems—Sudden settlement of dike foundation prevented later by pre-saturating loess deposits of which the area is composed

By ELLIS L. ARMSTRONG
Engineer, Bureau of Reclamation
Denver, Colorado

THE THIRD UNIT of the vast Missouri Basin Project to be placed under construction by the Bureau of Reclamation is Enders Dam, located 50 mi. northwest of McCook in southwestern Nebraska across Frenchman Creek, a tributary of the Republican River. Construction was begun in Feb., 1947 and is expected to be completed before 1950. As a part of the Frenchman-Cambridge Unit, the multi-purpose reservoir is designed primarily to provide irrigation storage and flood control. Silt retention, recreational benefits, and fish and wildlife protection will also be furnished. The dam, a 100-ft. earthfill, will provide a reservoir with a total capacity of 83,000 ac. ft., of which 39,000 ac. ft. is for flood control alone, 34,000 ac. ft. is for irrigation storage, and 10,000 ac. ft. is dead storage for silt retention.

The Frenchman-Cambridge Unit of the Missouri Basin Project extends along the Republican River and Frenchman Creek valleys for a distance of about 110 mi. These valleys are 1 to 3 mi. wide. Irrigation water will be supplied to 35,500 ac. of presently unirrigated land and supplemental water will be furnished for 17,600 ac. which, although now under irrigation, have an insufficient supply. The project is also designed to control damaging floods along the valleys of the Republican River and tributaries which, in the past, have been very destructive. In the flood of 1935, 112 lives were lost, 20,600 head of livestock were drowned, and the damage to rural property exceeded $9,000,000. Other major structures of the Frenchman-Cambridge Unit soon to be placed under construction include two more multi-purpose reservoirs. Medicine Creek Reservoir, with a capacity of 129,000 ac. ft., is located 6 mi. north of Cam-



GENERAL PLAN

bridge, Neb., and will be formed by an earthfill dam, 102 ft. in height. Culbertson Reservoir will have a capacity of 170,000 ac. ft. and will be formed by an earthfill dam, approximately 100 ft. high and 1½ mi. long. It will be located 14 mi. west of McCook, Neb. Four diversion dams, enlargement and extension of two existing canals, four new canals, laterals for all new lands, rehabilitation of existing laterals, and drainage provisions are also part of the unit soon to be constructed.

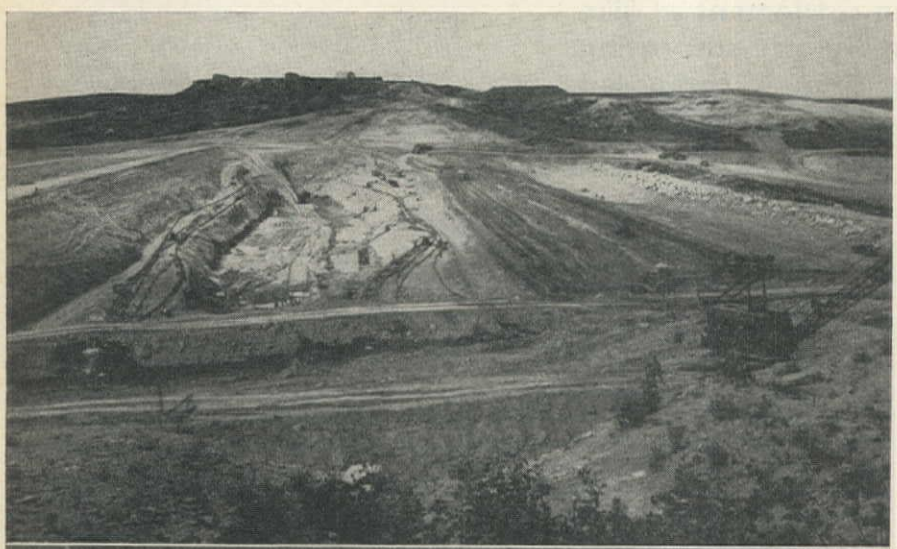
Design of Enders Dam

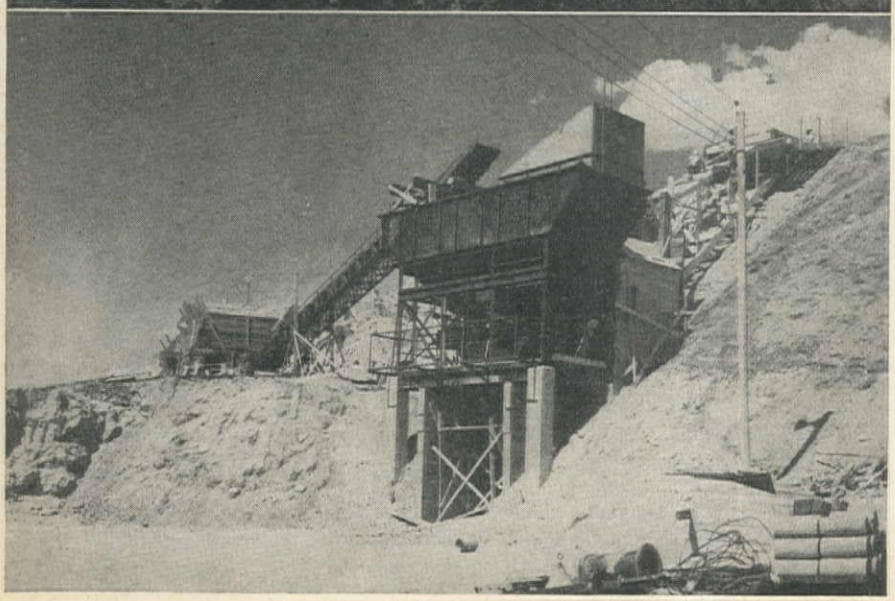
The principal features include the main dam embankment, 2,600 ft. long at crest elevation, and with a maximum height above river level of 100 ft.; a dike 6,400 ft. long with a maximum height of about 25 ft.; a concrete conduit outlet works; a 200,000-c.f.s. capacity, open channel, concrete-lined spillway; and the relocation of about 4 mi. of state highway. Major items of work include the excavation of 1,200,000 cu. yd. of earth and rock for the dam and dike foundations and for the outlet and spillway structures, excavation and transportation of 1,700,000 cu. yd. of material from borrow areas, placing and compacting 1,900,000 cu. yd. of embankment and backfill, placing 55,000 cu. yd. of concrete, and placing 7,200,000 lb. of reinforcing steel and metalwork.

Bids for the construction of the dam were opened on Sept. 4, 1946 and seven were received, ranging from $4,109,927 to $5,178,755. Award was made to the low bidder, the Wunderlich Contracting Corp. of Jefferson City, Mo., and they were given notice to proceed on Jan. 22, 1947, after some delay occasioned by the President's Public Works construction limitation order. The contract is scheduled to be completed in 1,150 days, or by March 17, 1950. However, the contractor plans to complete the construction about one year ahead of schedule.

The foundation and abutments for the dam consist of the Ogallala sediments overlain in the river bottom with 40 ft. maximum depth of river sands and gravels. The Ogallala formation is very erratic, ranging from clean, uncemented sands through partially cemented silts to some hard cemented sandstone rock. It is generally quite impervious except for the sand layers. Special treatment in the form of cutoffs and blanketing and inverted filters will be provided for the sand layers located in the abutments. A cutoff trench, 30 ft. wide in the bottom, will extend through the river deposited sands and gravels and through the overburden on the abutments to the Ogallala formation.

GENERAL VIEW of the Enders damsite looking toward left abutment, top, shows cofferdam at left with the cutoff trench excavation in progress, and the dumped rockfill section, right. Below, the concrete batching plant as it nears completion. Bulk cement will be stored at right; aggregate will be conveyed from bins at left.





Cross-section

The dam embankment section is 30 ft. wide at the crest. The upstream slope is 2½:1 for the upper 23 ft., which is above normal water surface, then 3:1 to a 20-ft. berm located 10 ft. below dead water elevation, then 4:1 to original ground surface. The downstream slope is 2:1 for the upper 23 ft., then 2¼:1 for 25 ft., then 2½:1 for 25 ft., and 4:1 to ground surface. Ten-foot berms are located at the breaks in slope to provide better protection from the intense rainfalls that occur in the vicinity.

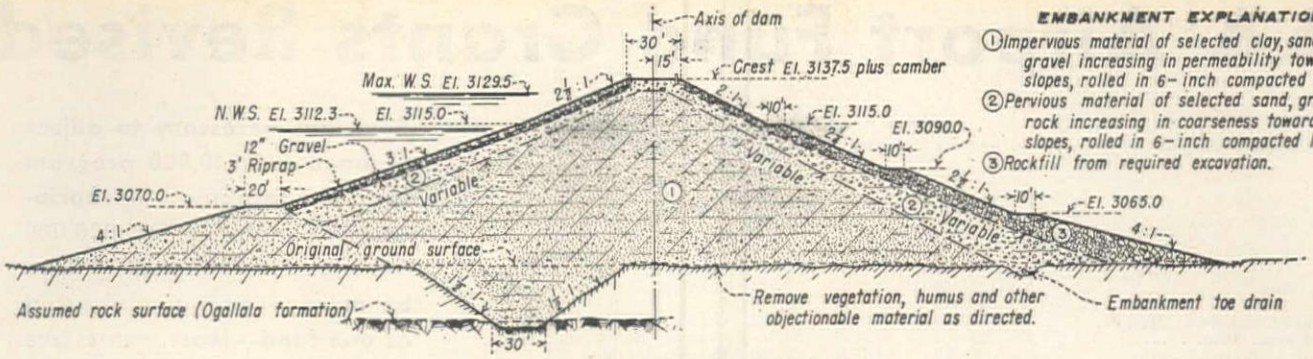
The main body of the dam will consist of rolled embankment of impervious material, compacted in 6-in. layers by sheepsfoot rollers. This section will be covered on the upstream and downstream slopes with a relatively small section of pervious sand, gravel, and rock, which in turn is covered by a dumped rock-fill section on the downstream slope. The upstream slope above the berm will be covered with a 1-ft. layer of gravel and 3 ft. of heavy rock riprap.

The impervious material will be obtained from required excavation and nearby borrow areas. The material, as an average, can be classified as a sandy loam, and has an average dry density of about 112 lb. per cu. ft., with a laboratory optimum moisture content of 12 per cent and a percolation rate of about 0.5 ft. per year or less.

The pervious sand and gravel material will be selected from required excavation and from borrow areas. The rock for the downstream slope protection will consist of the cemented Ogallala materials obtained from the required excavation for the spillway and outlet works. Rock riprap will be quarried from a quartzitic sandstone deposit located near Franklin, Neb., a distance of about 160 mi. from the dam. It will be transported to within 3 mi. of the damsite by railroad cars. Concrete aggregates are being obtained from a source near Ogallala, Neb., about 55 mi. north of the damsite, and are being transported to the site by trucks.

The dike section is also 30 ft. wide at the crest. A 3:1 upstream slope protected with a 3-ft. layer of riprap, and a 2:1 downstream slope covered with pervious materials are provided.

The dike foundation consists mainly of loess deposits about 60 ft. deep overlying the Ogallala sediments. As the loess material had a low density and moisture content, concern was felt regarding the possibility of sudden settlement when the loess became saturated from the reservoir. As a result of studies, provisions were made to saturate the



SECTION IN RIVER CHANNEL

foundation before construction of the dike, and items were included in the specifications for pumping 70 million gallons of water for this purpose.

Outlet works

The outlet works consists of a trash-rack structure located at the upstream toe of the embankment, a vertical shaft 40 ft. in height, and a 7-ft. diameter, concrete conduit extending from the shaft to the gate-chamber, located about 50 ft. upstream from the axis of the dam. A 6 by 7.5-ft. high-pressure slide gate will be located in the gate chamber from which an 84-in. diameter pipe, extending through an 11-ft., 6-in. horseshoe conduit, will lead to two 60-in. hollow-jet valves located in the valve house at the downstream toe of the dam. The valves will discharge into a stilling basin.

The plan for handling Frenchman Creek during construction consists of diverting the stream against the right abutment to allow stripping and foundation excavation to proceed while the outlet structure is being built. The 35-ft. high cofferdam, which forms the upstream portion of the embankment, is being constructed, and after the outlet conduit is completed, the stream will be diverted through it to permit the completion of the dam.

The spillway is a concrete lined open channel located on the right abutment. A 361-ft. wide gate structure is located at the crest of the dam. An uncontrolled outlet 13 ft. wide and 15 ft. high, with the crest at the top of the irrigation storage level, is located through the center pier of the gate structure. This outlet will limit a 14,000 c.f.s. peak flow, 30,000 ac. ft. volume, 3-day flood to a maximum flow below the dam of 2,000 c.f.s. Discharge for larger floods will be controlled by six 50 by 30-ft. radial gates, which provide a maximum discharge capacity of 200,000 c.f.s. The open channel widens to 400 ft. at the upper end of the stilling basin which discharges into the river channel. Dentated sills are located in the stilling basin and sheet steel piling, 30 ft. in length, will extend along the downstream edge of the stilling basin concrete lining.

The relocated highway will cross the dam and dike embankments. About 40,000 cu. yd. of excavation will be required for its construction.

By the first of October about 16 per cent of the construction had been completed. The stripping of the dam foundation was done and the excavation of the cut-off trench was near completion. The unwatering of the foundation necessary to allow cutoff trench excavation was accomplished by the use of well points. Approximately 5 c.f.s. were being pumped from the unwatering operations. Installation of drains and final cleanup work in the bottom of the trench to allow placing of embankment was in progress. The cofferdam had been completed except for the stream channel at the foot of the right abutment. Placing of embankment in the downstream section of the dam, towards the left abutment, was under way.

The excavation for the outlet works structure was completed and concreting operations are well advanced. Excavation for the spillway structure is in progress and concrete placing in the vicinity of the gate structure intake channel is expected to be started soon. The excavation work for the relocated highway is practically complete. The dike foundation has been stripped and pre-irrigated. This pre-irrigation was accomplished by constructing small levees across the foundation and containing the water in small ponds. A total of 87 million gallons of water was percolated into the foundation with only a small amount of settlement being recorded. The construction of the dike embankment was about 95 per cent complete October first.

Enders Dam was designed and is being constructed under the direction of Walker R. Young, Chief Engineer of the Bureau of Reclamation. The designs were completed under the general supervision of K. B. Keener, Chief of the Dams Division. The Frenchman-Cambridge Unit is located in Region 7 of which A. A. Batson is Regional Director. H. E. Robinson is District Manager. U. V. Engstrom is Construction Engineer in charge at Enders Dam.

The Wunderlich Contracting Corp. has combined with the James and Phelps Co. of Oklahoma City, Okla., for the construction of the dam. L. M. Bush is general superintendent for the contractor.

NW Power Contracts Executed

ONE-YEAR CONTRACTS calling for the delivery of up to 335,000 kw. of Bonneville-Grand Coulee power to five of the major private utility companies of the Pacific Northwest have been executed by the Bonneville Power Administration, the Pacific Power and Light Co., the Washington Water Power Co., the Portland General Electric Co., the Puget Sound Power and Light Co., and the Mountain States Power Co. The companies serve some 700,000 customers in Oregon, Washington and Northern Idaho.

BPA Administrator Paul J. Raver estimated the sale of prime power under the contracts will mean approximately $5,000,000 in guaranteed revenues to the federal government for the year ending Sept. 1, 1948. In the past, the major portion of the power involved in the transaction was sold to the private utility companies under temporary arrangements with no guarantee from the Power Administration as to its continued availability.

Execution of the contracts jointly represents the largest single sale of power by the Power Administration in its 10-year history. It is the first time that all of the major private utility companies in the region have had firm power contracts with the federal government.

Under terms of the new contracts, the Washington Water Power Co. and Pacific Power and Light Co. jointly will receive 97,000 kw. of firm power, Puget Sound Power and Light Co., 97,000 kw.; Portland General Electric Co., 130,000 kw.; and Mountain States Power Co., 11,000 kw., in addition to 10,000 kw. already being received under a previous contract.

The companies have agreed to deliver over their systems for Bonneville's account Columbia River power to a number of public agencies and rural electric cooperatives in the area in addition to agencies already receiving federal energy by this method.

The new contracts serve to apportion to the several companies the power available for the group in accordance with an agreement on division of the power which was reached by the companies among themselves.

The firm power is being sold to the companies at $17.50 per kilowatt year. They will pay 2½ mills per kilowatt hour for surplus power, when available.

CAA Airport Fund Grants Revised

Loc. and Name of Airport	Class Pres.	Class Prop.	Funds Sponsor	Funds Federal	Funds Total	Proposed Work
ARIZONA						
Tombstone Mun.	0	3	$10,261	$15,000	$25,261	Land, grading, Adm. bldg.
Chandler Mun.	0	2	15,197	16,103	31,300	Land, grading, lighting, Adm. bldg.
Flagstaff Mun.	0	3	39,120	60,000	99,120	Land, fencing, Adm. bldg. and utilities.
Williams Mun.	1	3	15,788	24,212	40,000	Grading.
Holbrook Mun.	2	2	14,346	22,000	36,346	Paving.
Clemenceau-Cottonwood Mun.	1	3	16,302	25,000	41,302	Grading, lighting.
Clifton-Morenci Mun.	2	3	23,475	36,000	59,475	Grading, paving, lighting.
Mesa, Falcon Field	1	3	28,150	43,170	71,320	Paving, lighting.
Tucson Mun.	5	5	33,908	52,000	85,908	Adm. bldg. and lights.
Phoenix, Sky Harbor	4	6	819,310	900,000	1,719,310	Land, pave and grade.
Prescott Mun.	4	4	19,562	30,000	49,562	Adm. bldg. and apron.
CALIFORNIA						
San Jose Mun.	1	3	115,187	107,313	222,500	Drainage, runway paving and apron.
San Diego, Gibbs Mun.	0	2	260,846	250,000	510,846	Land, constr. rnys, taxiways, parking apron.
Rohnerville Apt.	0	3	99,763	94,074	193,837	Grade, drain, fence, rny. and taxiway and apron paving.
Santa Ynez Mun.	0	2	62,613	57,990	120,603	Land, runway paving, Adm. bldg.
Del Mar Mun.	1	2	12,233	14,367	26,600	Grade, pave, light, land, Adm. bldg.
Calexico Mun.	1	3	29,671	35,000	64,671	Grade, pave, access road.
San Luis Obispo Co.	3	3	12,846	15,154	28,000	Grading.
Modesto Mun.	3	3	57,011	38,689	95,700	Land, grade, pave, Adm. bldg.
Merced Mun.	3	3	10,063	11,870	21,933	Paving apron and taxiway, landscape.
Hanford, Kings Co. No. 1	0	2	76,034	50,656	126,690	Land, grade, pave, Adm. bldg.
Los Banos Mun.	2	2	11,470	13,530	25,000	Grade and pave runway.
Jackson, Amador Co.	0	1	20,967	24,733	45,700	Grade, pave, light, utilities.
Quincy-Gansner	0	2	22,940	27,060	50,000	Grading.
Avenal	2	2	23,629	27,871	51,500	Pave rny., lighting, Adm. bldg.
Calipatria Mun.	2	2	21,380	25,220	46,600	Grading, paving.
Borego Valley	0	2	23,368	12,332	35,700	Land, pave.
Fullerton Mun.	1	1	12,846	15,154	28,000	Pave, light, Adm. bldg.
Cedarville Mun.	0	1	1,800	600	2,400	Land.
Adin Mun.	0	1	562	188	750	Land.
Dunsmuir Mun.	1	2	9,176	10,824	20,000	Grading.
Tulare Airpark	1	2	9,375	3,125	12,500	Land.
Tulare Airpark	1	2	11,250	3,750	15,000	Land.
Pixley	0	1	6,000	2,000	8,000	Land.
Big Pine	0	1	2,667	3,146	5,813	Grading.
Lone Pine	0	2	5,505	6,495	12,000	Grading.
Three Rivers	0	1	1,875	625	2,500	Land.
San Francisco Mun.	7	7	1,705,465	1,700,000	3,405,465	Land, grade, pave, lights.
Los Angeles Mun.	4	6	847,746	1,000,000	1,847,746	Grade, pave, lights.
Oxnard Flight Strip	4	4	6,882	8,118	15,000	Lights.
Oakland Mun.	5	5	241,608	285,000	526,608	Pave, light.
San Diego, Lindbergh	8	8	233,130	275,000	508,130	Grade, pave, hi-intensity lighting.
Ontario International	5	5	42,387	50,000	92,387	Grade and light.
Napa, Napa Co.	4	4	12,716	15,000	27,716	Grade and pave.
Hayward Mun.	5	5	4,239	5,000	9,239	Taxiway, utilities.
Porterville Mun.	5	5	7,250	7,283	14,533	Land, Adm. bldg., utilities.
Crescent City	4	4	5,506	6,494	12,000	Adm. bldg.
Santa Monica Mun.	4	4	105,968	125,000	230,968	Grade, light.
Bishop	5	5	1,242	1,465	2,707	Adm. bldg. and miscellaneous.
Montague, Siskiyou Co.	6	6	4,239	5,000	9,239	Grade, pave.
Ukiah	3	3	9,176	10,824	20,000	Grade, pave.
Santa Rosa, Sonoma Co.	4	4	12,716	15,000	27,716	Grade, light and auto parking area.
Concord, Buchanan Fld.	4	4	36,704	43,296	80,000	Grade, pave, light.
Little River	4	4	3,441	4,059	7,500	Adm. bldg.
Banning Mun.	4	4	15,000	17,694	32,694	Grade, pave.
COLORADO						
Canon City, Fremont Co.	2	3	19,973	20,827	40,800	Land, develop land, area and facilities.
Craig Mun.	1	3	33,669	32,112	65,781	Land, improve existing site.
Durango-La Plata	3	3	60,262	61,298	121,560	Land, Adm. bldg., and facilities
Grand Junction Mun.	3	3	38,752	44,300	83,052	Develop land. area & facilities.
Grand Junction Mun.	3	3	80,915	92,500	173,415	Adm. bldg., apron paving and develop bldg. area.
Pueblo Mun.	3	3	38,635	44,165	82,800	Apron, develop land. area and facilities.
Trinidad	2	3	131,139	148,699	279,838	Land, develop land. area and facilities.
Montrose	3	3	23,404	20,866	44,270	Land, office bldg. & facilities.
Denver, Stapleton	5	5	392,161	448,305	840,466	Pave N/S rny. and lights.
Gunnison, Gunnison Co.	0	3	41,475	44,375	85,850	Site, grade, drain, stabilize rny., Adm. bldg.
Rifle Mun.	2	3	14,055	14,245	28,300	Site, grade, drain, stabilize land. strip, apron.
Greeley Mun.	2	3	37,473	25,832	63,305	Addl. land, grade land. strips, Adm. bldg.
Kremmling Apt.	S-1	3	14,318	15,000	29,318	Land, grade, drain, land. strip.
Monte Vista Mun.	2	3	5,646	6,454	12,100	Adm. bldg., taxiway & apron.
Walden, Jackson Co.	3	2	4,700	3,550	8,250	Site, grade, drain.
Hugo Mun.	S-1	1	3,261	1,539	4,800	Site and perform engineering.
Loveland Mun.	0	1	22,522	11,834	34,356	Site, condition field, clear approaches.
Limon Mun.	0	2	12,671	10,118	22,789	Site, grade, drain, landing strips.
IDAHO						
Pullman-Moscow	4	4	27,100	35,000	62,100	Taxiways, apron.
Lewiston-Nez Perce Co.	4	4	95,833	123,767	219,600	Taxiways, apron, lighting, Adm. bldg.
Twin Falls	2	3	361,877	461,096	822,973	Addl. land, grade, drain, pave, light, Adm. bldg.

Revisions necessary to adjust planned $65,000,000 program for 1948 to actual appropriation by Congress of $32,500,000 —Funds for 1947 and 1948 to be merged and administered as one fund—Most grants are for small airports

T. P. WRIGHT, Administrator of Civil Aeronautics, has approved the revised Federal-aid airport program to be undertaken from funds appropriated for fiscal years 1947 and 1948, $45,000,000 and $32,500,000, respectively, which have been merged and are to be administered as one fund.

The program calls for the construction or improvement of 908 airports in the entire nation at an estimated cost to the Federal Government of $66,569,590, with local or state sponsors providing an additional $70,235,095. In the 11 Western states, 256 are to be improved, and 5 in Hawaii and 6 in Alaska will be affected.

Wright declared in approving the program that the CAA's primary consideration was aeronautical necessity and that he had not been able to program all projects for which the CAA had received applications for Federal assistance. The CAA has on file now a backlog of approximately $250,000,000 in requests for Federal aid.

The apportionment of $77,500,000 of Federal funds appropriated for the fiscal years 1947 and 1948 consists of $4,087,500 for administrative purposes, $3,315,500 for projects in the Territories, $52,572,750 according to state area and population and $17,524,250 for a discretionary fund.

The proposed Federal expenditures comprise $49,997,985 of the $52,572,750 apportioned among the states as provided in the Federal Airport Act, plus $14,818,530 from the discretionary fund and $1,753,075 from funds apportioned to Alaska, Hawaii, and Puerto Rico.

The program announced includes 896 projects for the continental United States, of which 725 are for the construction or improvement of the Class 1, 2, and 3 category and 171 are Class 4 or larger, of which only 3 involve the construction of new Class 4 or larger airports. Of the $66,569,590 of proposed Federal expenditures, $35,295,055 is for construction or development of Class 3 or smaller airports, and $31,274,535 is for Class 4 and larger.

Of the total amount of $140,702,885 of Federal and sponsor funds for the development and improvement of airports, the percentage of cost as related to land is 10 per cent (the Government participates only to the extent of 25 per cent for land acquisition), 8 per cent for

buildings and 82 per cent for other items of airport construction, such as installation of high intensity runway lights, construction of runways for instrument approaches, construction of additional runways and new airports.

The revision published herewith is designed to adjust the $65,000,000 program for 1948, submitted to Congress in February, to the actual appropriation of $32,500,000, and to reallocate some 1947 funds not used as planned.

Detailed Study Made of Aviation in California

CALIFORNIA's phenomenal development in the field of aeronautics, an inventory and evaluation of the state's aviation facilities and a projection of aviation trends and future requirements in the state are presented in a report to Governor Warren by Col. Warren E. Carey, chief of the state's Airport Master Planning Staff. Major emphasis is placed on the development of facilities for private fliers as offering the greatest opportunity for expansion under suitable impetus.

The 445-page report entitled "California Airports" is the result of a year of research and study on the part of Col. Carey and his staff, functioning under the State Reconstruction and Reemployment Commission.

Highlights of the report are:

1. Following detailed study and treatment of communities, counties and areas, a final conclusion is reached that California needs 96 new airports and must improve and enlarge 110 existing airports by 1950. If this is accomplished, it is recommended that 59 more new airports be established and 41 existing facilities be improved and enlarged between 1950 and 1955. This would mean a net total of 581 airports for the state by 1955, an increase of 45 per cent in total capacity over 1946.

2. With from 5 to 6 per cent of the nation's population, California has consistently contributed at least 10 per cent to the nation's total aircraft ownership, pilots and airline traffic.

3. Airport planning through a state agency is essential to take advantage not only of the physical features, but to provide the action necessary for obtaining Federal funds.

4. Wartime expansion of air power greatly augmented California's aircraft industry, enabling it to produce half of the nation's aerial might. Wartime aviation training installations were more numerous in California than in any othed state except Texas. These training fields are now becoming a major asset to civil aviation.

5. California now has 47 active or standby military airports, 202 publicly owned or sponsored civil airports, 207 commercial airports, privately owned, and upward of 100 private airports. Of these 409 are considered available as civil airports, which presently accommodate 8,500 civil aircraft.

Loc. and Name of Airport	Class Pres.	Class Prop.	Funds Sponsor	Funds Federal	Funds Total	Proposed Work
Burley Mun.	2	3	64,410	79,590	144,000	Land, taxiway and apron paving, Adm. bldg.
Gooding Mun.	3	3	10,256	13,246	23,502	Addl. taxiways and apron, drainage.
Bonners Ferry, Boundary Co...	0	1	15,614	9,386	25,000	Land, grade, drain and turf.
Craigmont	0	1	13,647	10,376	24,023	Land, grade and turf.
Grangeville	3	2	6,794	8,775	15,569	Grade, drain, surf. land. strip.
Orofino Mun.	1	1	3,306	3,551	6,857	Land, grade, drain and surface land. strip.
Albion Mun.	0	1	5,264	5,936	11,200	Land, grade, drain and turf 1 land. strip.
Rexburg Mun.	0	2	13,840	15,000	28,840	Land, grade, drain and turf 1 land. strip.
Homedale Riverside	0	1	3,431	4,000	7,431	Land, grade, drain and turf.
Jerome	1	1	7,823	6,787	14,610	Land, grade, drain, turf and bldgs.
Hazelton	0	1	5,381	4,075	9,456	Land, grade, drain, turf and buildings.
Dubois	2	2	3,272	3,507	6,779	Land, remove obstr. and grade, drain and turf.
Driggs, Teton Peak's Fld.	0	1	7,070	8,739	15,809	Land, grade, drain, Adm. bldg.
St. Maries' Mem.	1	1	9,609	11,691	21,300	Land, grade, drain, turf 1 land. strip.
Ashton	0	1	9,472	7,921	17,393	Land, grade, drain and turf.
Blackfoot Island Airpark	0	1	18,404	19,096	37,500	Land, grade, drain and turf.
Caldwell Mun.	2	2	13,311	17,191	30,502	Stabilize runways, taxiways and apron.
Challis Mun.	1	1	4,897	6,324	11,221	Grade, drain, turf, and improve bldg. area.
Mackay	1	1	2,121	2,379	4,500	Land, grade, drain and turf.
Priest River Mun.	1	1	1,419	1,832	3,251	Grade, drain, turf.
Aberdeen Mun.	1	1	774	1,000	1,774	Grade, drain, turf.
Council Mun.	0	1	2,618	3,382	6,000	Grade, drain, turf.
Preston Mun.	1	1	9,946	12,054	22,000	Land, grade, drain and turf.
New Meadows	0	1	2,618	3,382	6,000	Grade, drain, turf.
Kellogg, Shoshone Co.	2	2	5,473	5,918	11,391	Land, grade, drain and surf. 1 land. strip.
Shelley Mun.	0	1	2,287	1,338	3,625	Land, grade, drain and turf.
Riggins, State Emerg. Fld.	0	1	3,049	2,500	5,549	Land, grade, turf and drain.
Whitebird, State Emerg. Fld.	0	1	3,049	2,500	5,549	Land, grade, turf and drain.
Downey	0	1	2,052	1,500	3,552	Land, grade, turf 1 land. strip, drain.
Kooskia Mun.	0	1	2,445	1,000	3,445	Land, grade, turf and drain.
Nez Perce	0	1	3,044	3,500	6,544	Land, grade, turf and drain.
Cottonwood	0	1	5,780	4,302	10,082	Land, grade, turf and drain.
Emmett Mun.	1	1	500	645	1,145	Removal of obstructions.
Kamiah Mun.	2	2	2,211	2,856	5,067	Improve. of Adm. area facil. and access road.
Nampa, Ritchey Fld.	1	1	31,739	30,211	61,950	Land, improve Adm. area facilities, lighting.
Roberts	0	1	1,542	914	2,456	Land, grade, turf and drain.
Saint Anthony Mun.	1	1	20,000	25,830	45,830	Grade, drain, surf. land. strip, provide apron.
Paris, Bear Lake Co.	3	3	9,359	12,087	21,446	Access road and Admin. bldg.
Shoshone	0	1	3,448	4,452	7,900	Grade, drain, remove obstruction, Adm. bldg.
Weiser Mun.	2	2	10,942	12,695	23,637	Land, grade, drain, stabilize 2 land. strip.
MONTANA						
Shelby	0	2	122,188	140,978	263,166	Grade, drain, pave, light, bldgs.
Kalispell, Flathead Co.	3	3	24,268	28,000	52,268	Grade, drain, bldgs. & utilities.
Hamilton	S-1	2	4,268	4,432	8,700	Land, grade, drain, turf.
Roundup	2	2	4,340	4,477	8,817	Land, grade, drain, turf.
Dillon	1	2	6,393	5,407	11,800	Land, grade, drain, turf.
Circle	S-1	1	7,429	8,571	16,000	Grade, drain, pave, bldgs.
Ronan	0	1	16,365	9,035	25,400	Land, grade, drain.
Sunburst	0	1	20,497	21,803	42,300	Land, grade, drain, pave, bldgs.
Twin Bridges	1	1	2,786	3,214	6,000	Grade, drain, fence, utilities.
Jordan	2	2	930	1,070	2,000	Grade, drain, turf.
Glendive	1	2	6,043	6,357	12,400	Land, grade, drain.
Chester	0	1	7,500	6,200	13,700	Land, grade, drain, turf.
Harlowton	1	2	1,453	815	2,268	Land, fence and utilities.
Plentywood	0	2	20,429	23,571	44,000	Grade, drain, pave, bldgs.
Sidney	1	2	32,501	37,499	70,000	Grade, drain, pave, light.
Hardin, Big Horn Co.	1	2	9,286	10,714	20,000	Grade, drain, pave, bldgs.
Red Lodge	S-1	1	1,115	1,285	2,400	Grade, drain, turf, bldgs.
Bridger	0	1	929	1,071	2,000	Grade, drain, turf, and fence.
Chinook	0	2	6,143	5,857	12,000	Land, grade, drain, pave.
Harlem	1	1	1,971	2,029	4,000	Land, grade, drain, fence.
Turner	0	1	5,214	4,786	10,000	Land, grade, drain, fence.
Townsend	2	2	5,329	4,671	10,000	Land, grade, drain, fence.
Columbus	2	2	3,250	3,750	7,000	Grade, drain, fence and pave.
Conrad	1	2	4,643	5,357	10,000	Grade, drain, fence.
Superior, Mineral Co.	2	2	2,490	1,130	3,620	Land and fence.
Thompson Falls	1	1	1,857	2,143	4,000	Grade, drain.
Phillipsburg	0	1	7,004	7,096	14,100	Land, grade, drain, turf, pave, bldgs.
Havre City-Co.	3	3	4,643	5,357	10,000	Lighting.
Forsyth	1	2	6,024	6,950	12,974	Grade, drain, pave.
Helena Mun.	4	4	333,686	385,000	718,686	Grade, drain, pave, light.
Great Falls Mun.	5	5	23,215	26,785	50,000	Repair water system.
Miles City Mun.	4	4	9,192	10,388	19,580	Apron, taxiways, land.
Anaconda	0	2	25,158	24,842	50,000	Land, grade, drain, pave, bldgs.
Bozeman, Gallatin Fld.	3	3	103,075	118,925	222,000	Grade, drain, pave, light, bldgs.
Butte	3	3	177,675	205,000	382,675	Grade, fence, bldgs., pave.
Polson	S-1	1	23,908	17,492	41,400	Land, grade, drain, turf.
Deer Lodge	0	2	3,245	3,745	6,990	Grade, drain and utilities.
Livingston Mun.	3	3	7,429	8,571	16,000	Bldgs., utilities.
NEVADA						
Las Vegas, Clark Co.	0	4	570,000	950,000	1,520,000	Grade, pave, light, Adm. bldg.
Elko Mun.	4	4	5,308	6,347	11,655	Land, grade, pave.
Overton Public	0	3	30,666	45,110	75,776	Grading, land.
Wells Mun.	0	2	3,709	1,237	4,946	Land.
Eureka Mun.	0	1	15,000	25,000	40,000	Preparation of site.
NEW MEXICO						
Hobbs, Lea Co.	3	3	121,343	160,000	281,343	Adm. bldg., grade bldg. area.
Portales Mun.	0	1	54,732	50,000	104,732	Land, constr. 3 strips, fence, road.
Roswell Mun.	4	4	121,343	160,000	281,343	Adm. bldg.

Loc. and Name of Airport	Class Pres.	Class Prop.	Funds Sponsor	Funds Federal	Funds Total	Proposed Work
Grants Mun.	0	1	40,641	42,504	83,145	Land, constr. 3 strips, fence, road and Adm. bldg.
Clayton Mun.	2	3	26,544	35,000	61,544	3 strips, pave apron.
Rudioso, Cree Meadows	2	2	45,504	60,000	105,504	2 strips, pave runway, fence.
Las Vegas Mun.	4	4	45,504	60,000	105,504	Water system, apron, runway and drainage reconstr.
Gallup Mun.	2	3	149,458	197,072	346,530	One paved runway and taxiway apron.
Farmington Mun.	3	3	11,376	15,000	26,376	Grade and stabilize 1 runway.
Tucumcari Mun.	3	3	11,376	15,000	26,376	Access road, water system.
Silver City Mun.	0	1	55,415	71,590	127,005	Land, one strip, mark & fence.
Raton, Crews Fld.	3	3	30,336	40,000	70,336	Adm. bldg., access road, water system.
Estancia Mun.	1	1	10,946	10,000	20,946	Land, grade 3 strips, fence.
Vaughn Mun.	2	2	11,376	15,000	26,376	Land, grade 3 strips, fence.
Mountainair Mun.	1	1	8,903	11,000	19,903	Land, grade 3 strips, fence.
Santa Rosa Mun.	2	2	13,618	15,000	28,618	Land, grade 2 strips, fence.
Lordsburg Mun.	2	3	11,376	15,000	26,376	Pave apron.
Artesia Mun.	5	5	11,376	15,000	26,376	Access road.
Albuquerque, Kirtland Fld.	8	8	75,840	100,000	175,840	Lighting, grade, fence, pave apron.
Clovis, Hillcrest	1	3	39,350	35,630	74,980	Land, constr. 3 strips, fence.
OREGON						
Roseburg Mun.	0	3	94,994	121,000	215,994	Grade and surface runway, clear approaches.
Hood River Co.	1	1	26,915	17,500	44,415	Purchase site, grade, drain, clear obstrs.
Lexington Mun.	2	2	5,495	7,000	12,495	Grade, drain, stabilize land. strip.
Joseph Mun.	1	2	8,029	9,170	17,199	Land, extend land, strip, grade and drain.
Prairie City	0	1	3,689	3,500	7,189	Acq. land, grade, drain and stabilize land. strip.
John Day	1	1	3,000	1,000	4,000	Purchase site.
Burns Mun.	3	3	6,987	8,900	15,887	Adm. bldg.
Bend Mun.	2	2	9,420	12,000	21,420	Constr. 3rd land. strip.
Baker Mun.	3	3	4,004	5,100	9,104	Taxiway.
La Grande Mun.	3	3	12,325	15,700	28,025	Taxiway and parking apron, water supply, remove obstr.
Albany Mun.	2	2	32,043	30,500	62,543	Land, grade and drain land. strip, constr. parking apron.
The Dalles	0	SPB	14,916	19,000	33,916	Mooring & servicing facilities.
Merrill Mun.	0	1	9,970	12,700	22,670	Grade, drain and stab. land. strip, constr. parking apron.
Nehalem Mun.	0	1	25,486	24,000	49,486	Land, grade and drain land. strip.
Portland Mun.	4	4	137,428	175,051	312,479	Addl. aprons, taxiways, parking areas, high intensity lighting.
Salem, McNary Fld.	5	5	35,328	45,000	80,328	Utilities, apron, taxiways.
McMinnville Mun.	4	4	10,991	14,000	24,991	Additional apron areas.
Klamath Falls Mun.	5	5	25,908	33,000	58,908	Repair apron, access road and parking area.
Medford Mun.	4	4	10,991	14,000	24,991	Taxiways and runways.
Troutdale	4	4	11,365	14,475	25,840	Addl. utilities, grading, drain.
Newport	4	4	5,058	6,442	11,500	Adm. bldg.
The Dalles Mun.	4	4	2,512	3,200	5,712	Landscaping, auto parking area.
Milton Mun.	0	1	10,251	8,825	19,076	Land, grade and drain land. strip.
Coquille, Arago	0	1	20,867	16,000	36,867	Land, grade and drain land. strip, constr. parking apron.
Vale Airport	1	1	1,962	2,500	4,462	Remove obstructions.
Denmark, Curry Co.	4	4	3,532	4,500	8,032	Improve Adm. bldg.
UTAH						
Price, Carbon Co.	2	3	72,971	119,871	192,842	Grade, rny. and txwy. paving.
Nephi Mun.	2	2	32,526	53,430	85,956	Grade, pave and light.
Vernal Mun.	1	3	74,730	120,060	194,790	Land, grade, rny. paving, lighting.
Spanish Fork-Springville	2	2	31,440	47,720	79,160	Land, grade, rny. paving, lighting.
Tremonton Mun.	1	2	24,522	35,570	60,092	Land, grade, rny. paving, lighting.
Kanab Mun.	0	3	23,873	29,790	53,663	Land, grade, apron paving.
Salina-Gunnison	0	2	18,318	24,200	42,518	Land, grade, apron paving.
Green River Mun.	0	2	29,399	42,010	71,409	Land, grade, pave runway.
Beaver Mun.	3	2	41,096	67,510	108,606	Grade, drain, apron paving.
St. George Mun.	2	2	11,109	18,250	29,359	Grade, drain, apron paving.
Moab	2	2	13,447	22,090	35,537	Grade, drain, apron paving.
Roosevelt Mun.	3	2	35,420	51,900	87,320	Grade, drain, apron paving.
Duchesne Mun.	3	2	24,055	35,980	60,035	Grade, drain, apron paving, acq. land.
Torrey	0	2	12,272	20,160	32,432	Grade, drain, apron paving.
Myton	1	1	12,290	20,190	32,480	Grade, drain, fence.
Monument Valley	1	2	12,740	20,045	32,785	Land, grade, apron paving.
Salt Lake City Mun.	4	4	76,094	125,000	201,094	Grade, pave and light.
Ogden, Hinckley	4	5	30,761	50,000	80,761	Grade and pave.
Provo Mun.	5	5	30,522	50,140	80,662	Pave, grade and fence.
Logan, Cache Co.	3	4	26,566	43,640	70,206	Drainage.
Delta Mun.	4	4	6,203	10,190	16,393	Grade, pave apron.
Milford	2	2	18,871	31,000	49,871	Clear, grade, drain, constr. land. strip.
WASHINGTON						
Seattle-Tacoma	5	5	788,395	850,000	1,638,395	Adm. bldg., paving, roadways, utilities.
Pullman-Moscow	4	4	32,460	35,000	67,460	Drain, pave runway, taxiway and apron, Adm. bldg.
Aberdeen-Hoquiam	4	4	27,825	30,000	57,825	Addl. apron, Adm. Bldg.
Bellingham Mun.	4	4	9,275	10,000	19,275	Extend lighting.
Lester	0	1	57,840	61,800	119,640	Land, one land. strip, parking apron.
Tacoma	1	3	420,195	305,000	725,195	Addl. land, grade and drain, pave rnws, txwys and apron.
Willapa Harbor	0	2	48,230	52,000	100,230	Grade, pave runway, taxiway and apron, Adm. bldg.
Concrete	0	1	15,275	15,800	31,075	Land, clear, grade & stabilize.
Bandera	0	1	41,740	45,000	86,740	Land, one land. strip, parking apron.
Whitman Co. Mem.	0	1	20,035	21,600	41,635	Grade, stabilize and turf 2300-ft. landing strip.

(Table continued on page 102)

6. The ratio of aircraft to airports is unduly high in only two places: The major metropolitan centers of Los Angeles and the San Francisco peninsula.

7. An increase of 300 per cent in aircraft registrations in California by 1950 is indicated, which will tax existing facilities in most metropolitan areas. An additional increase of 267 per cent is predicted between 1950 and 1955, rendering present facilities totally inadequate.

8. Feeder-line air transport is destined to connect many of the smaller communities of the state with each other and with the major population centers. This will hasten the development of remote areas both in business and social relations, as did good highways.

9. Private flying offers the greatest opportunity for expansion under suitable impetus. For the immediate future, numerous small airports with comparatively modest facilities are advocated rather than a smaller number of more elaborate airports.

10. The rapid development of air cargo is of major importance to Western agriculture and industry, particularly in marketing perishables and products scarce in other parts of the nation. Special cargo airports are recommended.

11. With tourist traffic one of California's largest sources of income, a system of airports convenient to scenic and recreational attractions would have economic importance by increasing the flow of tourists.

For purposes of detailed studies with relation to aviation, the report divides the state into fourteen areas as follows: San Diego County, Los Angeles Metropolitan area, Desert Region, Kern County, Mid-coastal counties, Fresno metropolitan area, Inyo and Mono counties, Stockton metropolitan area, San Francisco Bay area, Sacramento metropolitan area, Redwood Empire, Chico-Red Bluff area, Modoc Plateau region, Shasta-Cascade region.

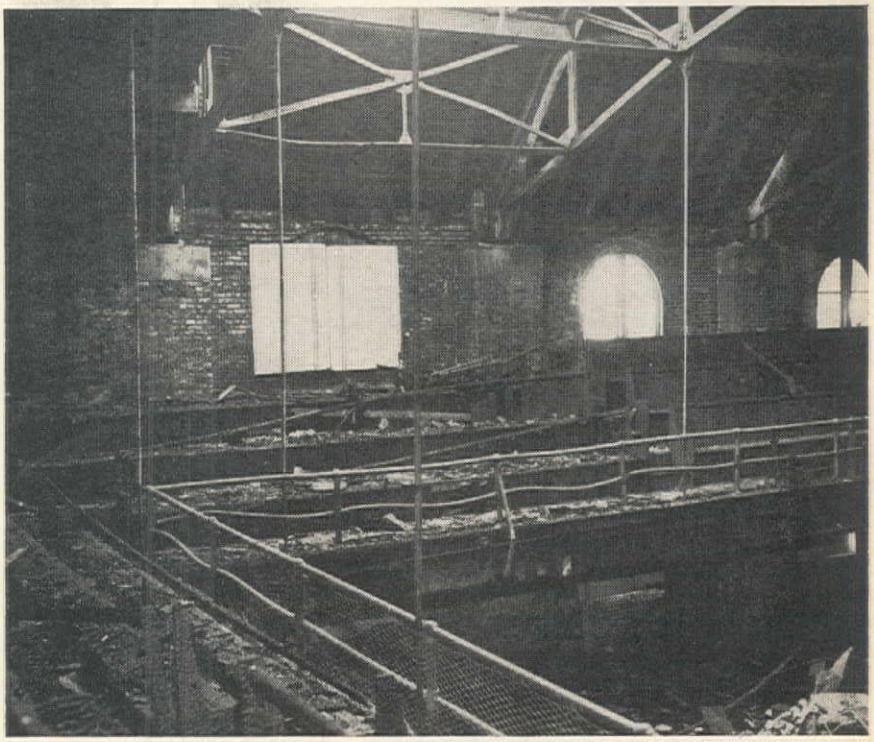
Studies of these areas include natural characteristics, covering geography, topography, land usage and climate; economic conditions, covering agriculture, business, industry and recreational facilities; and all available information pertaining to airports, aviation facilities and airplane ownership and use with relation to population, area coverage and other factors.

Highway Department May Get New Office Building

OREGON STATE HIGHWAY Department may get a new office building for its headquarters in Salem as a result of approval by the State Board of Control for construction of the building on either of two sites. Tentative plans for the building have been under consideration since before the war, but development has been postponed several times. The proposed building would be 5 stories high and located a block north of the capitol building. Total estimated cost is set at about $3,000,000 including property costs.

Repair Armory in Record Time

Fire damaged Seattle armory, urgently needed as quarters, is speedily rebuilt in only 34 days—System of organization and excellent cooperation were responsible for the accomplishment



DAMAGE BEFORE repairs to the Seattle National Guard armory were undertaken is shown by this photo of the west corner interior. Portion of the balcony shown was completely removed and new stairs joined to the remainder. Bent sway bracing between roof trusses was straightened by heat applications.

AN EXCEPTIONAL record in speed of completion has just been accomplished in repairing the fire damaged old National Guard armory in Seattle by Alton V. Phillips, general contractor of Seattle, and a group of nearly a dozen subcontractors affiliated on the project with the general contractor. The job, which involved removal of burned debris, straightening of steel roof trusses in place, reconstruction of drill hall floor and roof, and construction of a small apartment, was completed in 34 working days.

The old National Guard armory in Seattle is a 43-yr. old structure of brick masonry frame. In recent years it has been occupied by the state department of employment security, but in March of this year the south corner was badly damaged from a fire which apparently started from a temporary space heater installed at the corner of the drill hall. Since that time the structure had stood open to the weather which added to the destruction caused originally by fire and water.

Floor and roof damage

Damage caused by the fire was confined to an area about 91 by 70 ft. in the drill hall floor, and a corresponding area of the roof. Inside dimensions of the hall are 100 by 200 ft., with the 100-ft. clear span of the roof being supported by ten steel arch trusses connected in pairs with sway bracing and buttressed into brick masonry columns. Two pairs of the roof trusses and the connecting sway bracing were damaged.

The floor support system, consisting of structural timbers, was not seriously damaged, even where the floor and subfloor had been burned sufficiently to drop through into the basement of the building. Much of this corner of the basement was buried in literally tons of partially burned unemployment compensation records, all of which had to be excavated as a part of the contract.

The proposal, offered by the Washington state department of public institutions for reconditioning the structure in order that it might once more be occupied by the employment security department, called for replacement of about half the roof and repair of the remainder, straightening four steel roof trusses, removing a portion of a damaged balcony, reconstruction of the destroyed portion of the drill hall floor and reconditioning of the remainder, and construction of a 4-room apartment in the basement. Because the employment security department was in urgent need of quarters, time was made the essence of the contract and the state reserved the right to make an award to the contractor offering to complete the work in the shortest time.

Award on time basis

The low bidder, submitting a lump sum price of $61,900, offered to complete the work in 175 days, while Phillips with a price of $62,600 offered to complete the work in 90 days. The third and last bidder was about $15,000 higher with a time of 100 days. In negotiation the low bidder offered to reduce his time to 90 days, whereupon Phillips, being granted the same opportunity to adjust his figure, cut his completion time to 45 working days. The contract was finally awarded to Phillips on this basis and the notice to proceed was received late in the afternoon of Aug. 27.

From this point on the work was principally a race against time. On the morning of Aug. 28 a crew was put to work cleaning up the roof preparatory to reconstruction, since it was clearly apparent that an early fall rain would result in additional damage to the interior of the structure, as long as it remained open to the weather, and further complicate the problem of completion within an already short schedule.

Straightening of the roof trusses was accomplished by use of the heat method without removing the trusses from position. Some members of the sway bracing were replaced with new steel, but the original trusses were worked back into position through the application of heat (and occasionally pressure) by means of a No. 10 Victor burning torch. Reconstruction of the roof was completed, due in part to the speed with which the work was prosecuted and in part to a drier than average September, before any rain of consequence occurred, eliminating any possibility of further damage.

Excavating the partially burned paper from the basement proved to be nearly a major operation. A 12-ton dump truck made ten trips from the building with this material alone. Reconditioning of the two-thirds of the drill hall floor which was not burned beyond salvaging was another difficult job. Nearly all of the floor was badly buckled from the water used to extinguish the fire and subsequent exposure to the weather for more than five months. Where the floor could not be forced down into position, slots were cut in the flooring with a Skilsaw, after which the floor could be nailed down with square tapered nails.

Job organization

The contractor maintained a crew of 60 to 80 men during the short life of the job, working 24 hr. per day during some of the more time consuming operations, but holding strictly to a 5-day working week with no work on holidays. Nine

EXTENT OF RECONDITIONING required is indicated by this view of the drill hall after completion. The new flooring patch in left foreground is 91 ft. wide by 70 ft. long. The flooring crew with equipment shown worked on a 24-hr. schedule to complete the work within the time limit. Interior was sand-blasted before painting.

subcontractors were employed for some twelve different operations, but in order to assure himself that the work would move forward continuously without interruptions, the general contractor employed all common labor himself, and provided all services required by the subcontractors.

This method of organization provided the most flexible means of operation, making it possible for the general contractor to supply labor to the particular operations most in need of it at any particular time in order to keep the job on schedule. In this same manner all crafts were supplied with any extra services required which normally might have been performed directly by the subcontractor's employees. During the painting, for instance, erection and movement of scaffolding was performed directly by the general contractor's forces so that painters could work continuously without interruptions.

Through this system of organization, and excellent cooperation on the part of all subcontractors and the architect, the project was completed and accepted by the State representative on Oct. 15, just seven weeks to the day after receipt of notice to proceed with the work. Discounting Saturdays, Sundays, and Labor Day this period included 34 working days, eleven less than specified by the contractor. Work was accomplished at the average rate of more than $1,840 per day, an exceptional record for this type of undertaking.

Supervision

Close supervision over the job was maintained at all times by Phillips, himself, with the assistance of his engineer, Art Brown. Spot decisions necessary to rapid completion of the work were made by Walt Wyberg, job representative for the architect, William Arild Johnson and Associates of Everett, Wash. The work was performed for the Washington state department of public institutions of which Jack Ballew is director. F. A. Pockswin, supervisor of purchasing, awarded the contract.

The subcontractors, whose cooperation made completion of the job within the specified time limits possible, included the following: electric, Hennum Electric Co.; plumbing and heating, West Coast Plumbing and Heating Co.; roofing and sheet metal, Independent Sheet Metal Corp.; glazing, Acme Glass Co.; painting, Saxon Painting Co.; flooring, R. C. Douglas Floor Co.; millwork, Totem Lumber Co.; window frames and sash, Lynnwood Cabinet Works; plastering, William Hiller.

Record Number of Farms Electrified

MORE THAN 2¼ million American farms still did not have electric service on June 30, 1947, according to the annual Rural Electrification Administration estimates announced recently by the Department of Agriculture. The estimates show that about 400,000 farms obtained central station service during the year prior to June 30. The connections made up to that date are the largest for any year on record, bringing the total of electrified farms from 54.3 to 61.0 per cent.

While 39.0 per cent of farms in the entire nation remain unelectrified, Montana still has 58.6 per cent without electric service, and Nevada and Wyoming both have 45.0 per cent unelectrified. Well below the national average for unelectrified farms are Washington with 5.4 per cent, Oregon, 7.8 per cent, and California, 9.7 per cent.

Present line construction activity is at the highest peak yet recorded. REA borrowers alone constructed 72,000 mi. of distribution lines and connected nearly 300,000 rural consumers to their systems during the 1947 fiscal year. New applications for loans to finance additional lines continue to come into REA at the rate of a million dollars a day. The agency began the fiscal year with a loan application backlog of nearly $300,000,000.

Commenting on the situation which the 1947 estimates reveal, REA Administrator Claude R. Wickard stated that the future task of rural electrification will be more difficult because areas easy to electrify for the most part have been electrified.

The estimate of unelectrified farms is required each year under the REA Act of 1936, as a basis for state allotments of half of the loan funds newly made available by Congress. Of the $225,000,000 in loan funds authorized for 1948, half is thus being allotted. In addition, the Administrator may approve loans from the unallotted half up to 10 per cent in any one state.

Recent loans approved by the REA for electrification in the West are the following: Verde Electric Cooperative, Cottonwood, Ariz., $65,000 for the acquisition and rehabilitation of 2 mi. of line serving consumers in Smelter City, and for 18 mi. of new line to serve 43 rural consumers; McCook Public Power Dist., McCook, Neb., $485,000 for completion of previously approved construction, for rebuilding lines damaged by recent floods and for 326 mi. of line to serve 401 rural customers; Northern Idaho Rural Electric Rehab. Assn., Sandpoint, $365,000 for system improvements, for completion of previously approved construction and for 69 mi. of line to serve 211 rural consumers; B-K Electric Coop., Seymour, Tex., $250,000 for headquarters facilities and for 153 mi. of line to serve 225 rural consumers.

Other loans approved for electrification in Texas are these: McCulloch Co. Elec. Coop., Brady, $78,000 for system improvements and for 28 mi. of line to serve 120 rural consumers; Pedernales Co. Elec. Coop., Johnson City, $262,000 for system improvements and for 171 mi. of line to serve 377 consumers; Johnson Co. Elec. Coop. Assn., Cleburne, $175,000 for system improvements and 77 mi. of line for 221 rural consumers; and Karnes Elec. Coop., Karnes City, $264,000 for 245 mi. of line to serve 435 rural consumers.

Licenses Asked Under Reciprocity Agreement

TWO CIVIL ENGINEERS of Portland have filed suit against the Idaho Board of Engineering Examiners in an attempt to force the board to issue licenses under a reciprocity agreement existing between the engineering boards of Idaho and Oregon. Clifford C. Warren and Walter J. Higgins, both of Portland, in separate suits have asked the Ada County court to review their applications to the Idaho board for engineering licenses under the reciprocity agreement after the board refused to issue licenses.

Construction Design Chart

LXXXIX... Estimating Size of Square Spread Footings

By JAMES R. GRIFFITH
Civil Engineer
Seattle, Washington

THE EFFECTIVE depth d of a footing is usually controlled by the unit shear at a distance d from the face of the column or pedestal. The designer must then make successive trials in the absence of any means of obtaining approximate sizes before beginning his computations. The accompanying chart was plotted from results averaged from a large number of designs all of which had a pedestal. The function of the chart is to give reasonable approximations and is not intended for accurate final results.

In order to illustrate the use of the chart and show the comparative accuracy of results obtained by using it, I have drawn a solution line for the following assumed conditions, some of which were used for the illustrative problem in the May, 1947, issue:

$f'_c = 2{,}000$ p.s.i.
$f_s = 20{,}000$ p.s.i.
Allowable soil pressure = 3 tons per sq. ft. = 6 kips per sq. ft.
Total column load = 155 kips
Column size = 14 in. square
Pedestal size = 17 in. square by 18 in. high

The following results will then be noted on the accompanying chart:

Footing size = 5.3 ft. square
Overall depth = 16.2 in.
Reinforcing steel (each way), $A_s = 2.46$ sq. in.

The footing size, for convenience, will be taken as 15' 3" square by 16 in. deep. We will then have

D.L. of pedestal $= \left(\frac{17 \times 17}{144}\right) 150 \times 1.5 = 400$

D.L. of footing $= \frac{16}{12} (5.33 \times 5.33)\ 150 = 5680$

D.L. Total 6130 lb. = 6.1 kips
Column load = 155
Total load = 161.1 kips

Then

$$\text{Required footing area} = \frac{161.1}{6} = 26.9 \text{ sq. ft.}$$

Required footing size $= \sqrt{26.9} = 5.2$ ft. square which will be seen to check the 5.3 ft. dimension obtained by means of the chart.

Deducting the dead-load of the footing from the gross soil pressure, we would then have

$$\text{Net soil pressure} = \frac{155.4}{5.25^2} = 5.82 \text{ kips per sq. ft.}$$

Figuring 3-in. coverage on ⅝-in. round reinforcing bars, the effective depth would be

$d = 16 - (3 + \frac{5}{16}) = 12.69$ in.

The area, for computing the total shear V, outside the critical perimeter would be

$$A = (5.25)^2 - \left(\frac{42.38}{12}\right)^2 = 15.13 \text{ sq. ft.}$$

The total shear at the critical perimeter would then be

$V = 5.82 \times 15.13 = 88.0$ kips.

and

$$v = \frac{V}{bjd} = \frac{88.0 \times 1{,}000}{4(42.38) \times \frac{7}{8} \times 12.69} = 46.9 \text{ p.s.i.}$$

This value would be satisfactory where special anchorage of longitudinal reinforcing is provided, under which the conventional code would allow $v = 0.03\ f'_c = 60$ p.s.i. The chart is based on such assumed conditions.

The critical section in flexure will be taken at the edge of the pedestal. The total bending moment on one-fourth of the projecting footing, based on the net soil pressure being applied at the centroid of the trapezoid, is

$M = 533{,}000$ in. lb.

Then

$$K = \frac{M}{bd^2} = \frac{533{,}000}{63 \times (12.69)^2} = 51.8$$

Using this value of $K = 51.8$ on the chart published in November, 1940, the following values may be obtained:

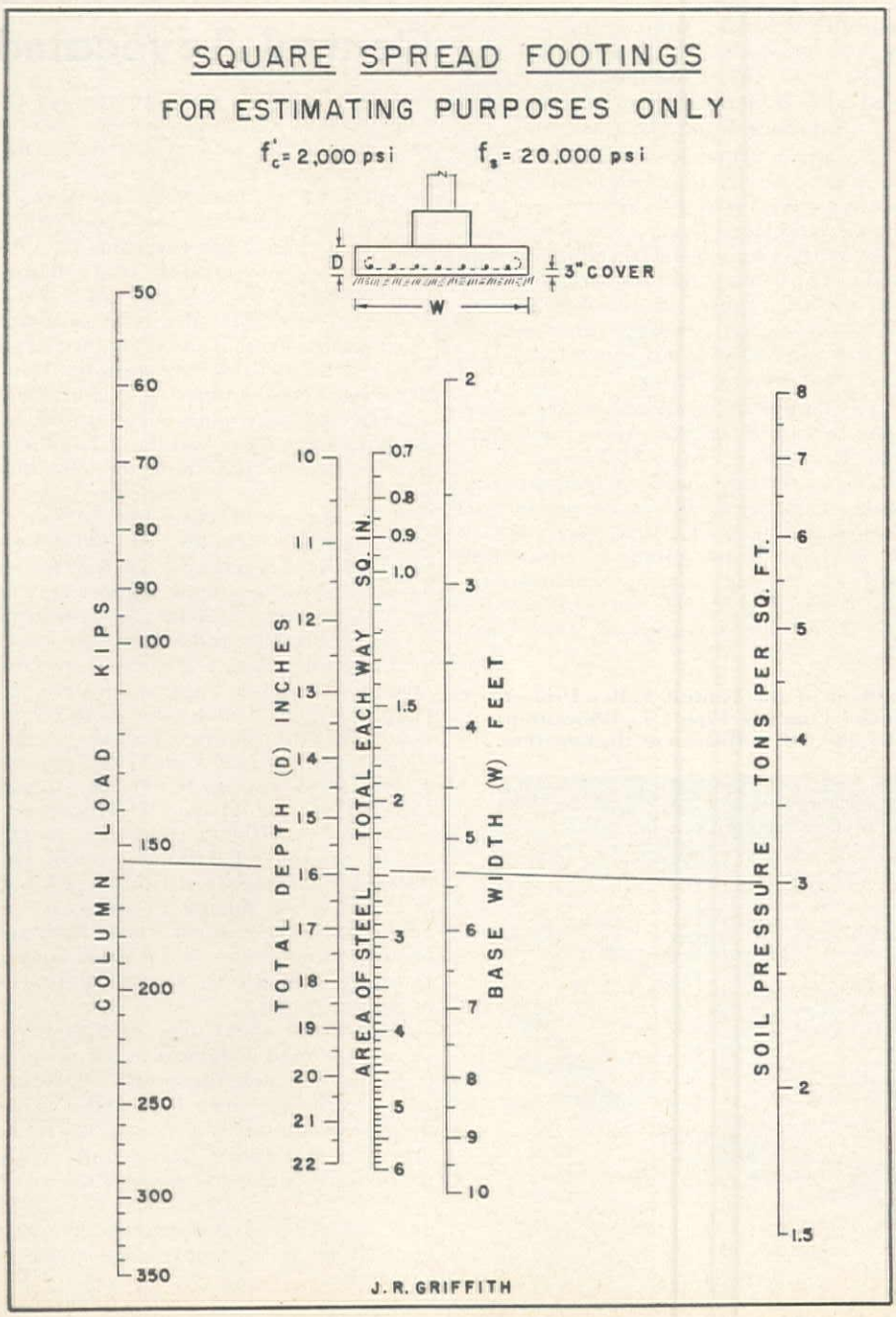
$p = 0.00285$
$f_s = 20{,}000$ p.s.i.
$f_c = 450$ p.s.i.

Then

$A_s = p\,b\,d = 0.00285 \times 63 \times 12.69 = 2.28$ sq. in.

If the choice is to be ⅝-in. round reinforcing bars, we would then be required to use 8 bars each way having an $A_s = 2.45$ sq. in. Note the fact that this choice would also satisfy the conditions as found from the accompanying chart.

Due to lack of space, it has been necessary in the above computations to assume that the reader is familiar with footing design and to omit many of the detailed steps.



NEWS OF WESTERN CONSTRUCTION

NOVEMBER, 1947

Construction Begins on Huge Central Valley Pump Plant

CONTRACTORS have commenced actual construction of the Tracy Pumping Plant, second largest in the world and "heart beat" of the Central Valley Project.

A group of California contractors, with offices in Oakland, who last June were awarded the big contract, have 960 days to complete the job, which includes also the building of concrete discharge lines and a 2½-mi. intake canal. The contract award was for $5,888,695, and the companies are: Stolte, Inc.; United Concrete Pipe Corp.; Duncanson-Harrelson Co.; and Ralph A. Bell.

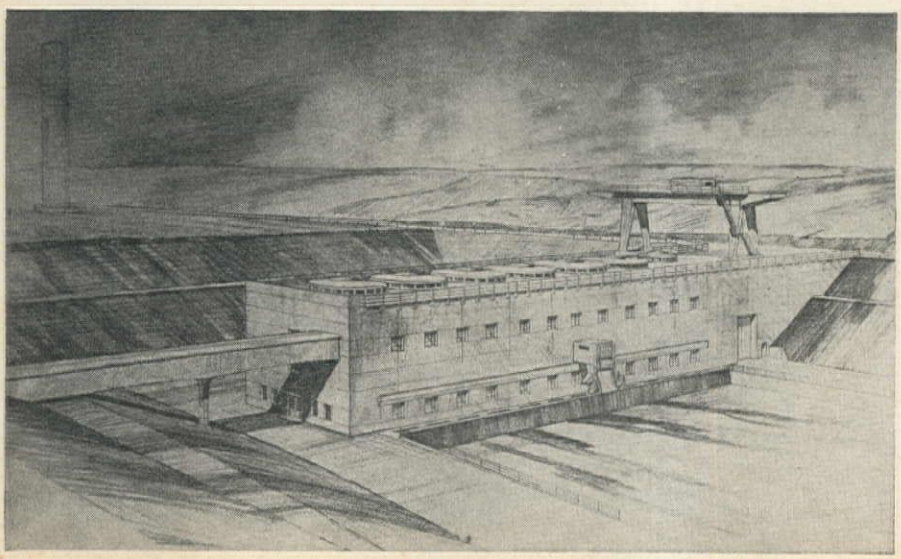
Tracy Pumping Plant, located in Alameda County, 8 mi. from Tracy, is one of the most important units of the entire Central Valley Project. By taking surplus water from the Shasta-regulated Sacramento River and pumping it into the 120-mi. long Delta-Mendota Canal, the plant carries out one of the essential functions of CVP—that is to carry an added supply to the water-deficient areas of the northern San Joaquin Valley. The new supply goes to San Joaquin Valley's west side farms to compensate for the San Joaquin River water taken from Friant Reservoir to serve lands in Madera, Fresno, Tulare and Kern counties along the East Side.

The plant, required to lift 4,600 cu. ft. of water per sec. to a height of 200 ft., is among the most powerful ever planned by engineers, being exceeded in size only by the Grand Coulee Dam pumping plant. The electric motors for the Tracy pumps will require about one-third of the hydroelectric energy generated at Shasta and Keswick power plants on the upper Sacramento River.

The pumps themselves now are under construction by the Worthington Pump and Machinery Corp., Harrison, N. J. Each is a vertical-shaft centrifugal pump with a capacity of 767 cu. ft. per sec. at a pumping head of 197 ft. and a speed of 187 rpm. Eash pump is connected with a vertical-shaft, synchronous motor rated at 22,500 hp. The motors are under construction by the Allis-Chalmers Co., Milwaukee.

The Tracy Pumping Plant will be built under the supervision of G. C. Imrie, resident engineer at Tracy.

ARCHITECT'S SKETCH of the Tracy Power Plant of the Central Valley Project, recently put under contract to Stolte, Inc., United Concrete Pipe Co., Duncanson-Harrelson Co., and Ralph A. Bell, on the bid of $5,888,695 to Bureau of Reclamation.



South Platte Flood Control Advocated

A PROGRAM of flood control on the South Platte River in Colorado has been proposed by the Denver District, Corps of Engineers. Their report of recommendations includes plans for a reservoir at the Chatfield Dam site south of Denver for flood and silt control, and a continuous levee system and channel improvement for the South Platte River from the reservoir site to Denver and downstream from Denver to St. Vrain Creek. Channel improvement on Boulder Creek, incorporated with a highway arterial parkway plan is proposed for Boulder and a levee system and appurtenant works on Coal Creek are scheduled for Erie.

A breakdown on costs for the recommended work includes: $14,408,000 for the Chatfield reservoir; $12,807,000 for agricultural levees from Plum Creek to St. Vrain Creek; $726,000 for municipal levees at Boulder and $32,450 for levees at Erie. These costs are based on construction prices in 1940, so cost for the project would probably be 70 to 80 per cent above the figures quoted.

Drainage area at Chatfield reservoir covers 2,988 sq. mi., while the storage capacity of the proposed structure is estimated at 200,000 ac. ft., with 180,000 ac. ft. provided for flood control and 20,000 for silt retention. Complete filling of the reservoir during an unusually severe flood in the South Platte drainage basin would inundate 4,600 ac. of land in retarding the water, according to the engineers' report.

Records of the Corps of Engineers show that flood waters of major proportions have struck the South Platte almost every year since 1844, and it is not unknown for several floods to strike during a single year. Disastrous floods, particularly along portions of the river, occurred in 1876, 1894, 1921, 1935, 1938, and 1942. Flood waters usually arise from April until August, according to the records.

Areas which have suffered most se-

verely in the past include Denver, Englewood, Boulder, and Erie, while thousands of acres of rich bottom land have been inundated and silted. The report pointed out that the most likely threat to Denver are flash floods that would damage large sections of the industrial area, railroad shops and yards, the stockyards, wholesale and some residential sections.

Besides the danger to communities, it is estimated that one-half million agricultural acres are in the path of any large flood. An additional 160,000 fertile acres are subject to damage through the potential destruction of headgate and canal systems adjacent to the river.

Local interests would be required to furnish without cost to the United States all lands, easements and rights-of-way necessary for construction of levees and channel improvement work and assurance of their willingness and ability to pay the costs of nonflood control features. Returns from the government leases on land under its control would be divided between the federal government and the state, with the state receiving 25 per cent of the income.

The proposed flood control projects are in addition to the $18,500,000 Cherry Creek control project now under way southeast of Denver. The Cherry Creek project provides flood safeguards for only one of the two streams which converge in Denver, and danger from the South Platte is equally menacing at flood stage, it was pointed out by Col. Craig Smyser, district engineer for the Corps of Engineers. A continuing contract for completion of the Cherry Creek dam by fall of 1949 will be let soon.

Trend of Gain in New Construction Continues

NEW CONSTRUCTION put in place during September, 1947, was $1,262 million, a more than seasonal gain of 2 per cent over the revised August figure and a gain of 18 per cent over September, 1946, the Construction Division, Department of Commerce, has announced.

Total new construction during the first 9 months of 1947 amounted to $9,022 million, a gain of 30 per cent over the corresponding period of last year.

New private construction in September, valued at $950 million, was 2 per cent above the revised estimate of $935 million for August. Of this total, private residential construction (exclusive of farm) was $475 million, 3 per cent above August. September private nonresidential construction was $276 million, also a gain of 3 per cent over August.

Privately financed public utility construction in September totaled $134 million, a gain of 1 per cent over the August figure. New public construction in September, estimated at $312 million, was 3 per cent above the August figure.

Public highway construction in September totaled $140 million, a contraseasonal gain of 4 per cent over August. New conservation and development construction in September was $42 million, the same as in August.

Water Conference Urges Congress To Establish Research Commission

HIGHLIGHTS of the recent National Water Conservation Conference held in Kansas City, Mo., were the decision to organize as a permanent organization and the passing of urgent resolutions directed to Congress for consideration.

The resolutions passed were to urge Congress:

(a) to establish a commission for the purpose of studying and making adequate research with respect to the matters hereinafter set out;

(b) to authorize such commission to employ a staff, who by training and experience shall conduct necessary research, such staff to be supplemented by outstanding expert consultants in the field of water use and related land problems;

(c) to instruct the commission to confer with official Federal and State agencies and with other organizations, including engineering and industrial societies, interested in land and water use and control;

(d) to authorize and appropriate sufficient moneys to conduct the work of the commission in a proper manner;

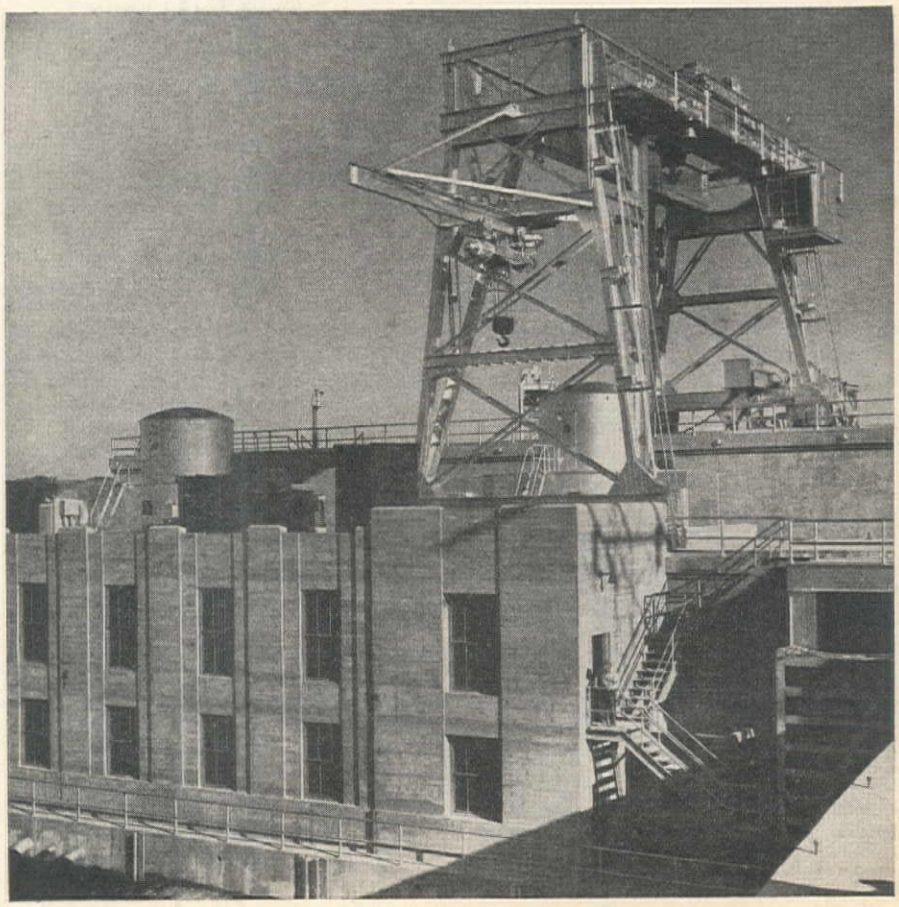
(e) and to instruct the commission on the basis of the study and research thus conducted, to recommend to the Congress policies and legislation for the future development, conservation and utilization of the land and water resources of the nation.

Other resolutions were adopted relating to inter-agency commissions, consumptive use of water, regional authorities, excess land limitation provisions of the Federal Reclamation Law, water service contracts, conformity with state laws, local control of water, the Tidelands decision of the Supreme Court, War Department contracts with local state agencies, reimbursement of taxes to states, Federal pollution control legislation, and non-navigation purposes of development by the Corps of Engineers.

The Conference also adopted a constitution under which it will operate. Hon. Alban J. Parker of Springfield, Vt., was elected president, and James H. Allen was named secretary-treasurer.

IDAHO POWER CO. ENERGIZES HYDRO PLANT IN EXPANSION PROGRAM

UPPER SALMON hydroelectric plant of the Idaho Power Co., near Hagerman, Ida., was put into service on Sept. 26, at special ceremonies. The plant is the first unit of the company's $50,000,000 expansion program calling for a total of five new plants with total energy production of 185,000 kw. Capacity of the Upper Salmon plant is for 16,500 kw. Construction of the plant was discussed in WCN for May, 1946.



Union Question of Thirty Hour Week Statute Rejected in Palfreyman Case

THE INDUSTRIAL Commission of Utah recently received a letter from Operating Engineers, Local Union No. 3, Salt Lake City, calling the Commission's attention to Utah Statutes, Title 49-11, Section 8, and pointing out the violation of said statute by the Palfreyman Construction Co. The question raised by the Operating Engineers was whether the Industrial Commission should call for a strict observance of Title 49-11, especially as it relates to thirty hours per employee per week as expressed in Section 8.

The letter further stated, by way of conclusion, "In view of the stated policy of the Commission that the labor laws of the State of Utah are administered fairly and alike towards all concerned, we feel that the above facts and circumstances should be brought to your attention, in order that your Commission take whatever appropriate action it deems necessary and essential for the administration of said laws."

A week after the Commission's receipt of the letter, a hearing was held with attendance by representatives of the State Road Commission, the Palfreyman Construction Co., and of the Operating Engineers Local Union No. 3. Facts developed at the hearing appear to be as follows: that the Palfreyman Co., since March 1, 1947, has been engaged in roadway construction between Henefer and Salt Lake City with time being the essence; that this construction work exceeded thirty hours per week for the employed men; and that the contractors in the state engaged in building construction have been operating in excess of thirty hours per week in general over the past several years for various reasons of urgency.

Excerpts from a published report of the opinion of E. M. Royle, chairman of the Industrial Commission, concerning the thirty-hour law case indicate clearly that no change in the Commission's policy will result from the Union's action, that the Commission considered the question untimely under present conditions of employment, and that Section 8 was inapplicable on the grounds of emergency requirements of construction alone.

It was pointed out that the rule of thirty hours per week may properly come up for examinaton only upon conditions approximating those prevailing in 1933, that is, when it appears desirable to spread available public work among unemployed citizens. It was further suggested that if the thirty hour week were a rule today, the earning of every person engaged on a public project would suffer a cut of from 25 to 50 per cent, and that the immediate reduced standard of living could hardly be construed as advantageous to working-men.

The following statement by Royle serves as a summation of the attitude of the Industrial Commission toward the question. "From no point of view, according to information available to us, does it seem appropriate at this time to change the hours of labor on public works. It appears to us that good law is the essence of good sense. The application of law is intended to promote the general welfare of those who it is designed to benefit. It would be folly to invoke a statute intended to spread the available work to more persons when there is a shortage of or limited manpower to fill present requirements. Until such time as it appears to us there is definite need for spreading the work as provided by the 1933 Statute, the Commission will pursue the course it has followed the past several years. When the time is appropriate, we shall not hesitate to enforce what might be characterized the 'worthy objectives' of Title 49-11, especially as it relates to spreading available work to citizens in need."

CAA Western Airport Program

(Continued from page 96)

Loc. and Name of Airport	Class Pres.	Class Prop.	Funds Sponsor	Funds Federal	Total	Proposed Work
Kirkland	0	1	34,690	30,700	65,390	Clear, grade, drain, level and seed runways, Adm. bldg.
Long Beach	0	1	14,840	16,000	30,840	Grade, seed, drain, Adm. bldg.
Skykomish	0	1	35,050	35,000	70,050	Land, constr. land. strip, parking apron.
Lake Wenatchee	0	2	35,050	35,000	70,050	Land, constr. land. strip, parking apron.
Okanogan	1	1	6,490	7,000	13,490	Ext. to present landing strip.
Wenatchee, Pangborn Fld.	3	3	28,845	31,100	59,945	Entrance road, grade, drain and pave apron.
Clarkston, Asotin Co.	2	2	35,410	36,500	71,910	Grade, pave runways and taxiway, Adm. bldg.
Prosser	3	3	7,700	8,300	16,000	Clear, regrade, drain, gravel runway and taxiway.
Colville Mun.	1	2	9,645	10,400	20,045	Grade taxiways, pave runways, taxiways and aprons.
Port Townsend	0	3	12,000	4,000	16,000	Acquire land.
Renton Mun.	4	4	13,910	15,000	28,910	Grade seaplane bldg. area, taxiway and apron paving.
WYOMING						
Rawlings Mun.	2	3	66,044	84,356	150,400	Land, Adm. bldg., landing area.
Greybull Mun.	2	3	38,915	52,585	91,500	Land. area.
Mondell Mun	1	1	30,111	40,689	70,800	Adm. bldg., landing area.
Cody Mun.	2	3	44,521	55,579	100,100	Runway, grade, drain, apron paving.
Worland Mun.	3	3	8,340	10,400	18,740	Land, grade, drain, fence, apron paving, bldgs.
Kemmerer Mun.	3	3	3,977	5,373	9,350	Pave warm up pads & aprons, Adm. bldg.
Upton Mun.	0	1	6,978	9,047	16,025	Land, grade and drain 2 strips and apron.
Sheridan Co.	4	4	5,614	7,586	13,200	Construct apron.
ALASKA						
Seward	1	2	10,000	30,000	40,000	Land, grading, drainage, stabilization.
Dillingham	0	2	13,300	40,000	53,300	Clear, grade, drain.
Seldovia	0	1	17,300	48,700	66,000	Grade, drain, gravel surface, zone clearance.
Palmer	0	2	27,375	60,125	87,500	Clear, grade, drain and gravel base.
Anchorage Mun.	0	3	126,333	275,000	401,333	Land, develop Class III Airport.
Fairbanks Mun.	0	3	50,000	86,000	136,000	Land, develop Class III Airport.
HAWAII						
Hana	0	3	128,250	128,250	256,500	Grade, pave, bldgs.
Kailua	0	3	100,000	96,000	196,000	Grade, pave, acquire land.
Kalaupapa	1	2	50,000	50,000	100,000	Grade, pave and fence.
Lanai	3	3	50,000	50,000	100,000	Pave runway.
Lihue	0	3	149,000	89,000	238,000	Grade, pave, fence.

FPC Approves New Plans For Oregon Power Plant

THE FEDERAL Power Commission has authorized amendment of a license issued Jan. 30, 1947, to The California Oregon Power Co. to provide for changes in the plans for a hydroelectric project located above Toketee Falls in the North Umpqua River in Douglas County, Oregon.

The project as originally planned was to consist of a diversion dam about 45 ft. high and with an over-all length of about 588 ft., located above Toketee Falls, a conduit leading from the dam to the powerhouse and a powerhouse located below the falls and containing two turbines each of 18,000-hp. capacity, two generators with 12,500-kw. capacity each, an outdoor substation and a transmission line.

As amended, the project will consist principally of a diversion dam about 75 ft. high and 825 ft. long, conduits, and a powerhouse with installed capacity of 55,800 hp. in three units operating under a static head of 471 ft., an outdoor substation, and transmission facilities. The crest of the dam will be at elev. 2,439, and the normal headwater at elev. 2,429. Initially the dam crest will be constructed to elev. 2,420 and the normal headwater elevation will be 2,410. The initial installation in the powerhouse will consist of two 18,600-hp. turbine units operating under a static head of 452 ft. and two 14,167-kw. generating units.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—It must be apparent that we are rapidly moving into another version of controlled economy. At this writing it seems likely that the first phase will be a system of allocations of materials and products and, possibly, even manpower. This would not make the controls onerous to the consumers, who, obviously, are the main body of the voting populace.

It is logical that in a period as important as the quadrennial election-year, when a President is to be chosen, the burden of restraint will be made to rest as lightly as possible upon those who cast the ballots. But whether or not it will be possible even for the combined eagerness of the Executive and the Congress to avoid the imposition of restrictive measures (as both the foreign and the domestic situation tightens) with the development of the many influences which are increasingly conditioning our national life, is considered very doubtful in many quarters. This view is held particularly among the people who are devoted to the solution of the problems of national defense.

State of emergency?

In some of the important quarters here in the Capitol there is a consistent and persistent belief that the impending special session of Congress, and the foreign situation, plus what it will do to the domestic life of the country, will result sooner or later in the conviction that we must go into what is called a State of Emergency.

You will have noticed that the suggestions which for the months past have been aired in these Letters that we were bound to have a Special Session have eventuated virtually as forecast. Even during the closing days of the last regular session, the Members of Congress who were close to the White House told us with assurance that the Special Session would be called circa November 15.

As the President told the correspondents when he announced the Special Session, the date would fall by the time when all the peripatetic committees and groups of Congress, in Europe and elsewhere, had landed back in the United States with their reports. In addition to the personal, first-hand information brought back by the members of Congress, the President had fortified himself with reports from the primary Departments of the Government upon the State of the Union, which were delivered to him on October 17. It is obvious that the effect of the prices, and runaway market, upon the life of the nation, plus the burgeoning news of what is happening in Europe and Asia, made these reports ominous.

The Department of National Defense apparently took a gloomy view of the prospects. They—Army, Navy, and Air Forces—naturally are more sensitive to the forces at large in the world than are most other Departments, because it will be their job to defend the Nation in case of any explosion. It is understood they stressed the unpreparedness of the industries upon which the National Defense must lean, and they suggested it would take at least 90 days to reach even some vestige of the necessary stance. If the National Defense people are not over-pessimistic it seems probable that we have allowed many of our major industries used in the last war to slack down into something approaching defense disintegration. Apparently we need stockpile operations, re-equipment of many plants, re-vitalization of our transport systems, and re-assembly of the essential work forces.

The National Defense people naturally see the darkest side of the picture; but, allowing for their tendency to see the worst, it is valuable to understand why they feel as they do. Apparently they think we have allowed our vast aircraft industry to decay to an almost negligible equation, so far as defense purposes are concerned. They think at least the five most important aircraft plants of the nation should be kept to comparative military efficiency by the expenditure of, say $6,000,000 per plant, or $30,000,000 per year, over-all. It is pointed out it takes three to five years to gear up the industries of the nation to the production, as well as assembly, of strategic material.

Decentralizing industry

There seems to have been little or no progress accomplished in convincing the units of the national economy that the fundamental industries should spread, and go underground. Our military friends here, in informal conversation, point out that if war comes the enemy undoubtedly would be just as aware as we are that the overwhelming bulk of our primary production lies East of the Mississippi, between the great river and the Allegheny Mountains.

And it is just common sense that any enemy, under present conditions, would first aim at destroying this chain of industries and thus cripple our military effort to an incalculable degree. They tell you here that possibly an enemy could secure such a devastating result with both atom bombs and biological bombs at the expense of 25 to 30 aircraft with their destructive burdens and crews.

By way of contrast, to show how other nations confront the same problem, we are told that, for instance, our Russian friends have dissociated their major war-supporting industrial units in four geographically separate groups. Each area supports the other, but each group area also can operate independently of the others, and would be able to carry on in support of the armed services without any material dimunition of the war effort. Moreover, while those in operation continue to function, the areas which have been damaged or destroyed could be restored.

Irresistible pressures

In the light of this information, together with pressures that are growing more acute from many sources, it is possible to understand why business men from your heavy construction industries, and from other industries of the West slope, who have recently visited Washington, have taken away an impression something like this: emotionally as well as intellectually, they have become aware that the conferences and the meetings and the various discussions either in the open or behind closed doors, on the record or off, here and in other parts of the world, as well as the elections and political movements overseas, have set in motion currents and influences and pressures which have some of the cosmic force of the earthquake.

We know an earthquake happens after the pressures become so irresistible that something inside the Earth must move. The politics of the world have apparently just about reached a similar state, as our people with an international consciousness perceive the situation. This does not necessarily mean an immediate war, but it does mean turmoil, uncertainty, confusion, shocks, and great danger to the structure of civilization.

People here see it this way, to be more specific: like France, various countries of Europe and Asia are entering a phase of stress and strain which will rapidly crystallize in decisions and actions. We watch France, because to some extent it is the pivot upon which the European movement depends.

It is more and more apparent that these Europeans are not glowingly enthusiastic about us. Even when they lean towards Democracy, their interpretation of Democracy is not what we regard as Democracy. The feeling is that however they may go they will not swing toward us. They like us chiefly when they see the money-spigot wide open.

The Scandinavians are classified as champions of Democracy, but they think our Democracy is too far towards the right of Capitalism. We have warm and earnest friends in England, but the United Kingdom has been told in the event of a war its defense machinery could not help them to survive a day.

It is clearly plain that our friends along the Mediterranean love our handouts even better than they love us. Europe always has been extremely realistic; and you cannot blame them for taking thought for their own interests. This has always been the story of our relations with Europe.

The approaching climax

All these many complicated pressures, seen and unseen, are expected to produce a climax during November. There

are some people who even have predicted the crisis somewhere around the end of October, and that it will continue at high tension until the first week of December. This anticipation undoubtedly has had an influence upon the issuance of the call for the Special Session.

Do not misunderstand: the crisis is not expected to eventuate into an immediate war, but it is feared that a tension of this kind, with the absolutely unpredictable effects of its psychological factors, may cause explosions of tempers which can produce incidents that might throw the world into flame. It is this situation which may develop into the condition that may make a State of Emergency appear to be a solution for the insecurity and for the urgent need for some decisive action.

What is a State of Emergency? By and large, it will enable the Government to implement its machinery with controls that will check the present inflation, and will swiftly bring about a greater state of preparedness. In essence it would give us a form of benevolent dictatorship for the duration of the Emergency. Probably, it would mean, in effect, if not in appearance, a planned economy under military direction, with a temporarily regimented society.

Few Americans want a totalitarian planned economy. We know that any controls here arouse apprehension. There is no remote doubt the President would strenuously oppose any system involving over-all controls. He knows that the people are becoming painfully aware that the Bureaus and the Departments never give up any powers they have grabbed. Each of the steps they take—steps in consolidation of authority and power—makes the Departments and Agencies more solid as the parts of the Government which interpret the laws, and makes the policies behind the laws.

Congress needs support

The concentration of power in Washington which already exists has made the functions of Congress more limited and more difficult. The confusion, and the bewilderment out among the people of the grassroots—including the business community—make it much more difficult for Congress to get the support of the people in the actions which Congress feels it must take to protect their interests. And it is the place here to stress emphatically that speaking in the broadest sense the Members of Congress are every whit as patriotic as you are, and are every bit as intelligent as you are, and want what you want, if they only can sense decisively what it is you want.

Congress is confronted with a tremendous problem. The forces which sincerely and consistently believe in concentration of powers of control with the prospect of war, logically hold that the next war will be such an absolute effort at annihilation that it will be necessary to bring every tiny bit of the nation within the organized pattern of offense and defense. They frankly feel it will be unwise to weaken the whole, by establishment of such civilian units as we had in the last War,—organizations such as the War Production Board, the Office of Price Administration, the Office of Defense Transportation, and similar war bodies which were directed and manned by civilians as civilian institutions, partly as an offset to the power of the military.

The people of the Armed Services honestly and with utterly sincere conviction believe that our safety and our chance for victory, in the event of war, could be assured only by bringing everything under total control of the National Defense Agency. Bear in mind, the Army, the Navy, the Air Forces, and the National Defense agency, regard any coming war as such a total war that the need for complete inclusion of every human activity makes it necessary that those charged with the National Defense must not be hampered by areas where they cannot use the national resources, literally and dynamically.

Workers under military control

It is emphatically not an alarmist philosophy, or propaganda, in the opinion of a large part of official Washington, to discuss freely, and with candor, these factors which increasingly loom in our life. The striking development of the organization of the Organized Reserve Corps, also known as the Industry Reserve Corps, is a case in point. In effect it is an auxiliary military organization, which places the workers under military control. It was created by the National Defense Department, but is announced as entirely a volunteer organization. The member of the Reserve is not attached to the regular Army, nor to the National Guard. He can be called into active duty only by the President.

The exact definition of the organization is yet vague. It appears to be a vastly expanded version of the Sea Bees. In some quarters it has been announced that, in the beginning, only former Service Men will be eligible. Each unit of the Reserve stems from the sponsorship of some specific business organization. As jointly announced by the Department of the Army and the Associated General Contractors, the construction industry Reserve Corps has been sponsored to the extent of 100 units by the A. G. C., and will be affiliated with the Corps of Engineers. The 100 units will consist of 45,000 officers and men. They will be known as Construction Battalions; Aviation Engineer Battalions; Headquarters and Headquarters Companies of Engineer Construction Groups; Headquarters and Headquarters Companies of Aviation Engineers Groups; and Headquarters and Headquarters Companies of Engineer Port Construction and Repair Groups. The Army announced that the A. G. C. would draw upon its 4,300 construction firm members, and its more than 100 chapters and branches, for support. Chief of Engineers, Lieut. Gen. R. A. Wheeler, made a public statement in which he asserted the 100 construction units would form the backbone of the engineer program of preparedness.

The authority for the establishment of this auxiliary service is not clear from announcements. The question will undoubtedly be raised by Members of Congress at the instigation of Labor Unions.

Role of the new Reserve

It has been stated the Organized Reserve Corpsman can be called into active duty only by the President, after Congress has declared a State of Emergency. Actually, the presumption is that each Reserve unit will stem from some specific working group in some specific plant or corporate or other industrial firm. Each military workers' unit is maintained on an inactive status with cadre or key personnel supplied from the ranks of officials and employees of the sponsoring firm. There are three classes—A, B, and C.

Class A will consist of units with full complements of officers and enlisted men. In an Emergency they will be ready for assigned missions after a short additional training. Class B units will have a full complement of officers and a cadre of key enlisted men, which on mobilization will be brought to full strength through the selective service system. Class C units, comprising the balance of technical or specialized type units, will consist of a full complement of officers only.

The Class C units, with 60% minimum of authorized officer strength, will be the initial undertaking in the construction group. These will be expanded into the Class B units, with 80% authorized officer strength and a cadre of enlisted men; the next step will be expansion into Class A units, with a minimum of 80% officer strength and 40% enlisted men. Each group will get training of one drill period per month. It also is intended they shall have two weeks summer field training. Those who wish to enlist are expected to voluntarily apply in writing. The Commanding Officer of a group is chosen from the eligible Reserve Officers on agreement between the sponsoring business house or plant and the National Defense Department.

Those who become members of the Reserve at present are given the same rank as they held when they were honorably discharged from the Army. They can attain higher rank by special work and additional training. Basic units usually consist of 13 to 15 men. Those who wish more detailed information are advised by the Government to apply: Sixth Army Area—Col. S. Gordon Hyde, Sixth Army Headquarters, Presidio of San Francisco, Calif.; Fifth Army Area—Lt. Col. Ralph L. Guzelman, Quartermaster Section, Fifth Army Headquarters, Room 309, 1660 North Hyde Park Boulevard, Chicago 15, Ill.; Fourth Army Area—Lt. Col. Benjamin E. Edwards, Jr., ORC Section, G-3, Fourth Army Headquarters, Fort Sam Houston, Tex.

The Organized Reserve Corps also will be maintained by the Corps of Engineers for industrial units in utilities, forestry, lumber, trucking, equipment and allied industries. It will have fire-fighting platoons of 41 and 27 men each; maintenance and camouflage battalions; petroleum distribution units; light and heavy dredge units; ship and dump

truck companies; map-making and map-reproduction units; foundry, gas-generating, and power-line and carbon-dioxide detachments.

Straus vs. Congress

We hear politics will determine the fight between recalcitrant Mike Straus and various Members of Congress, rather than an effort to determine whether there has been an open violation of law and order. The word is that Mike will get the money for Central Valley; Columbia River Basin; Boise-Anderson, and Colorado-Big Thompson, because the votes in those areas may mean the difference between success and failure for Truman at the polls. Davis Dam also is slated for generosity, but it has less relationship to Reclamation.

It was rather disheartening the other day at a conference in Sen. Ken Wherry's office to watch the slippery gyrations of this usually aggressive Senate whip in the effort to avoid making a flat charge of contumacy and violation of the law against Mike. Wherry was mad, and Wherry wanted to have the world know that Mike was implying the possession of money for Reclamation that did not square with the facts. He harped on the gap of $36,000,000 which he said Mike did not have; and he prepared a six page document to show how wrong Mike is in his mathematics; but he would not say that Mike is a bad boy who is disobeying his employers, the Congress. Wherry wanted us, the reporters to say it—but not to put Wherry on the spot by saying it in his name.

Sen. Bridges was more direct and courageous. He pointed out that Mike is strictly within the law, but that he uses his public relations section to give the impression that he is violating the law by spending more than he has to spend, which is literally untrue, but which creates a pressure on Congress that will gain for Mike and his Bureau the funds he says he is spending.

Straus vs. Budget Bureau

Mike also fell afoul of the Budget Bureau. They wrote a letter stating that what Mike has been ballyhooing would be a violation of the Anti-Deficiency Act; and that any supplemental appropriations, such as Mike has been working for, must be channelled through the Budget Bureau, and that the Budget Bureau has seen no justification for the desired appropriation.

"Tex" Goldschmidt, Congressman Rayburn's good friend, the top public-power champion in Interior, now is Executive Vice-Chairman of the Interdepartmental Technical Committee which is digging up the aid the Europeans need, with the resources that might be marshalled by Interior. Walter Seymour, who comes from TVA, is the new head of the Power Division, as well as of the Program Division of Interior. If Congress wipes out the Power Division, Seymour would be able to continue the power marketing activities through the Program Division. It will, incidentally, be the Goldschmidt job to find a way to send equipment to Europe to enable that continent to increase its electrical production by 25,000,000 kilowatts, under the Marshall Plan.

Miscellaneous

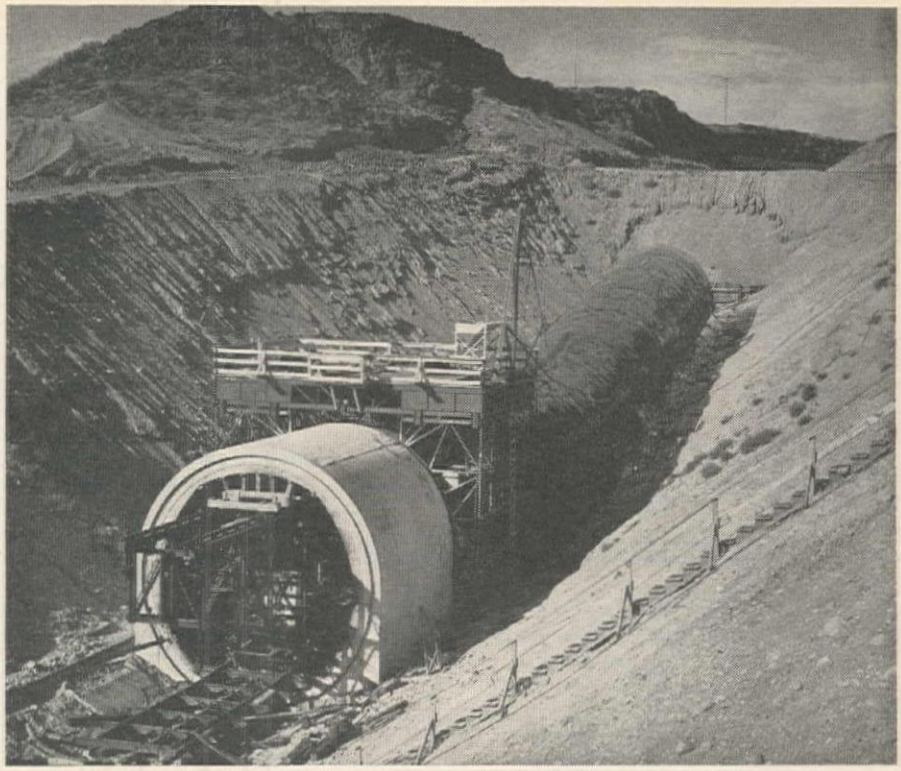
The Head of FWA recently made the statement that total public construction this year will aggregate $2,900,000,000; $1,700,000,000 comes from states and local communities. In addition, the backlog reported by FWA totals $2,300,000,000. FWA also is urging support for a bill before Congress which would supply $100,000,000 to be lent to states, cities, and industrial units to spend upon stream pollution abatement.

Construction materials continue to be short, and are failing in supply, according to Department of Commerce—Steel and lumber also are reported lacking. Shortage of nails is the item most frequently reported.

Over $932,000,000 in contracts were awarded for Federal Aid highway projects during the period between Jan. 1, 1946, and Sept. 1, 1947.

The Committee of Congressional Apportionments of the House recently drew attention to the fact that if present population shifts continue until 1950, California would gain 6 more Congressmen, and Washington and Oregon would each add one Member.

Several hundred more engineers and technological aides are sought by the Bureau of Reclamation for employment in the Missouri River Basin where 10 new dams are to be constructed, and to be employed in the field offices which must be more actively staffed.



FIRST CONCRETE POURED ON GIANT COLUMBIA BASIN SIPHON

THE FIRST barrel section of the Dry Coulee Siphon No. 1 of the 88-mi. West Canal of the Bureau of Reclamation's Columbia Basin Irrigation Project was poured in the early fall by Winston Bros.-Utah Construction Co., contractors, who together hold the $2,871,796 contract for building the first 6½ mi. of the West Canal. The siphon is located near Soap Lake, Wash., and is 4,400 ft. long and 25 ft. in diameter.

Progress Slows on Columbia Project

PROGRESS ON SOME structures of the irrigation works for the Columbia Basin project is being slowed down. R. B. Williams, assistant district manager of the project, in a speech delivered in Spokane the middle of September, stated that the slowdown was being made by the contractors to enable the Bureau of Reclamation to meet progress payments during coming months. Obligations of the project amount to about $36,600,000 for the present fiscal year, but available funds, including carryover, amount to about $21,600,000. A deficiency appropriation will be sought from Congress at the next session.

All construction work has been halted on the main pumping plant at Grand Coulee dam, and on the feeder canal extending from the pumping plant outlet to the future reservoir in upper Grand Coulee. Stoppage is attributed to restrictions placed on force account work by provisions in the last appropriation bills. Progress on contract work is noted as follows:

South dam — Bair and Crick have made good progress to date, but curtailment of construction will be necessary.

Main canal — Lining has been indefinitely postponed by J. A. Terteling.

Bacon Siphon and tunnel—T. E. Connelly has halted all work on the siphon,

and has withdrawn crews from the outlet portal operations at the tunnel. Full heading is being driven from the intake portal.

Long Lake dam — Work on the dam will cease shortly and J. A. Terteling will emphasize work on excavation of the main canal.

West canal — Utah-Winston have ceased work on the west canal, and are concentrating forces on the east low canal.

Potholes dam — Lytle-Green-Amis have not appreciably curtailed work because of necessity for bringing embankments to the original ground line before winter.

Narrows Span Bids Exceed Estimates

BETHLEHEM PACIFIC Steel Corp. and John A. Roebling's Sons Co. submitted the low bids for the two construction schedules of the Tacoma Narrows bridge to the Washington State Toll Bridge Authority in Olympia, Wash., on Oct. 15. Bethlehem offered to construct the towers, roadway, anchorages, and approaches included in schedule No. 1 for $8,263,904 and Roebling's figure for the cables and cable appurtenances included in schedule No. 2 was $2,932,681.

Only one other bid was submitted, Columbia Steel Co. offering figures of $8,937,358 for schedule No. 1 and $4,661,503 for schedule No. 2 .The low bid was about 32 per cent above the engineers' estimates, and nearly double the $6,400,000 construction cost of the original structure in 1940, notwithstanding the fact that the piers of the first bridge will be used with some alterations.

Whether or not the bridge authority would go ahead and award contracts for construction of the bridge, or whether the bids would be rejected and plans revised to lower construction costs was not immediately announced in Olympia. A great deal depends upon terms which can be secured for the sale of bonds to finance the project, and it is possible that an attempt to sell revenue bonds will be made before a definite decision on award of the construction contracts is made.

Savage Unit Will Have Water Works

CONSTRUCTION of the water supply works for the Savage Pumping Unit in Richland County, Mont., has been authorized by the Bureau of Reclamation.

Savage Unit is one of the 26 pumping units included in the Yellowstone River Pumping Project, a part of the resource development program authorized by Congress in the Missouri Basin Project. Landowners on the 2,200-ac. Savage Unit have completed the organization of an irrigation district and have indicated a desire to cooperate with the Bureau in working out the final form of a repayment contract.

For fiscal year 1948, the Bureau of Reclamation allocated $289,000 to initiate construction of the pumping plant, main canal and laterals and for the continuation of investigations on the drainage system for the Savage Unit.

The irrigable lands in the unit are included in farms with a combined area of 16,700 ac. The present use of the lands on the Savage Unit consists primarily of dry-land farming and grazing.

Plans for the development of the Savage Unit were retarded for a number of years by the lack of low-cost power for pumping. In 1945, the Bureau of Reclamation completed construction of a transmission line from Fort Peck to Glendive, making low-cost power available for pumping units and other purposes.

The Bureau of Reclamation's Fort Peck-Glendive and other lines not only will provide low-cost power for the Savage Unit but will serve other subunits of the Yellowstone River Pumping Unit as they reach the construction stage. During the current fiscal year the work program on the Yellowstone River Pumping Units will center primarily on the Sadie Flat, Sidney and Cartwright Units and will provide for preliminary investigations on the Marsh, Seven Sisters and Stipek Units.

Tacoma Flood Control Bid Opening Postponed

OPENING OF BIDS for an $800,000 railway bridge and levee project, a part of the flood control works along the Puyallup River near Tacoma, has been indefinitely postponed by Col. L. H. Hewitt, Seattle district engineer for the Corps of Engineers. In addition to the bridge construction the project calls for 4.4 mi. of levee and 2.2 mi. of channel rectification.

Plans Ready for First of Montana Irrigation Projects

MONTANA WATER Conservation Board is expected to call for bids shortly after Jan. 1, for the first postwar state project to be financed by a $4,500,000 fund set up by the last legislature. Plans and specifications for the $222,000 Hysham pumping project to irrigate about 7,500 ac. have been completed under the direction of Fred Buck, chief engineer for the board. The second project, which will also be started next year, will be the $330,000 Musselshell canal project to irrigate about 15,000 ac.

Portland SCS Offices Moved

OFFICES OF THE Soil Conservation Service, Pacific Coast region, in Portland, have been removed from the Pacific building downtown to the administration building at Swan Island, ship building center during the war.

PERSONALLY SPEAKING

Four representatives of the West were among the 31 leading American business men in the construction and allied fields appointed to guide the activities of the United States Chamber of Commerce Construction and Civic Development Department. These were: **W. R. Bimson**, president of the Valley National Bank, Phoenix, Ariz.; **Frederick P. Champ**, president of the Cache Valley Banking Co., Logan, Utah; **William A. Simpson**, president of the Wm. A. Simpson Co., Los Angeles, Calif.; and **John C. Stevens** of Stevens and Koon, Portland, Ore.

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Six Nevada state highway employees were recent recipients of awards marking at least a quarter of a century of work in the department. Having a total of 155 years of service to their credit were **George R. Egan** of Carson City, engineer of surveys and designs, who has served 25 years; **Julian A. Glock**, division engineer in charge of district 3 at Elko, 30 years; **John L. Hancock**, division engineer in charge of district 2 at Reno, 25 years; **Huston D. Mills**, assistant state highway engineer at Carson City, 25 years; **Willard R. Parry**, division engineer in charge of district 4 in East Ely, 25 years, and **Paul R. Rawls**, location engineer, Carson City, 25 years. Presentation of the awards was formally made last week at the AASHO convention in New York by **C .W. Phillips**, Tennessee state highway commissioner and president of AASHO.

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Milton J. Brock was re-elected president of the third annual Construction Industries and Home Show to be held at the Pan-Pacific Auditorium in Los Angeles, Calif., June 10 to 20, 1948. Brock, member of the Associated General Contractors, has been president of the Home Show since its inception in 1945 as a non-profit corporation owned and operated by the Los Angeles Chamber of Commerce and 14 major construction associations. **Earl S. Anderson**, former Chamber of Commerce construction industry executive who served as vice-president of the show during its first two years, has been chosen executive vice-president and permanent manager of the Home Show. Show headquarters have been established at Suite 713, the 9th and Hill Building, Los Angeles.

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Cleves H. Howell, project engineer, Colorado-Big Thompson Project, has retired at the age of 67. He was appointed project engineer in 1942, following service as senior engineer and Acting Supervising Engineer on the project. **Everett S. Huntington** of Denver has been named acting project engineer to succeed Howell. Hunt-

CROWELL GOEHRING JENSEN FORESTER HERDMAN

ington comes to the Colorado-Big Thompson from the Chief Engineer's Office, where he has been head of the Specification and Reports Section of the Dam Division since 1946.

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Dr. William F. Thompson, research professor and director of the fisheries research institute at the University of Washington, has been appointed consulting biologist for the design of fishways at McNary dam to be built on the Columbia River near Umatilla, Wash. Dr. Thompson, who was a director of the international Pacific salmon fisheries commission during the Fraser River fishway studies, is analyzing the efficiency of fish facilities at Bonneville Dam as a preliminary to making recommendations for McNary Dam to the Corps of Engineers, Portland district.

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Richard W. Williams, head of the supply division of the Portland district, Corps of Engineers, retired from active service last July after 47 yr., 9½ mo. of service in the Portland district. A native of Oregon City and a graduate of Willamette University, Williams joined the Portland district staff in 1899 as a survey party recorder. From that time until 1915 he worked largely on the Columbia River in connection with surveys or construction. In 1915 he was placed in charge of the Portland plant section, and for 4 yr. from 1923 was in charge of jetty construction at Reedsport, Ore. For the past 13 yr. he has been head of the supply division.

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P. E. Oxley, one time maintenance engineer for the Idaho Bureau of Highways, has been appointed construction engineer. He succeeds **C. C. Hallvik,** who recently resigned to join the staff of the Idaho district, Civil Aeronautics Authority, and who was serving as construction and materials engineer. Oxley has most recently been connected with Morrison-Knudsen Co. on the construction of the dam and power plant at Hagerman, Idaho, for the Idaho Power Co.

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Howard L. Brewton, formerly of Thomasville, Georgia, and recently a Naval civil engineer officer at several Pacific Northwest installations, has joined **Charles B. Wegman,** general contractor of Portland, in the formation of a new contracting firm in Portland. Wegman & Co., Inc., will succeed Wegman & Son. Brewton served during the war as assistant to the officer in charge of the navy base at Astoria, superintendent of construction for the Thirteenth Naval District at Seattle, and commanding officer of a Seabee battalion at Kodiak, Alaska.

The Bureau of Reclamation has announced the designation of construction engineers for five of its dams on the Missouri Basin Project. **Harold M. Crowell** will be construction engineer of Bixby Dam of the Moreau River Unit in north-central South Dakota. Crowell, formerly resident engineer on the Bureau's Central Valley Project in California, will maintain temporary headquarters at Faith, S. D. **Floyd M. Jensen,** former chief of surveys on the Boysen Unit, has been designated construction engineer of the Cannonball Dam, flood-control feature of the Cannonball River Unit to be located south of Elgin, N. D. **F. E. Goehring** has been named construction engineer for Keyhole Dam on the Belle Fourche River in northeastern Wyoming, with project headquarters maintained in Moorcroft. Goehring comes to Region 6 from the Deschutes Project in Oregon. **D. M. Forester,** formerly project engineer of the San Luis Valley Project in Colorado, has been designated as construction engineer for the Bureau's Shadehill Dam of the Grand River Unit in northern South Dakota. **Robert F. Herdman,** former production engineer with the Office of the Chief Engineer in Denver, Colo., has been designated construction engineer for the Yellowtail Dam and Powerplant of the Hardin Unit in southern Montana. Headquarters will be at Hardin.

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Carl A. Gustafson, supervisor of the Plumas National Forest at Quincy, Calif., has been promoted to assistant chief of fire control for the United States Forest Service and took up his new duties at Washington, D. C., Oct. 10. Regional Forester **P. A. Thompson,** in announcing the promotion, said Gustafson has wide experience in forestry and is an expert in forest fire control. Outstanding work as assistant supervisor in charge of fire control on the Klamath forest brought him to the regional office in San Francisco in 1935 as associate forester in the fire control division. In 1941 he became supervisor of the Klamath forest. In June, 1946, he was transferred to supervisorship of the Plumas, a forest with a heavy fire problem.

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R. H. Baldock, state highway engineer of Oregon, was elected president of the American Association of State Highway Officials at the annual meeting of the organization held in New York last month. Baldock, more familiarly known as Sam, has served Oregon as state highway engineer longer than any other state highway engineer of the eleven Western states has served his respective state in the corresponding position, and the Oregon highway department is well known as one of the most efficient and best operated in the West.

Sumner P. Wing has been appointed by the Bureau of Reclamation as special representative to cooperate with the State Department and serve as liaison officer with irrigation representatives of foreign nations. Wing succeeds **William E. Corfitzen,** who was recently named irrigation adviser to the American Mission for Aid to Greece. As special representative, Wing will participate for the Bureau in the program of the United States Interdepartmental Committee on Scientific and Cultural Cooperation. This involves work with international engineering congresses, exchanges of technical design data, in-service training of foreign engineers and similar activities.

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The names of the newly enlarged Calif. Board of Registration for Civil and Professional Engineers were announced recently by Governor Earl Warren. These are **P. E. Jeffers,** Los Angeles, president; **M. M. Falk,** San Francisco, and **A. G. Proctor,** Woodland, all representing civil engineers, and **L. M. K. Boelter,** Los Angeles, chemical, **William H. Geis,** Los Angeles, petroleum, **R. W. Sorenson,** Pasadena, electrical, and **G. L. Sullivan,** Santa Clara, for mechanical engineers.

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The designation of **Bruce Johnston** as district engineer and **W. Wendell Palmer** as district supervisor of operation and development for the Missouri-Souris district of Region 6, was announced recently. Johnson, also acting temporarily as district manager, has been employed in Bismarck, N. D., as an engineer for the Bureau of Reclamation since 1940. Palmer has been unit supervisor of the Bureau's Missouri-Souris Unit since May, 1947. Headquarters for the district will be at Bismarck.

* * *

G. H. Edwards has been appointed project engineer for the design of water supply and sewage disposal system extensions at Richland and North Richland, Wash. A contract for the work has been awarded to DeWitt C. Griffen and Associates, consulting engineers of Seattle, by General Electric Co., prime contractor under the Atomic Energy Commission. Edwards, who will supervise the work at Richland, was also in charge of the original work at the site in 1943.

* * *

William P. Price, Jr., recently appointed construction engineer for Canyon Ferry dam, has also been appointed as acting district manager for the upper Missouri district office of the Bureau of Reclamation, with headquarters at Great Falls, Mont. In the latter capacity he will have as assistants **Harold E. Aldrich,** acting assistant district

manager, **Charles T. Hinze,** district engineer, and **E. G. Ferguson,** district supervisor of operation and maintenance. Aldrich has been assistant executive officer of the Missouri Basin project activities in the Region 6 office of the Bureau of Reclamation at Billings, Mont. Ferguson has been county agent of Blaine County and manager of the Milk River Production Credit Association before being appointed unit supervisor at Havre, Mont., a year ago.

* * *

Don C. Davis, Director of Public Works and City Engineer at Turlock, Calif., for the past two years, took office Sept. 15 as the first administrative officer for the City of Monterey Park upon appointment by the City Council. He will act as liaison officer between the council and department heads, as city engineer, and will handle all purchasing and correspondence. Prior to his Turlock post, Davis was planning engineer for the City of Modesto.

* * *

James A. Davis, assistant director of state highways for Washington; **T. P. Doyle,** district engineer at Yakima; and **O. R. Dinsmore,** office engineer, were all awarded 25-yr. merit certificates at the annual meeting of the American Association of State Highway Officials held last month in New York. Davis and Doyle each have served the Washington highway department for 26 yr. and Dinsmore for 25.

* * *

C. Stribling Snodgrass, a director of Bechtel Corp., is now serving as vice-president in charge of engineering, according to a recent announcement made by **S. D. Bechtel,** president. He now has charge of all engineering and development activities, with emphasis on the design and engineering of refineries and chemical plants. Snodgrass continues as a vice-president and director for the corporation, and as a director of Bechtel International Corp., and will make his headquarters in San Francisco.

* * *

Charles T. Bragg, prominent Detroit engineer, has joined the staff of the Boise, Ida., Junior College as engineering instructor. A member of many professional engineering organizations and a major in the Army chemical warfare service during the war, Bragg has been associated with several large corporations, among them General Electric, Douglas Aircraft, Michigan Smelting and Refining Co., and Alloys Refining Corp.

* * *

W. P. Rowe, consulting engineer of long standing in San Bernardino, Calif., and **A. A. Webb** of the Riverside Water Co., Riverside, Calif., have become associated as Rowe & Webb Consulting Engineers at 2635 Main St., Riverside, specializing in water supply and general civil engineering. **J. A. Rowe, T. E. Rowe,** and **E. N. Webb,** sons of the principals, will be active in the business with them.

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Four engineering aides to serve in the city engineer's office have been appointed in Bremerton, Wash., under authority of a recent emergency ordinance. The new employees are **Wayne Lichter, Robert Wallace, Lowell F. Wiley,** and **William E. Nims.** The positions were created due to a number of construction jobs in progress this summer under supervision of the engineer's office.

ANTHONY P. DEAN

Anthony P. Dean, assistant regional forester in charge of engineering work for the California region, U. S. Forest Service, recently succeeded **Theodore W. Norcross** as chief of engineering for the Forest Service with headquarters in Washington, D. C. Norcross is retiring after 27 years as chief engineer, Regional Forester **P. A. Thompson** announced. Dean has been in charge of engineering on national forests in California since 1939. **James J. Byrne,** engineer for the forest and range experiment station at Portland, Ore., succeeds to Dean's former position in San Francisco.

* * *

John C. Page, one time Commissioner of Reclamation, is retiring from the Federal service after 36 years of Western reclamation service. He was Commissioner of Reclamation from Jan., 1937, until June, 1943, when he resigned because of ill health. Since 1943, he has been a full time consulting engineer in Denver, and has worked in part on completion of the Colorado River Basin Report and on preliminary studies of the Central Arizona Project. Page indicated that he would serve from time to time when called upon as consultant on reclamation problems.

JOHN C. PAGE

Adolph Teichert, Jr., of Sacramento, Calif., was unanimously nominated national vice-president of the Associated General Contractors of America, Inc., at the fall Board meeting of the organization held in Des Moines, Ia. Teichert is president of A. Teichert & Son, Inc., engineering contractors in Sacramento, who have been in construction work throughout the West since 1878. One of the oldest A.G.C. members in the country, they have been actively identified in Association activities for many years. **Dwight Winkleman,** prominent construction man of Syracuse, N. Y., who has served as national vice-president of the A.G.C., was unanimously nominated for the position of president for 1948.

* * *

Queen & Queen Construction Engineers have located at 1258 E. Baseline, San Bernardino, Calif. Owners **Forest J. Queen** and **Don J. Queen** state they will handle all phases of engineering construction. Affiliated with them at the same address is the organization known as Pacific Industrial Engineers, consisting of **R. M. Nelson, J. L. Queen, Don J. Queen,** and **Forest J. Queen.** Nelson was formerly chief engineer for the Conveyor Co. of Los Angeles. They will specialize in construction engineering, steel fabrication and conveyor systems.

* * *

The results of elections held recently by the San Francisco Bay Area Chapter of the Engineers and Architects Association have been announced. New governors of the Chapter are: **C. T. Ledden,** chairman; **G. L. Beckwith, C. G. Ure, C. D. Hamma, L. C. Gaberel,** and **R. L. Richardson,** governors; **F. A. Gyorgy,** secretary; **R. L. Richardson,** treasurer; and **R. J. Spiegel,** publicity chairman.

* * *

Kirby Smith, vice-president, and **Albert E. Cummings,** research engineer, have been elected directors of the Raymond Concrete Pile Co. at a recent meeting of the board of directors. These new directors will fill the vacancies created by the resignation of **Elihu D. Watt** and the recent death of **Robert A. McMenimen.**

* * *

Alfred Simonson and Associates, Seattle architects, and **E. G. Putnam Co.,** industrial enineers and chemists of Seattle, have merged their organizations and moved to new offices in the Stabbert building. The new firm will be known as Simonson and Putnam, architects and engineers. Simonson heretofore has specialized in residential and commercial construction, and Putnam in design of food processing plants.

* * *

George W. Bull, one time chief engineer of the WPA projects in the Western region, was honored at a recent meeting of the Rocky Mountain States Rensselaer Alumni association in Denver. Bull was graduated in the class of 1897. **Edward H. Dion,** president of the alumni association, came from New York to attend the ceremony.

* * *

S. E. Meserve has been appointed president of the Fluor Corp., Ltd., construction company for the oil, chemical, and allied industries, since the death of **P. E. Fluor,** former president. Other personnel include: **W. Earl Dunn,** vice-president; **D. W. Darnell,** vice-president and general manager; **R. L. Merrick,** chief engineer, and **J. E. Winn,** Western Construction Department.

Paul O. Jones, project engineer in charge of preconstruction work at Hungry Horse dam in northwestern Montana for more than a year and a half, has been transferred to Region 6 headquarters of the Bureau of Reclamation at Billings, Mont., where he will be engaged in work on Missouri River Basin projects. Jones was succeeded at Hungry Horse dam by **Clyde C. Spencer,** formerly construction engineer on the Deschutes project in Oregon.

Roger V. Gillam, structural engineer with Sidney P. Lathrop and Associates, Portland consulting engineering firm, has become a partner in the organization, and the name of the firm has been changed to Lathrop and Gillam. New offices have been opened in the Terminal Sales Building.

Forrest F. Varney has resigned from the government service as senior engineer in the Corps of Engineers, Sacramento, Calif., district office, to accept the position of chief engineer and manager for the Nevada Irrigation District with headquarters in Grass Valley, Calif. He succeeds **William Durbow** who is retiring after 18 years of service with the District.

William M. Kinney, vice-president for promotion of the Portland Cement Association, has retired after 40 years connection with the Portland cement industry. Kinney acted as general manager and secretary for the Association from 1918 to 1931 when he was also elected as a vice-president.

Cornelius Chamberlain has been appointed supervisor of the King County, Washington, consolidated road shops to be established at Renton. The three county road districts have been consolidated to come more directly under the control of **C. Glenn Smith,** county engineer.

W. M. McDaniel, manager of the Salmon River Canal Co. at Twin Falls, Idaho, for the past 13 yr., has resigned in order to operate a farm after 13 yr. as manager of the canal company. **Elmo Farrar,** assistant manager, has been appointed acting manager for the canal company.

Raymond A. Boege, who had been city engineer and superintendent of streets for San Rafael, Calif., since 1937, has now been named to the additional post of city manager by the council with an increase in salary.

George H. Buckler, building contractor of Portland, has been elected chairman of the Portland commission of public docks. He succeeds **T. H. Banfield,** who recently resigned from the commission.

Harry H. Hilp, of the construction firm of Barrett and Hilp in San Francisco, has been appointed to the Lick School Board of Trustees. Hilp is a graduate of Lick, endowed high school and junior college in San Francisco.

Lewis Ambrose, superintendent of the light department of Ellensburg, Wash., has withdrawn his resignation submitted a month ago and will remain as head of the department.

Ray Kuhns, construction engineer for the Montana state highway department, received a 25-yr. award of merit at the annual meeting of the American Association of State Highway Officials held in New York last month.

Lohn R. Ficklin of San Francisco has been named as the first city manager for Petaluma, Calif. He was selected by the City Council of Petaluma from among 11 applicants.

Charles Salcone has been appointed office engineer for the city water department of Yakima, Wash. Salcone is an electrical engineer. During the war he served with the Army Air Forces.

Lester V. Davenport has been appointed engineer for the Lakeview, Ore., soil conservation district which was formed last summer. A program of land leveling and drainage will be undertaken under Davenport's direction.

Virgil C. Bryant, civil engineer, is serving with the Bureau of Reclamation on their Coachella Valley irrigation project in Riverside Co., Calif. He is working on design of the pressure distribution system.

William J. Nelson has been appointed road supervisor for the third district of Kitsap County, Washington, succeeding the late F. R. Pruitt.

SUPERVISING THE JOBS

Roy Chinniei is general superintendent for the flood control project on the Los Angeles River near Burbank, Calif. Joint contractors for the project, consisting of channel improvements and construction of rectangular reinf. conc. section, are United Concrete Pipe Corp., Vinnell Company, Inc., and Ralph A. Bell, all of Calif. **Glenn Morgan** is resident engineer for the Corps of Engineers on the $2,500,000 project. Foremen for the contractors are **Glenn Guy** and **Robert Skamnes**, carpenters; **Harold McNees**, steel; **Arthur Nelson**, concrete; **William Dunbar**, laboratory; **Jim Clark**, shop; and **Charles Shoop**, **Howard Norton** and **C. D. Lee**, grading operations. **K. T. Norwood** is job engineer, and **R. E. Almanzan**, office engineer. Chiefs of the surveying parties are **T. D. McCallon**, **E. P. Clinton**, and **J. N. Pratt**, and **Jim Finn** is purchasing agent. **William Green** is the master mechanic.

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E. W. Simpson is superintendent for the Macco Corp. of Clearwater, Calif., who have the subcontract for the construction of twin 10-ft. submarine pipe lines for the Edison Co. at Redondo Beach, Calif., while **V. D. Casey** is assistant superintendent. Pipe laying foremen on the project are **Phil Swafford**, **Pat Swafford**, and **Dean Chard**, and pile trestle foremen are **John Purvis**, **Vic Hensley**, and **George Cooper**. **Scotty Chisholm** is the master diver, and divers are **Charley Lindquist**, **Willie Thompson**, **Dick Jones**, and **Noel Bottomley**.

* * *

Jim Lindsay is superintendent for Barrett & Hilp on construction of a new $2,000,000 grease plant at Richmond, Calif., for the Standard Oil Co., while **Frank Johnston** is assistant superintendent. **Bill Joyce** is general foreman on the job, and carpenter foremen are **Howard Severance**, **C. "Knobby" Andreason**, and **Clift Kjer**. Other personnel on the job are **Ty Helli**, labor foreman; **Ted Rhodes**, office manager; **Al Ragan**, paymaster; **Ben Raffin**, head engineer; and **Bill Renwick**, assistant engineer. The two-story building will be 1,000 ft. long and 450 ft. wide.

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Wes Myers is superintending 2.6 mi. of grading and paving construction on Highway 99, Castaic, Calif., for Clyde W. Wood, Inc. **Stanley Wood** is project manager and **Roy Cooley** is resident engineer. Foremen on the job are **Harry Schultze**, concrete; **George Lewis**, earthwork; **Roy Chenowith**, crusher operations; **Dan Ironcale**, labor foreman, and **George Burnett**, grade foreman.

* * *

Homer Henson is the superintendent for the Stewart Construction Co. of Phoenix, Ariz., on their school construction job in Yuma, Ariz. **Phillip Twohy** is project manager for work on the three schools, and general foremen are **Harry Faulkner**, **L. S. McCombs**, and **H. B. Dillow**. **Jim Carmichael** is labor foreman; **James Elrod** and **R. E. Hayworth**, carpenter foremen, and **Guy Hickman**, steel foreman.

ROBERT BARNES, left, general foreman; CHET WHITTEKIEND, superintendent, for Morrison-Knudsen Co., Inc., of Boise, on widening of 10.5 mi. of Highway 30 between New Plymouth and Caldwell, Ida.

A. V. Roemisch is acting as superintendent for the E. S. McKittrick Co. on their job of constructing 380 precast houses at the U. S. Naval Ordnance Test Station near Inyokern, Calif. **R. E. Duba** is project manager, and **Adolf Brandt** is field superintendent. **J. O. Peterson** and **J. A. Mathisen** are plant superintendents, **R. A. Mathisen** is general foreman, and **T. H. Bean** is office manager. **Captain H. L. Mathews** is resident engineer for the Navy. E. O. Nay has the sub-contract on the project for plumbing. Superintendent for Nay is **Bill Sasser**, and general foremen are **L. L. Frizzell**, **Carl Werle**, **Kenny McCormick**, **George Humphreys**, **Charles Allen**, and **"Red" Forquerson**.

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Wayne C. Foster is job engineer and **A. J. Mansur** is job superintendent for the Del E. Webb Construction Co., while **Leon W. Jackson** is resident engineer for Headman, Ferguson and Carollo, on construction of the new City of Phoenix, Ariz., water treatment plant on the Verde River northeast of the city. The new million-dollar water filter plant, first unit in a $6,000,000 water improvement program for the city, will be capable of purifying 30,000,000 gallons of water a day and should be completed in about thirteen months.

* * *

Project manager for the Guy F. Atkinson Co. on their job of road construction between Tehachapi and Keene in California is **H. S. Booth**, and **J. W. Cole** is resident engineer. Foremen for the contractor are **Wayne Wooten** for the operating engineers, **Walter Tate**, concrete; **Joe Demo** for the laboratory; and **Louie Montgomery**, drill foreman. **L. W. Smith** is master mechanic on the project, and **T. F. Foran** is office manager. **W. J. Silberberger** is superintendent for J. B. Stingfellow, who has the subcontract for the slope paving, bridge abutments, and debris walls. Key men for Stingfellow are **R. L. Guillemin**, concrete foreman; **John Dingle**, rock foreman, and **F. J. Silberberger, Jr.**, office manager.

* * *

William Graf is superintendent for the Wm. Radkovich Co. on their construction of concrete living quarters at the Yuma Test Branch near Yuma, Ariz., for the Army. **George Davis** is resident engineer, and **Tom Harkins** is general foreman. Other foremen are **Joe Castillo**, laboratory, and **Hal MacIntyre** for the steel work. **Vern Slade** is service engineer for the LeTourneau Co. on the job.

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Jack Taylor is job superintendent for the William Radkovich Co. of Los Angeles on the construction of light weight concrete houses for personnel of the U. S. Naval Ordnance Test Station near Inyokern on the Mojave Desert, Calif., while **Jim Mattingly** is superintendent of utilities. Gluck & Son are subcontractors for the plumbing and Drury Electric Co. are subcontractors on the electric work for the project.

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M. J. "Slim" Allred is superintendent for W. R. Skousen, Mesa, Ariz., on the construction of 7.7 mi. of base and surfacing 15 mi. east of Yuma. **Mulford Windsor** is resident engineer on the $139,211 job, and **Lee Ward** is crusher foreman. Other key men on the job are **Joe Krulyac**, purchasing agent, **Ed Oldham, Jr.**, office manager, and **Deward Morris**, shop foreman.

* * *

Howard Hill, for many years a key man for Robert E. McKee of Los Angeles, Calif., is now superintendent on the new building under construction at San Bernardino, Calif., by McKee for the J. C. Penney Co. **Dave E. Walters** is engineer on the project and Frank Morrell is carpenter foreman.

* * *

Jack L. Adams was general superintendent for the Winston Bros. Co. on their recently completed highway construction job 9 mi. north of Castaic, Calif. **Glen G. McAfee** was assistant superintendent, while **F. A. Reed** was resident engineer and **Jack Yount** acted as project manager.

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J. F. Cummings' superintendent for the construction of personnel facilities at the U. S. Army Test Base 3 mi. northeast of Imperial Dam near Yuma, Ariz., is **R. A. Graham**. **John Stedam** is assistant superintendent, **George Davis** is the resident engineer, and **Al Sorenson** is acting as mill foreman.

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Paul Molino is now an engineer for Duncanson & Harrelson Construction Co. at Richmond, Calif. He is working as maintenance mechanic and welder on their tugs, cranes and other machinery.

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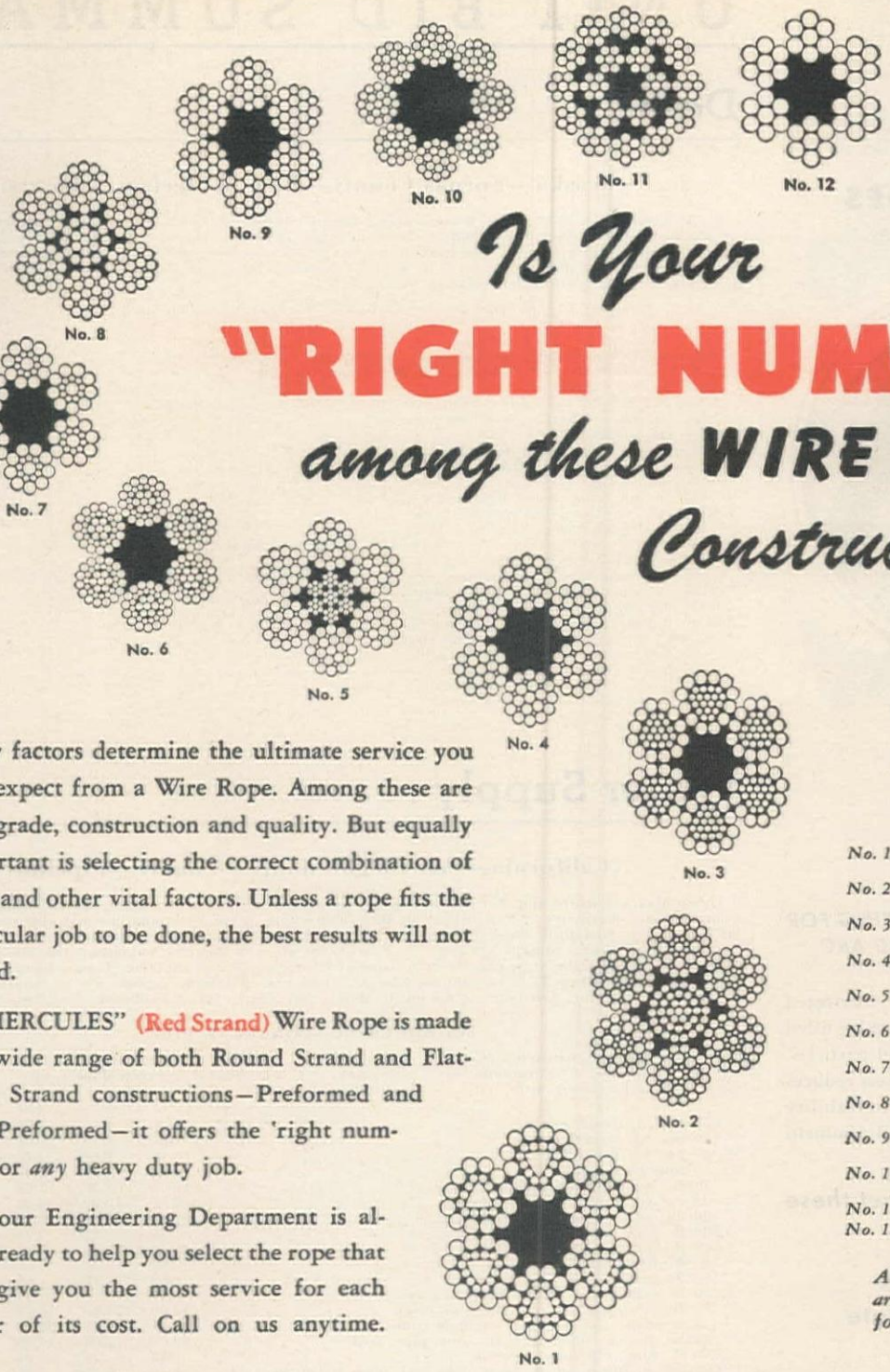
Walter D. Merrigan is supervising construction for O. J. Scherer Co. of Las Vegas, Nev., of truck stations for the Richfield Oil Co. in Phoenix, Ariz., and other cities in the Southwest.



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UNIT BID SUMMARY

Dam . . .

Nebraska—Furnas County—Bur. of Reclam.—Diversion

J. A. Terteling & Sons, Inc., Boise, Idaho, with the bid of $367,683, were low of two before the Bureau of Reclamation for the construction of the Cambridge Diversion Dam for the Frenchman Cambridge Unit of the Missouri Basin Project. The work involves a 350-ft. overflow weir to be constructed across the Republican River and installation of six 10-ft. by 14-ft. hand-operated radial gates furnished by the Government. Unit prices for the two bidders were as follows:

(1) J. A. Terteling & Sons, Inc. ..... $367,683 (2) L. G. Barcus & Sons $406,908

	(1)	(2)
Lump sum, diversion and care of river and unwatering foundations	$21,000	$9,230
140,000 cu. yd. excavation, common, except stripping for dike	.16	1.50
3,200 cu. yd. excavation, rock	7.19	15.16
360 gal. furnish and apply coating matl. to the surfaces of shale excav.	1.45	3.90
2,600 cu. yd. excavation, stripping for dike	.22	.75
4,000 cu. yd. backfill	.17	2.15
4,000 cu. yd. compacting backfill	6.75	2.90
9,100 cu. yd. compacted dike	.30	.83
5,000 sta. cu. yd. overhaul	.045	.20
85 cu. yd. constructing filter and gravel fills	5.00	14.60
100 cu. yd. placing riprap 6 in. thick	14.38	12.50
150 cu. yd. placing riprap 24 in. thick	14.38	11.00
650 cu. yd. placing riprap 24 in. thick with 8-in. gravel blanket	18.60	12.50
50 sq. yd. dry-rock paving	11.90	9.90
6,600 bbl. furnishing and handling cement	5.85	5.00
3,200 cu. yd. concrete in overflow weir	40.25	44.25
1,250 cu. yd. concrete in structures	54.62	56.35
265,000 lb. furnishing and placing reinf. bars	.12	.12
650 sq. ft. furnishing and placing elastic joint-filler material	1.45	.50
600 lin. ft. placing rubber water stop	1.45	1.60
400 lin. ft. furnishing and placing asbestos-cement pipe	1.80	2.05
43,200 lb. installing radial gates and gate hoists	.045	.09
5,200 lb. installing misc. metalwork	.20	.09

Water Supply . . .

California—San Diego County—County—Pipeline

Green-Mears Construction Co., Los Angeles, submitted the low bid of $291,184 on Schedule 1-C to the County Water Authority at San Diego, for the construction of concrete pipe line and appurtenant structures for the easterly portion of the Fallbrook-Oceanside Branch of the San Jacinto-San Vicente Aqueduct; betw. Station 0 plus 07 and Station 316 plus 15. Edward Green, Los Angeles, submitted the low bid of $287,134 on Schedule 1-S for the same construction using steel pipe instead of concrete. Inside diameter of the pipe is 16-in. and the length is 31,810-ft. Work is located from near Rainbow, approx. 1½ mi. south of San Diego-Riverside County line, a distance of 6.9 mi. to about 2 mi. southwest of Fallbrook. Unit bids follow:

SCHEDULE 1-C—CONCRETE PIPE

(1) Green-Mears Construction Co. $291,184
(2) M. F. Kemper Construction Co. 291,221
(3) Haddock-Engineers Ltd 296,492
(4) Edward Green $299,879
(5) United Concrete Pipe Corp. 311,235

	(1)	(2)	(3)	(4)	(5)
21,000 cu. yd. trench excav.	2.00	1.50	2.30	1.75	2.50
120 cu. yd. struct. excav.	5.00	5.00	6.00	6.00	6.00
18,310 cu. yd. backfill	1.00	8.00	1.00	1.00	.70
10 tons rock refill	10.00	3.00	6.00	6.00	10.00
50 cu. yd. sand for backfill	10.00	3.00	5.00	5.00	5.00
35 cu. yd. concrete in structure	100.00	70.00	90.00	100.00	100.00
20 cu. yd. concrete for cradles	50.00	25.00	90.00	25.00	40.00
3,500 lb. furn. and pl. reinf. steel	.20	.12	.15	.15	.17
1,000 lb. furn. and pl. struct. steel	.50	.25	.40	.25	.50
3,700 lb. furn and pl. steel pipe	.80	.50	.60	.60	.50
300 lb. furn. and pl. ladder rungs	1.00	.30	.35	.25	.40
2,300 lb. furn and pl. manhole frames and covers	.20	.15	.15	.18	.30
12 ft. furn. and pl. conc. manhole rings	12.00	20.00	14.00	12.00	8.00
18 ft. furn. and pl. conc. manhole cones	15.00	20.00	20.00	15.00	20.00
44 lin. ft. furn. and pl. 36-in. conc. pipe, struct.	10.00	12.00	14.00	12.50	10.00
1,600 lb. furn. C.I. pipe specials	.80	.25	.30	.25	.40
21,090 lin. ft. furn. and pl. 16-in. conc. cyl. pipe, 400-ft. head	6.50	7.10	6.50	6.90	7.00
4,200 lin. ft. same, 500-ft. head	6.50	7.10	6.50	6.90	7.00
6,520 lin. ft. same, 625-ft. head	7.00	7.25	6.95	7.50	7.35
6 ea. 3-in. gate valves, 200 lb.	50.00	30.00	35.00	50.00	60.00
2 ea. 3-in. gate valves, 400 lb.	50.00	40.00	60.00	70.00	60.00
6 ea. 2-in. plug valves, 200 lb.	50.00	20.00	25.00	25.00	40.00
3 ea. 2-in. plug valves, 400 lb.	50.00	30.00	35.00	45.00	40.00
6 ea. 2-in. air valves, 150 lb.	50.00	150.00	75.00	80.00	200.00
3 ea. 2-in. air valves, 300 lb.	50.00	200.00	75.00	200.00	210.00
5 ea. 1-in. corp. cocks	25.00	10.00	8.00	15.00	10.00
12,500 lb. setting metal work	.10	.10	.08	.25	.20
Lump sum, Fallbrook control station	$5,000	$6,000	$6,000	$7,500	$4,000
75 lb. furn. and pl. misc. non-ferrous metals	2.00	1.00	1.00	1.00	3.00
440 sq. ft. asph. manhole slabs	.50	1.00	.80	.60	1.00

SCHEDULE 1-S—STEEL PIPE

(1) Edward Green $287,134
(2) Haddock-Engineers Ltd. $322,506
(3) Pacific Pipeline & Engineers, Ltd. $358,028

	(1)	(2)	(3)
20,450 cu. yd. trench excav.	1.75	2.30	2.30
120 cu. yd. struct. excav.	6.00	6.00	5.00
18,140 cu. yd. backfill	1.00	1.00	1.50
10 tons rock refill	6.00	6.00	5.00
50 cu. yd. sand backfill	5.00	5.00	3.50
35 cu. yd. conc. in struct.	100.00	90.00	60.00
20 cu. yd. conc. in cradles	25.00	90.00	30.00
3,500 lb. furn. and pl. reinf. steel	.15	.15	.15

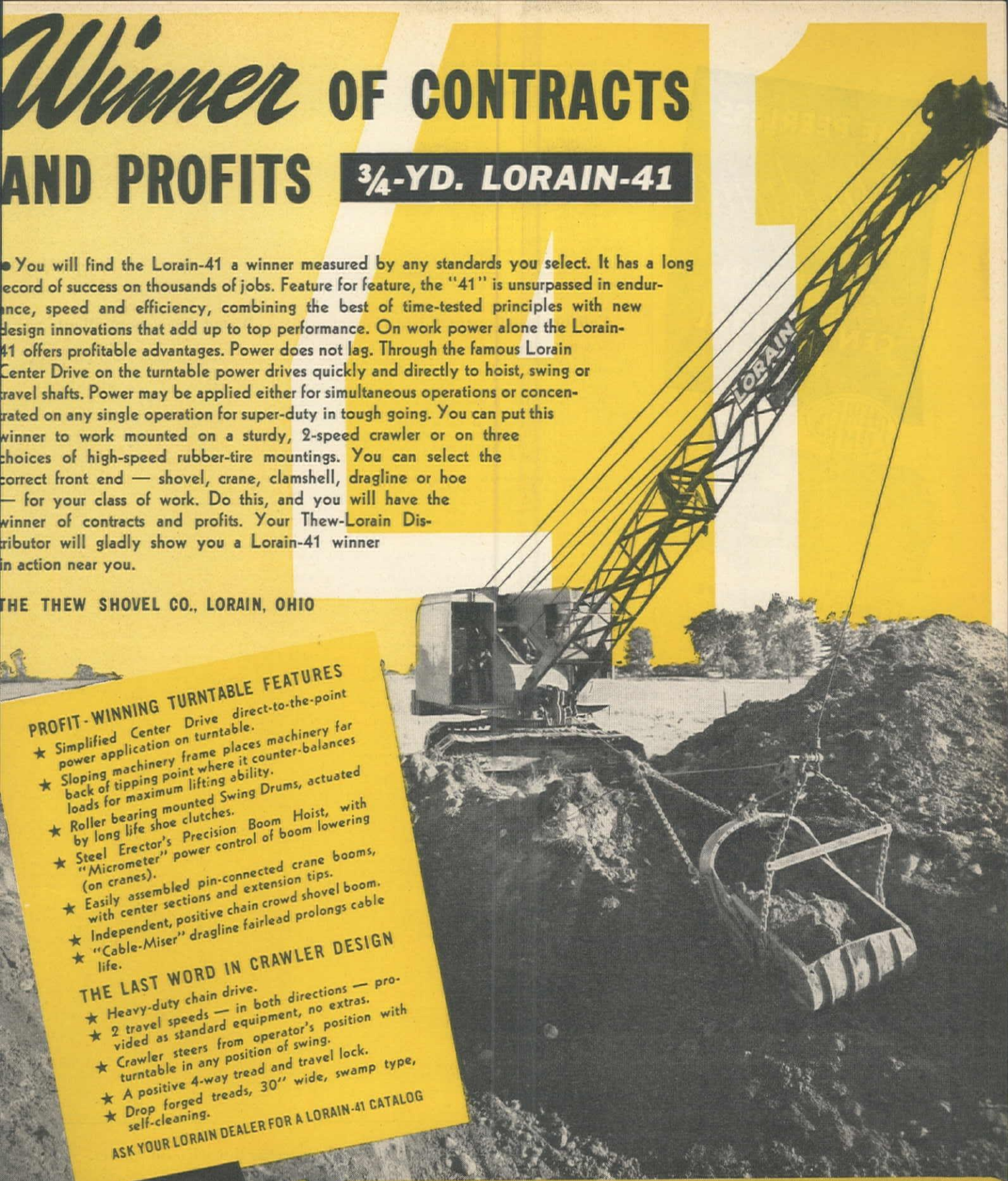
(Continued on next page)

Winner OF CONTRACTS AND PROFITS

¾-YD. LORAIN-41

You will find the Lorain-41 a winner measured by any standards you select. It has a long record of success on thousands of jobs. Feature for feature, the "41" is unsurpassed in endurance, speed and efficiency, combining the best of time-tested principles with new design innovations that add up to top performance. On work power alone the Lorain-41 offers profitable advantages. Power does not lag. Through the famous Lorain Center Drive on the turntable power drives quickly and directly to hoist, swing or travel shafts. Power may be applied either for simultaneous operations or concentrated on any single operation for super-duty in tough going. You can put this winner to work mounted on a sturdy, 2-speed crawler or on three choices of high-speed rubber-tire mountings. You can select the correct front end — shovel, crane, clamshell, dragline or hoe — for your class of work. Do this, and you will have the winner of contracts and profits. Your Thew-Lorain Distributor will gladly show you a Lorain-41 winner in action near you.

THE THEW SHOVEL CO., LORAIN, OHIO



PROFIT-WINNING TURNTABLE FEATURES

★ Simplified Center Drive direct-to-the-point power application on turntable.
★ Sloping machinery frame places machinery far back of tipping point where it counter-balances loads for maximum lifting ability.
★ Roller bearing mounted Swing Drums, actuated by long life shoe clutches.
★ Steel Erector's Precision Boom Hoist, with "Micrometer" power control of boom lowering (on cranes).
★ Easily assembled pin-connected crane booms, with center sections and extension tips.
★ Independent, positive chain crowd shovel boom.
★ "Cable-Miser" dragline fairlead prolongs cable life.

THE LAST WORD IN CRAWLER DESIGN

★ Heavy-duty chain drive.
★ 2 travel speeds — in both directions — provided as standard equipment, no extras.
★ Crawler steers from operator's position with turntable in any position of swing.
★ A positive 4-way tread and travel lock.
★ Drop forged treads, 30" wide, swamp type, self-cleaning.

ASK YOUR LORAIN DEALER FOR A LORAIN-41 CATALOG

See Your THEW Lorain Dealer

BUNTING TRACTOR CO., Inc. *Boise, Twin Falls, Gooding, Fairfield, Burley, Carey, Idaho La Grande, Oregon*
CATE EQUIPMENT CO. . . . . *Salt Lake City 4*
CENTRAL MACHINERY CO. . . . *Great Falls and Havre, Mont.*
COAST EQUIPMENT CO. . . . . *San Francisco 3*
A. H. COX & COMPANY . . . . . *Seattle 4, Wash.*
P. L. CROOKS & CO., INC. . . *Portland 10, Ore.*
LE ROI-RIX MACHINERY CO. . . . *Los Angeles 11*
LIBERTY TRUCKS & PARTS CO. . . . . *Denver 1*
MOUNTAIN TRACTOR CO. . . . . *Missoula and Kalispell, Mont.*
LEE REDMAN EQUIPMENT CO. . . . *Phoenix, Arizona*
SANFORD TRACTOR & EQUIPMENT CO. . . *Reno, Nev.*
TRACTOR & EQUIPMENT CO. . . . . *Sidney, Mont.*
Branch: Miles City Equip. Co., Miles City, Mont.
WORTHAM MACHINERY CO. . . . . *Cheyenne, Wyo., Billings, Mont. Branches: Sheridan, Greybull, Casper and Rock Springs, Wyo.*

1,000 lb. furn. and pl. struct. steel	.25	.40	.40
3,700 lb. furn. and pl. steel pipe	.60	.60	.70
300 lb. furn. and pl. ladder rungs	.25	.35	.40
2,300 lb. furn. and pl. manhole covers and frames	.18	.15	.20
12 ft. furn. and pl. manhole rings	12.00	14.00	15.00
18 ft. furn. and pl. manhole cones	15.00	20.00	20.00
44 lin. ft. furn. and pl. 36-in. conc. pipe for struct.	12.50	14.00	15.00
1,600 lb. furn. C.I.P.	.25	.30	.30
24,370 lin. ft. 3/16-in. welded steel pipe	6.50	7.32	8.15
7,440 lin. ft. ¼-in. welded steel pipe	7.00	7.90	8.74
6 ea. 3-in. gate valves	50.00	35.00	25.00
2 ea. 3-in. gate valves, 400 lb.	70.00	60.00	35.00
6 ea. 2-in. plug valves, 200 lb.	25.00	25.00	25.00
3 ea. plug valves, 400 lb.	45.00	35.00	35.00
6 ea. 2-in. air valves, 150 lb.	80.00	75.00	75.00
3 ea. 2-in. air valves, 300 lb.	200.00	75.00	175.00
5 ea. 1-in. corp. cocks	15.00	8.00	25.00
12,500 lbs. care for metal work	.25	.08	.10
Lump sum, Fallbrook control sta. super struct.	$7,500	$6,000	$7,500
75 lb. furn. and pl. non-ferrous metals	1.00	1.00	1.00
440 sq. ft. asph. manhole slabs	.60	.80	.50

California—Contra Costa County—City—Water Treatment Plant

Haas & Rothschild, San Francisco, submitted the low bid of $503,840 (Alt. B) and were awarded the contract by the Antioch City Council for the construction of a water treatment plant complete with connections to existing facilities. Unit bids were as follows:

	Alt. A	Alt. B
(A) Haas & Rothschild	$504,761	$503,840
(B) Fred J. Early Jr. Co., Inc.	543,463	542,521
(C) Johnson, Drake & Piper	592,380	592,380
(D) MacDonald, Young & Nelson	592,480	592,480
(E) Peter Kiewit Sons Co.	594,829	593,829
(F) M & K Corp.	598,016	597,416

(1) lump sum, sedimentation basin structure excepting (a) piping and drain lines and (b) raw water 24-in. C.I. supply.
(2) lump sum, floculation tank struct. compl. except piping and drain lines and elec. work.
(3) lump sum, wash water tank except piping and drain lines.
(4) lump sum, filter house except (a) piping and drain lines, (b) electrical work, (c) elevator, (d) alternate "A" and "B" for controllers.
(5) lump sum, Alt. "A" for flow controllers in filter house.
(6) lump sum, Alt. "B" for flow controllers in filter house.
(7) lump sum, one hydr. elevator in filter house.
(8) lump sum, filtered water basin except elec. work and piping and drain lines.
(9) lump sum, one lot piping and drain lines in and around plant compl. with fittings, valves, manholes.
(10) 1,000 lin. ft. 24-in. cast iron raw water line (pipe furnished by city).
(11) 875 lin. ft. 36-in. asbestos bonded paved invert, corrug. pipe from discharge struct. at mud and sludge reservoir to MH. No. 2 except discharge struct., bends, tee and manholes.
(12) lump sum, mud and sludge reservoir with culvert discharge struct., dam, spillway, levee and all appurtenances.
(13) lump sum, furnish and install all electric power, light and control circuits, switchboard, motor starting equipment, lighting equipment, switches, receptacles, and other accessories.
(14) 16 ea. Monotube pendant lighting standards with conc. foundations.
(15) one 18 x 24-in. conc. pull box electrolier.
(16) 220 lin. ft. 1½ in., 3 No. 6 conduit and wire for electrolier.
(17) 810 lin. ft. 1¼ in., 2 No. 6 conduit and wire for electrolier.
(18) 385 lin. ft. 1 in., 2 No. 8 conduit and wire for electrolier.
(19) 170 sq. yd. paved walkways and steps.
(20) 3,000 sq. yd. roadway pavement.
(21) lump sum, plant grading including the removing, stock piling and replacement of top soil.
(22) 50 cu. yd. selected backfill.
(23) 30 cu. yd. gravel backfill.
(24) 20 cu. yd. conc. (Class C-4 sack) backfill under walls and footings.

	(A)	(B)	(C)	(D)	(E)	(F)
(1)	$71,473.00	$91,621.00	$84,552.00	$112,000.00	$90,500.00	$98,400.00
(2)	24,364.00	31,384.00	32,600.00	33,000.00	38,600.00	35,500.00
(3)	17,881.00	18,660.00	18,634.40	19,000.00	24,400.00	19,900.00
(4)	119,983.00	152,000.00	161,383.00	140,000.00	150,700.00	152,000.00
(5)	24,000.00	10,745.00	29,253.00	20,000.00	25,500.00	25,750.00
(6)	23,778.00	9,433.00	29,456.00	20,000.00	24,500.00	25,150.00
(7)	10,531.00	10,100.00	10,094.00	9,000.00	9,300.00	10,500.00
(8)	59,814.00	76,142.00	70,394.00	68,000.00	68,600.00	69,500.00
(9)	107,869.00	75,506.00	97,810.00	111,000.00	118,400.00	114,000.00
(10)	8.30	11.00	17.60	17.00	7.00	8.25
(11)	17.00	21.50	24.64	20.00	21.50	18.00
(12)	10,869.00	11,862.00	11,326.00	16,750.00	9,500.00	17,800.00
(13)	10,565.00	10,600.00	10,710.00	9,000.00	10,800.00	10,900.00
(14)	200.00	205.00	207.00	200.00	200.00	222.00
(15)	48.00	65.00	48.00	40.00	50.00	50.00
(16)	1.50	1.50	1.50	15.00	1 .40	1.60
(17)	1.40	1.50	1.40	1.50	1.30	1.50
(18)	1.20	1.25	1.10	1.00	1.00	1.20
(19)	4.00	4.00	4.20	2.00	1.30	3.50
(20)	3.60	3.75	4.10	3.50	2.10	3.80
(21)	6,014.00	6,500.00	7,460.00	3,000.00	10,000.00	6,250.00
(22)	6.00	12.00	2.00	2.00	8.00	3.00
(23)	7.00	16.00	6.40	4.00	10.00	8.00
(24)	18.00	26.00	18.00	50.00	20.00	25.00

Irrigation . . .

Idaho—Gooding—Bur. of Reclam.—Earthwork and Struct.

Duffy Reed Construction Co., Twin Falls, submitted the low bid of $91,670, and was awarded the contract by the Bureau of Reclamation for construction of earthwork, lateral lining and structures for canal and lateral distribution system to serve 4,500 ac. of new land on the Gooding Division, Minidoka Project. The unit bids for the two schedules were as follows:

	Sched. No. 1	Sched. No. 2	Total
(A) Duffy Reed Construction Co.	$29,499	$62,171	$91,670
(B) Marshall & Haas	27,225	68,332	95,557
(C) Humphrey-Ketchen Co.	27,408	68,303	95,711
(D) A. D. McKenzie	34,782	82,315	117,097
(E) Hansen & Parr Construction Co.	34,899	92,812	127,712
(F) Barnhart & Wheeler	41,619	89,270	130,890
(G) Aslett & Sons Construction Co.	39,002	93,693	132,715
(H) Carl E. Nelson Co.	40,807	100,905	141,713
(I) J. A. Terteling & Sons, Inc.	40,604	105,447	146,051
(J) Vernon Brothers Co.	49,587	101,077	150,664

(Continued on next page)

SCHEDULE No. 1

(1) 28,000 cu. yd. excav., common, for laterals.
(2) 1,000 cu. yd. excav., rock, for laterals.
(3) 5,000 sta. yd. overhaul.
(4) 2000 cu. yd. compacting embankments.
(5) 450 cu. yd. excav., common, for structs.
(6) 20 cu. yd. excav., rock, for structs.
(7) 350 cu. yd. backfill about structs.
(8) 300 cu. yd. compacting backfill about structs.
(9) 200 cu. yd. placing earth lining in rock cut sections.
(10) 60 sq. yd. dry rock paving.
(11) 105 cu. yd. concrete in structs.
(12) 1,710 C lb. furn. and placing pneum. applied mortar.
(13) 260 bbl. furn. and handling Portland cement.
(14) 6,400 lb. furn. and placing reinf. bars.
(15) 2 M.f.b.m. furn. & erecting timber in structs.
(16) 1,500 lb. installing gates and misc. metal wk.
(17) 370 lin. ft. laying 15-in. diam. conc. pipe.
(18) 21 lin. ft. laying 18-in. diam. conc. pipe.
(19) 150 lin. ft. laying 24-in. diam. conc. pipe.

SCHEDULE No. 2

(20) 110,000 cu. yd. excav., common, for laterals.
(21) 1,100 cu. yd. excav., rock, for laterals.
(22) 30,000 sta. yd. overhaul.
(23) 500 cu. yd. compacting embankments.
(24) 700 cu. yd. excav., common, for structs.
(25) 20 cu. yd. excav., rock, for structs.
(26) 700 cu. yd. backfill about structs.
(27) 600 cu. yd. compacting backfill about structs.
(28) 400 cu. yd. placing earth lining in rock cut sections.
(29) 70 sq. yd. dry rock paving.
(30) 200 cu. yd. concrete in structs.
(31) 3,000 C lb. furn. and placing pneum. applied mortar.
(32) 475 bbl. furn. and handling Portland cement.
(33) 12,000 lb. furn. and placing reinf. bars.
(34) 7 M.f.b.m. furn. and erecting timb. in structs.
(35) 4,500 lb. installing gates and misc. metal wk.
(36) 750 lin. ft. laying 15-in. diam. conc. pipe.
(37) 170 lin. ft. laying 18-in. diam. conc. pipe.
(38) 280 lin. ft. laying 24-in. diam. conc. pipe.
(39) 32 lin. ft. laying 30-in. diam. conc. pipe.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	I)	(J)
(1)	.20	.30	.30	.34	.47	.31	.45	.48	.58	.46
(2)	5.00	3.00	4.00	5.00	2.86	12.00	8.00	5.00	7.70	11.00
(3)	.03	.05	.04	.04	.08	.02	.05	.03	.03	.05
(4)	.25	1.00	1.00	.50	.70	1.00	1.00	.20	.75	1.30
(5)	2.50	2.00	1.00	3.00	3.30	1.50	2.00	4.00	.75	1.40
(6)	10.00	10.00	5.00	10.00	7.20	20.00	8.00	10.00	8.00	11.00
(7)	.50	1.00	.50	1.00	.50	.50	.75	2.00	.36	1.10
(8)	1.50	2.00	1.00	1.00	1.90	1.50	1.00	.50	3.60	1.25
(9)	1.00	1.00	1.50	2.00	.89	5.00	1.00	1.00	1.05	3.50
(10)	10.00	5.00	4.00	6.00	12.70	5.00	7.00	10.00	6.20	6.20
(11)	75.00	60.00	60.00	65.00	78.78	65.00	75.00	60.00	71.00	81.00
(12)	2.25	1.20	1.40	3.00	1.18	3.50	2.50	4.50	1.20	5.60
(13)	5.60	6.00	7.00	6.00	5.98	7.50	5.00	5.50	7.30	5.10
(14)	.20	.14	.12	.12	.15	.15	.12	.15	.17	.12
(15)	250.00	200.00	250.00	2.20	282.00	200.00	250.00	300.00	259.00	140.00
(16)	.25	.25	.25	.50	.28	.25	.20	.20	.31	.50
(17)	1.00	2.00	1.50	3.00	2.05	1.75	1.00	2.00	.95	2.20
(18)	1.00	2.50	1.50	5.00	2.52	2.25	2.00	2.50	1.25	2.20
(19)	1.50	3.00	2.00	5.00	2.84	3.00	2.00	3.00	1.50	3.00
(20)	.20	.30	.30	.34	.47	.31	.45	.48	.58	.36
(21)	3.50	3.00	4.00	5.00	2.86	12.00	8.00	5.00	7.70	11.00
(22)	.03	.05	.04	.04	.08	.03	.04	.03	.03	.05
(23)	.25	1.00	1.00	.50	.70	1.00	.50	.20	.75	1.30
(24)	2.50	2.00	1.00	3.00	3.30	2.00	2.00	4.00	.75	1.40
(25)	10.00	5.00	5.00	10.00	7.20	20.00	8.00	10.00	8.00	11.00
(26)	1.50	1.00	.50	1.00	.50	.50	.50	2.00	.36	1.10
(27)	.50	2.00	1.50	1.00	1.90	1.50	1.00	.50	3.60	1.25
(28)	1.00	1.00	1.50	2.00	.89	5.00	1.00	1.00	1.05	3.50
(29)	10.00	10.00	4.00	5.00	12.70	5.00	7.00	10.00	6.20	6.20
(30)	75.00	60.00	60.00	65.00	78.78	65.00	75.00	60.00	71.00	78.00
(31)	2.25	1.20	1.40	3.00	1.18	3.50	2.50	4.50	1.20	5.60
(32)	5.60	6.00	7.00	6.00	5.98	7.50	5.00	5.50	7.30	5.40
(33)	.20	.14	.12	.12	.15	.15	.12	.15	.17	.12
(34)	250.00	200.00	250.00	2.20	282.00	200.00	250.00	300.00	259.00	140.00
(35)	.20	.25	.25	.50	.28	.25	.20	.20	.31	.50
(36)	1.00	2.00	1.50	3.00	2.05	1.75	1.00	2.00	.95	2.25
(37)	1.00	2.50	2.00	5.00	2.52	2.25	1.20	2.50	1.25	2.25
(38)	1.50	3.00	3.00	5.00	2.84	7.00	2.00	3.00	1.50	3.00
(39)	3.00	3.50	4.00	5.00	3.00	4.00	2.00	4.00	2.85	4.00

Sewerage . . .

California—Contra Costa County—County—Trunk Sewer

Tom Gogo, Los Angeles, submitted the low bid of $428,769 and was awarded the contract by the Central Contra Costa Sanitation District for construction of the main trunk sewer, Section 1, from the treatment plant north of Pacheco to south of Walnut Creek; 270 calendar days were allowed for completion. The unit bids follow:

(A) Tom Gogo $428,769
(B) Steve Rados 476,911
(C) Downer Co. 497,473
(D) Martin Construction Co. 545,635
(E) McGuire & Hester $596,104
(F) B C K Construction Co. 642,805
(G) M & K Corp. 643,281
(H) P & J Artukovich 669,867

(1) 4,180 lin. ft. 39-in. centrif. cast reinf. conc. pipe with tongue and groove joints.
(2) 3,000 lin. ft. 39-in. centrif. cast reinf. conc. pipe with collar joints.
(3) 7,390 lin. ft. 36-in. centrif. cast reinf. conc. pipe with tongue and groove joints.
(4) 7,570 lin. ft. 33-in. same.
(5) 250 lin. ft. 33-in. extra strong centrif. cast reinf. conc. pipe with collar joints.
(6) 18,650 lin. ft. 30-in. centrif. cast reinf. conc. pipe with tongue and groove joints.
(7) 70 lin. ft. 30-in. centrif. cast reinf. conc. pipe with collar joints.
(8) 200 lin. ft. 30-in. extra strong centrif. cast reinf. conc. pipe with collar joints.
(9) 32 lin. ft. 30-in. extra strong centrif. cast reinf. conc. pipe with collar joints in tunnel including tunnel and tunnel backfill.
(10) 200 lin. ft. 12-in. DS vit. clay sewer pipe.
(11) 40 lin. ft. 24-in. diam. corrug. iron culv. pipe.
(12) 1 steel bridge creek crossing over Walnut Creek, including piers, 30-in. steel pipe and manhole.
(13) 1 steel bridge creek crossing over San Ramon Creek, incl. piers and 30-in. steel pipe.
(14) 100 cu. yd. conc. (5 sacks) for imbedding pipe and protective weirs.
(15) 24 ea. 60-in. ID standard manholes.
(16) 29 ea. 48-in. same.
(17) 2 ea. 8-in. VC stub lateral capped.
(18) 2 ea. 12-in. same.
(19) 1 ea. 15-in. same.
(20) 1 ea. 15-in. x 10-ft. long VC stub lateral capped.
(21) 2 ea. 18-in. VC stub lateral capped.
(22) 1 ea. 27-in. RC stub lateral capped.
(23) 1 ea. 6-in. drop inlet lateral connection of existing sewer.
(24) 1 ea. 12-in. same.
(25) 8,000 lb. reinf. steel in protective structs.
(26) 100 cu. yd. coarse gravel for bedding pipe.
(27) 20 cu. yd. extra excav. for bridge piers below elevations shown on plans.
(28) 20 cu. yd. extra struct. conc.
(29) 10 ea. labor and matls. for resetting existing survey monuments.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
(1)	10.50	14.85	13.00	15.35	16.15	15.00	15.70	15.00
(2)	12.00	17.55	15.00	16.00	18.00	18.30	17.60	18.00
(3)	9.30	12.60	12.00	12.35	16.15	14.20	14.60	15.00
(4)	9.00	8.75	11.00	11.35	14.80	13.40	13.90	14.00
(5)	13.00	15.50	15.00	12.35	20.20	16.75	19.00	20.00
(6)	8.20	7.95	9.20	10.44	10.55	13.00	13.00	14.50
(7)	12.00	15.00	12.00	11.35	39.70	19.20	15.00	23.00
(8)	12.00	16.50	13.00	11.35	14.20	15.65	17.00	23.00

(Continued on next page)

Loading Magic

Athey Force-Feed Loader & "Caterpillar" Motor Grader Bring New Ease and Low Costs to Many Highway Jobs....

Wide Range of Uses

The Athey Force-Feed Loader and "Caterpillar" Motor Grader provides a fast, precise "package" for a wide variety of highway jobs. For cleaning or building ditches, road widening or resurfacing, dressing slopes or shoulders, loading oil mix, this team is unexcelled for high output and speedy production.

Clean, Precise Pick-up

The self-propelled, hydraulically-controlled Force-Feed Loader does a neat, clean job of picking up windrows of material left by the Motor Grader. Handles all types of material at a high rate.

Saves Time & Money

No other means of handling material on highway jobs is as fast or cheap as the Force-Feed Loader method. Eliminates taking large machinery from other jobs. A truck driver can quickly learn to operate the one-man Force-Feed Loader. Its end loading permits steady flow of traffic, avoids traffic tie-ups.

For Highway Departments & Road Contractors

Athey Force-Feeder Loaders are a "natural" for Highway Departments. State, county and township officials all over the country have recognized the importance of this machine in getting more out of tax dollars. Road Contractors, too, are finding the versatility and economy of this machine profitable on scores of jobs.

You, too, will find the Athey Force-Feed Loader one of your most useful, most economical and valuable tools. Ask your Athey-"Caterpillar" Dealer or write Athey Products Corporation, 5631 W. 65th St., Chicago, Illinois. Athey products are distributed by the world-wide "Caterpillar" sales organization.

Athey APCOR Products

Athey DEPENDABLE LOADING AND HAULING EQUIPMENT

(9)	50.00	55.00	13.00	19.00	72.95	108.90	63.00	45.00
(10)	8.00	9.50	9.00	16.00	2.65	40.00	7.60	30.00
(11)	40.00	21.50	30.00	18.00	21.00	50.00	40.00	45.00
(12)	$10,000	$9,430	$5,200	$12,500	$6,942	$14,000	$10,600	$5,000
(13)	$10,000	$9,035	$5,200	$11,000	$6,126	$14,000	$10,500	$5,000
(14)	35.00	35.00	65.00	20.00	25.00	30.00	65.00	75.00
(15)	400.00	325.00	440.00	450.00	280.00	350.00	550.00	500.00
(16)	350.00	300.00	273.00	300.00	243.00	300.00	415.00	450.00
(17)	10.00	6.00	10.00	10.00	12.30	16.00	43.00	5.00
(18)	10.00	7.50	20.00	50.00	20.00	15.00	45.00	10.00
(19)	12.00	8.50	80.00	50.00	12.30	28.00	50.00	12.00
(20)	75.00	25.00	60.00	100.00	37.00	50.00	110.00	40.00
(21)	20.00	12.00	65.00	125.00	26.00	30.00	54.00	30.00
(22)	35.00	15.00	100.00	150.00	14.80	30.00	51.00	25.00
(23)	75.00	50.00	70.00	40.00	62.00	60.00	85.00	40.00
(24)	75.00	100.00	80.00	60.00	93.00	100.00	85.00	55.00
(25)	.15	.12	.16	.11	.125	.15	.10	.20
(26)	5.00	7.00	50.00	4.00	4.90	6.00	8.00	5.00
(27)	20.00	16.00	13.00	2.50	3.70	50.00	6.00	10.00
(28)	100.00	45.00	70.00	45.00	37.00	50.00	66.00	15.00
(29)	10.00	25.00	10.00	20.00	12.50	50.00	20.00	5.00

Arizona—Maricopa County—City—Sewer Additions

Mark Cockrill Construction Co., Phoenix, submitted the apparent low acceptable bid to the City Clerk, Phoenix, at (Alternate 1) $261,369, (Alternate 2) $152,100, (Alternate 2) $137,254, with certain work to be done by the City for the construction of sanitary sewer additions in Phoenix. Under Alternate Proposal 1, the city was to furnish all pipe except 6-in., and under Alternate Proposal 2, all pipe was to be furnished by the contractor. Peter J. Foskin Co. submitted the low bid under Alternate Proposal 2, but the bid was received after time for opening. The unit bids follow:

	Alt. 1	Alt. 2	Alt. 2, with certain work to be done by the city
(A) Mark Cockrill Construction Co.	$261,269	$152,100	$137,254
(B) Vinson Construction Co. and Arizona Concrete Pipe Co. jointly	.....	166,713	154,688
(C) J. H. Welsh	.....	195,721	185,685
(D) Tiffany Construction Co.	.....	196,641	190,206
(E) Peter J. Foskin Co.	.....	148,872	143,672

(1) 43,000 cu. yd. excav.
(2) 1,300 sq. yd. pave. cut and replace., Type A.
(3) 65 sq. yd. pave. cut and replace., Type B.
(4) 5 sq. yd. pave. cut and replace., Type C.
(5) 180 sq. yd. pave. cut and replace., Type D.
(6) 10 sq. yd. pave. cut and replace., Type E.
(7) 140 sq. yd. asph. sidewalk, cut and replace.
(8) 5 lin. ft. curb and gutter cut and replace.
(9) 1,300 lin. ft. install 36-in. vit. clay pipe.
(10) 22,500 lin. ft. install 15-in. vit. clay pipe.
(11) 12,000 lin. ft. install 12-in. vit. clay pipe.
(12) 15,800 lin. ft. install 10-in. vit. clay pipe.
(13) 3,460 lin. ft. install 8-in. vit. clay pipe.
(14) 220 lin. ft. furn. and install 6-in. vit. clay pipe.
(15) 2,000 lin. ft. remove exist. 10-in. vit. clay pipe.
(16) 80 lin. ft. install and encase 15-in. vit. clay pipe (railroad crossings).
(17) 135 lin. ft. install and encase 12-in. vit. clay pipe (canal crossing).
(18) 124 ea. manholes.
(19) 1 ea. cutover manhole on 12th St. and Van Buren.
(20) 10 ea. manholes to be reconstructed.
(21) 1 ea. manhole No. 1, Line "A".
(22) 1 ea. manhole No. 1, Line "H".
(23) 36 ea. service change-overs.
(24) 5 ea. culvert headwalls.

	A (Alt. 1)	A (Alt. 2)	B (Alt. 2)	C (Alt. 2)	D (Alt. 2)	E (Alt. 2)
(1)	.99	.94	1.50	1.87	1.50	1.15
(2)	11.42	10.95	9.25	7.72	4.95	4.00
(3)	12.50	12.00	8.80	9.47	9.00	7.50
(4)	16.80	17.00	10.80	13.49	12.00	11.00
(5)	10.25	9.83	9.35	3.23	8.25	8.00
(6)	14.09	13.50	11.00	15.64	15.00	12.00
(7)	5.51	5.29	5.40	5.76	4.50	5.50
(8)	8.00	7.68	5.85	6.18	4.00	3.00
(9)	4.21	20.98	5.75	4.30	6.75	5.00
(10)	.80	3.25	1.15	1.35	1.50	1.10
(11)	.83	2.23	.80	1.08	1.45	1.05
(12)	.59	1.70	.60	.95	1.30	1.05
(13)	.84	1.61	.50	.75	1.00	1.00
(14)	3.00	2.85	1.75	1.58	1.60	1.50
(15)	1.53	1.47	.80	1.25	2.00	1.00
(16)	7.45	7.16	6.50	17.61	7.50	6.00
(17)	7.20	6.92	5.70	10.24	10.50	7.00
(18)	268.43	258.12	208.25	224.72	218.00	160.00
(19)	491.83	472.97	210.00	477.16	250.00	175.00
(20)	259.81	249.63	60.00	41.20	137.50	70.00
(21)	1179.51	1132.25	865.00	883.20	1100.00	900.00
(22)	708.85	681.52	240.00	333.56	375.00	250.00
(23)	35.88	34.48	42.00	16.74	50.00	40.00
(24)	97.23	93.50	60.00	55.00	110.00	75.00

Highway and Street . . .

California—San Mateo County—State—Grade & Pave

Guy F. Atkinson Co., South San Francisco, was awarded a $962,631 contract by the Division of Highways at Sacramento, for 2.1 mi. of highway to be graded and paved with Portland cement concrete, asphalt concrete and plant-mixed surfacing on crusher run base and a steel stringer highway overcrossing and reinforced concrete pedestrian overcrossing to be constructed, between the north city limits of South San Francisco and ½ mi. south of Colma Creek. The following unit bids were submitted:

(1) Guy F. Atkinson Co. $962,631
(2) Fredrickson & Watson 971,251
(3) Chas. L. Harney, Inc. 993,344
(4) Granite Construction Co. $1,076,522
(5) Morrison-Knudsen Co., Inc. 1,124,971

	(1)	(2)	(3)	(4)	(5)
1,478 cu. yd. removing conc.	3.50	3.00	5.25	3.00	2.00
Lump sum, clear and grub	$10,000	$17,000	$15,000	$20,000	$40,000
200,000 cu. yd. roadway excav.	.35	.333	.50	.50	.65
5,700 cu. yd. ditch and channel excav.	1.00	.77	1.40	.80	1.00
9,350 cu. yd. struct. excav.	2.80	2.35	3.00	3.50	4.00
300 cu. yd. struct. backfill	3.00	3.90	1.80	3.00	1.50
1,250,000 sta. yd. overhaul	.007	.008	.006	.008	.015
12,000 sq. yd. compact. orig. ground	.08	.07	.10	.06	.03
23,400 tons imp. backfill matl.	1.70	1.54	1.18	2.50	1.10
50,000 cu. yd. imp. base matl.	1.80	1.83	1.75	1.80	3.44
60,000 sq. yd. prep. landscape tr.	.10	.023	.06	.025	.04
10,500 cu. yd. imp. topsoil (prep. landscape tr.)	1.80	1.85	1.55	2.00	1.00
Lump sum, develop wat. sup. and furn. wat. equip.	$4,500	$2,100	$1,000	$9,000	$15,000
7,000 M. gal. apply water	2.25	1.35	2.10	2.00	1.50
111 sta. finish roadway	45.00	33.50	28.00	35.00	30.00

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32,000	tons	crusher run base	2.00	2.25	2.40	2.50	2.00
90	ton	liquid asph. SC-1	30.00	28.00	27.00	28.00	25.00
49	ton	asph. emulsion (pt. bdr. and sl. ct.)	30.00	29.00	28.00	35.00	25.00
330	ton	screenings	6.00	5.80	5.55	7.00	5.00
270	ton	liquid asph., SC-3 or SC-4	28.00	25.80	26.00	22.00	25.00
26,000	sq. yd.	prep., mix., and shap. surf.	.20	.14	.13	.20	.15
9	ton	liquid asph., SC-6 (armor coat.)	40.00	28.00	40.00	40.00	25.00
125	ton	screening (armor coat)	5.50	7.00	5.70	7.00	5.00
2,800	ton	P.M.S.	6.00	6.20	5.90	6.00	5.50
580	lin. ft.	raised bars (P.M.S. and asph. conc.)	1.50	1.30	1.25	1.00	1.00
7,300	ton	asph. conc. (level crse.)	6.50	6.10	5.65	6.50	6.00
3,800	ton	asph. conc. (Type "A" surf. crse.)	6.75	6.36	6.00	6.60	6.50
11,700	cu. yd.	Class "B" P.C.C. (pave.)	11.40	13.50	13.50	14.00	14.00
10,800	ea.	pave. tie bolt assemblies	.55	.49	.55	.60	.50
570	ton	rock fill matl. (struct.)	2.00	2.58	2.60	3.00	2.50
267	cu. yd.	Class "A" P.C.C. (footing blocks)	25.00	30.00	20.00	20.00	35.00
1,371	cu. yd.	Class "A" P.C.C. (struct.)	47.60	52.00	46.00	60.00	44.00
232,000	lb.	furn. bar reinf. steel	.06	.06	.072	.065	.065
232,000	lb.	pl. bar reinf. steel	.03	.023	.014	.025	.02
300,000	lbs.	furn. struct. steel	.10	.10	.12	.10	.11
300,000	lb.	erect. struct. steel	.03	.0515	.03	.04	.03
1,220	lin. ft.	furn. steel piling	4.00	2.66	2.75	2.70	2.00
48	ea.	driving steel piles	100.00	79.40	75.00	80.00	100.00
3,000	lb.	misc. iron and steel	.50	.46	.47	.50	.30
942	lin. ft.	steel handrail	4.20	3.94	2.75	3.50	3.50
418	lin. ft.	steel railing	8.00	7.47	7.40	10.00	6.50
1,600	lin. ft.	multiple duct conduit (overcr.)	2.00	1.62	3.35	.80	1.50
Lump sum,		lighting system (overcr.)	$3,500	$3,400	$5,100	$6,000	$2,800
236	lin. ft.	protective cage (ped. overcr.)	5.00	4.20	3.85	2.20	3.00
1,280	cu. yd.	Class "B" P.C.C. (Curbs and gutters)	35.00	29.50	36.00	35.00	35.00
500	ea.	curb dowels	.30	.17	.50	.10	.30
200	cu. yd.	Class "B" P.C.C. (sidewalks)	25.00	29.60	26.00	28.00	20.00
37	ea.	right-of-way monuments	5.00	5.80	5.00	6.00	5.00
7	ea.	center line monuments	25.00	16.50	20.00	24.00	16.00
5,400	lin. ft.	metal plate guard rail	2.50	2.54	3.00	2.30	2.50
2,600	lin. ft.	metal plate barrier rail	4.00	4.00	5.00	3.50	2.50
45	ea.	culvert markers	6.00	4.50	5.00	6.00	5.00
90	ea.	guide posts	6.00	5.47	5.00	6.00	5.00
1.5	mi.	woven wire property fence	$2,500	$2,300	$2,150	$2,000	$2,000
2	ea.	woven wire fence walk gates	50.00	66.30	31.00	25.00	200.00
9,100	lin. ft.	chain link fence	1.20	1.42	1.30	1.20	1.15
11	ea.	chain link fence walk gates	60.00	73.00	68.00	60.00	42.00
2,400	lin. ft.	12-in. std. str. R.C.P.	2.00	2.53	1.85	2.00	2.00
950	lin. ft.	18-in. std. str. R.C.P.	3.00	3.50	2.85	3.00	3.00
750	lin. ft.	24-in. std. str. R.C.P.	5.00	4.60	4.70	4.50	5.00
370	lin. ft.	30-in. std. str. R.C.P.	6.00	6.18	5.80	6.00	6.00
180	lin. ft.	36-in. std. str. R.C.P.	10.00	8.20	9.00	8.00	10.00
330	lin. ft.	8-in. 16-gauge C.M.P.	1.40	1.64	1.35	1.50	1.50
550	lin. ft.	12-in. 16-gauge C.M.P.	2.00	2.12	1.85	2.00	2.00
150	lin. ft.	18-in. 16-gauge C.M.P.	3.00	3.05	2.70	3.00	3.00
240	lin. ft.	24-in. 14-gauge C.M.P.	4.00	4.55	4.15	4.50	4.00
9	ea.	spillway aassemblies	35.00	36.50	30.00	28.00	30.00
16	ea.	Type 1 steel frames and grates	85.00	70.00	110.00	100.00	85.00
19	ea.	Type 2 steel frames and grates	100.00	90.00	100.00	120.00	100.00
4	ea.	remove and salvage frames and grates	50.00	23.00	18.00	28.00	15.00
7	ea.	manholes	250.00	350.00	290.00	200.00	300.00
2,600	lin. ft.	1½-in. electrical conduit (st. light system)	3.00	2.80	2.40	2.50	2.50
23	ea.	single light standards (st. light system)	500.00	500.00	320.00	330.00	450.00
1	ea.	double light standards (st. light system)	650.00	650.00	600.00	620.00	550.00
750	lin. ft.	¾-in. galv. steel pipe (supply line sprk. system)	.75	.70	.60	.75	.60
1,225	lin. ft.	1-in. galv. steel pipe (supply line sprk. system)	.90	.82	.70	.90	.70
765	lin. ft.	1¼-in. galv. steel pipe (supply line sprk. system)	1.00	.94	.80	.95	.80
200	lin. ft.	1½-in. galv. steel pipe (supply line sprk. system)	1.25	1.12	.95	1.10	.95
1,250	lin. ft.	2-in. galv. steel pipe (supply line sprk. system)	1.45	1.35	1.15	1.30	1.15
1,700	lin. ft.	2½-in. galv. steel pipe (supply line sprk. system)	2.25	2.12	1.80	2.10	1.80
500	lin. ft.	3-in. galv. steel pipe (supply line sprk. system)	2.45	2.30	1.95	2.10	1.95
550	lin. ft.	4-in. galv. steel pipe (supply line sprk. system)	2.80	2.65	2.25	2.60	2.25
7,000	lin. ft.	¾-in. galv. steel pipe (nozzle line sprk. system)	.60	.59	.50	.60	.50
5,550	lin. ft.	1-in. galv. steel pipe (nozzle line sprk. system)	.65	.59	.50	.60	.50
2,670	lin. ft.	1¼-in. galv. steel pipe (nozzle line sprk. system)	.75	.70	.60	.75	.60
15	ea.	¾-in. control assemblies (sprkl. system)	28.00	26.00	22.00	30.00	20.00
13	ea.	1-in. control assemblies (sprkl. system)	30.00	26.00	22.00	30.00	20.00
59	ea.	1¼-in. control assemblies (sprkl. system)	32.00	28.00	24.00	32.00	25.00
66	ea.	¾-in. quick coupling valves (sprkl. system)	12.00	10.60	9.00	11.00	9.00
2,200	lin. ft.	6-in. 16-gauge C.M.P. (pipe cond. sprk. system)	3.00	2.40	2.40	3.00	2.00
6.5	tons	commercial fertilizer (landscaping)	100.00	92.00	78.00	100.00	75.00
40	ton	straw mulch (landscaping)	50.00	47.00	40.00	50.00	40.00
45	ea.	No. 1 plants (landscaping)	2.80	2.65	2.25	2.60	2.25
132	ea.	No. 2 plants (landscaping)	4.00	3.76	3.20	3.50	2.20
172	ea.	No. 3 plants (landscaping)	1.25	1.12	.95	1.20	.95
235	ea.	No. 4 plants (landscaping)	1.20	1.06	.90	1.10	.90
235	ea.	No. 5 plants (landscaping)	1.25	1.12	.95	1.15	.95
41	ea.	No. 6 plants (landscaping)	1.30	1.23	1.05	1.20	1.00
184,000	ea.	No. 7 plants (landscaping)	.06	.053	.045	.05	.05
444	ea.	No. 8 plants (landscaping)	1.25	1.12	.95	1.10	.95
14,850	ea.	No. 9 plants (landscaping)	.04	.035	.03	.035	.03
1,475	ea.	No. 10 plants (landscaping)	.03	.02	.0175	.02	.02

Utah—Iron and Kane Counties—Public Roads Adm.—Grade and Surf.

A. O. Thorn & Sons Construction Co., Springville, submitted the low bid of $392,563 to the Public Roads Administration, Division No. 9, Denver, Colo., for 11.4 mi. of grade and paving of the Zion and Bryce Canyon National Parks Approach road. The road is to be 28 ft. wide. Unit bids are as follows:

(1) A. O. Thorn & Sons Construction Co. $392,563
(2) Reynolds Construction Co. 471,200
(3) V. C. Mendenhall $541,379
(4) L. T. Johnson Construction Co. 571,313
(5) Olof Nelson Construction Co. 636,108

				(1)	(2)	(3)	(4)	(5)
		Contingent sum, maintenance as authorized		300.00	300.00	300.00	300.00	300.00
		Contingent sum, miscellaneous force account work		600.00	600.00	600.00	600.00	600.00
60	ac.	clearing and grubbing		500.00	800.00	500.00	300.00	600.00
55	ea.	removal of trees, 6-in. size		5.00	10.00	10.00	7.50	5.00
26	ea.	removal of trees, 10-in. size		8.00	15.00	25.00	10.00	10.00
26	ea.	removal of trees, 18-in. size		12.00	20.00	50.00	15.00	20.00
8,270	cu. yd.	stripping and storing topsoil		.50	.40	1.00	.50	1.00
285,300	cu. yd.	unclass. excav.		.55	.70	.90	.90	1.10
962	cu. yd.	unclass. excav. for structures		2.00	2.00	2.00	2.50	3.00
51,000	cu. yd.	unclass. excav. for borrow		.35	.40	.80	.50	.50
1,282,300	sta. yd.	overhaul (1000 ft. free haul)		.02	.02	.02	.025	.02
120,500	cu. yd.	mi. spec. overhaul of borrow (1,000 ft. free haul)		.15	.15	.20	.25	.20
190,000	cu. yd.	extra compaction of embankment		.05	.05	.06	.05	.10
8,270	cu. yd.	replacing topsoil		.50	.75	1.50	.75	1.00
7,050	lin. ft.	furrow ditches		.10	.10	.35	.60	.15
657	units	obliteration of old roadways		5.00	2.00	4.00	2.50	15.00
3.01	mi.	fine grading roadway		$5,000	$5,000	700.00	$20,000	500.00

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4,750	M. gal. watering of embankment	1.00	2.00	1.50	1.50	2.00
870	M. gal. watering of base course	1.00	2.00	1.50	2.50	2.00
290	M. gal. watering of surface course	1.00	2.00	1.50	2.50	2.00
Lump sum,	providing and maintaining water supply	200.00	500.00	300.00	25.00	$1,000
2,300	cu. yd. selected borrow, base course	.70	.50	.90	.75	1.00
23,600	ton cr. gravel or stone base course, Class 3	1.00	1.00	1.00	1.35	1.50
7,700	ton cr. gravel or stone surf. course, Class 1	1.00	1.00	.72	1.50	1.60
2,130	ton blotter material for bitum. preservative treatment	3.00	3.00	3.50	2.00	5.00
279	ton medium-curing cut-back asph., Grade 1, for bitum. preservative treatment	36.00	40.00	31.00	30.00	32.00
230	ton medium-curing cut-back asph., Grade 4, for bitum. preservative treatment	36.00	40.00	34.00	35.00	35.00
171	cu. yd. conc., Class A (air-entrained, low-alkali cem.)	50.00	55.00	60.00	55.00	60.00
26,000	lbs. reinforcing steel	.10	.10	.12	.11	.15
6,500	lbs. struct. steel—furnished, fabricated and erected	.30	.25	.20	.14	.50
171	cu. yd. Class A stone masonry	20.00	60.00	50.00	35.00	50.00
48	lin. ft. 15-in. C.G.S.M.C. pipe (16 gauge)	2.50	2.25	2.46	2.25	2.75
250	lin. ft. 18-in. C.G.S.M.C. pipe (16 gauge)	1.40	2.50	1.26	2.50	3.20
2,432	lin. ft. 24-in. C.G.S.M.C. pipe (14 gauge)	3.80	3.90	4.10	3.80	4.75
240	lin. ft. 24-in. C.G.S.M.C. pipe (12 gauge)	4.75	5.30	5.05	4.00	6.20
20	lin. ft. 30-in. C.G.S.M.C. pipe (14 gauge)	5.20	5.50	4.85	4.50	6.20
212	lin. ft. 36-in. C.G.S.M.C. pipe (12 gauge)	7.30	8.00	7.27	6.50	9.50
186	lin. ft. 36-in. C.G.S.M.C. pipe (10 gauge)	8.50	9.30	8.52	6.75	10.80
110	lin. ft. 48-in. C.G.S.M.C. pipe (12 gauge)	6.00	5.00	6.00	10.00	12.25
30	cu. yd. loose riprap	5.00	20.00	5.00	10.00	10.00
180	ea. timber guide post with warning reflectors (treated)	6.00	9.00	8.00	6.00	10.00
4,720	cu. yd. furnishing and placing loamy topsoil	1.00	1.00	2.00	1.00	2.00
540	units bromus inermis seeding	5.00	2.00	10.00	5.00	20.00

New Mexico—Curry County—State—Grade and Surf.

Bowen & McLaughlin, Albuquerque, submitted the low bid of $524,625 for the construction of 8.754 mi. of bituminous pavement on U. S. Highway Route No. 60-70 between Clovis and Texico. The construction consists of grading, minor drainage structures, levelling course, watering and rolling, ballast, bituminous top course surfacing and sealing with asphalt and stone chips. Unit bids were as follows:

(1) Bowen & McLaughlin $524,625
(2) G. I. Martin 542,372
(3) Brown Construction Co. 583,118
(4) Allison & Haney $586,499
(5) Skousen Construction Co. 614,065
(6) Armstrong & Armstrong 648,361

		(1)	(2)	(3)	(4)	(5)	(6)
Lump sum,	clearing and grubbing	600.00	500.00	$2,000	350.00	$2,000	$1,000
Lump sum,	removal of old structures	$8,000	$2,000	$2,000	$6,500	$3,500	$5,000
Lump sum,	removal of obstructions	$3,000	500.00	$2,000	$2,000	$2,000	$1,500
268,820	cu. yd. excavation, unclassified	.22	.19	.21	.192	.25	.26
1,350	cu. yd. excavation for structures	2.00	2.00	2.00	2.50	2.00	1.75
7,825	cu. yd. excavation for pipe culverts	1.50	1.50	1.00	1.50	2.00	1.15
76,500	sta. cu. yd. overhaul	.02	.02	.02	.01	.03	.02
889,800	mi. cu. yd. haul	.05	.04	.05	.04	.05	.04
1,680	hr. mech. tamping	4.00	3.50	4.00	3.50	4.00	3.50
3,555	hr. rolling, sheepsfoot roller	3.80	4.00	3.50	4.00	3.50	3.50
3,070	hr. rolling, steel tired roller	3.80	4.50	3.00	4.75	4.50	4.50
230	hr. rolling, pneumatic tired roller	3.00	4.00	5.50	4.00	4.50	4.00
117,000	ton ballast	.67	.74	.84	.84	.88	1.15
68,800	ton leveling course	.71	1.10	1.09	1.14	1.13	1.29
7,785	lin. ft. concrete curb	1.90	1.80	1.50	1.25	1.50	1.70
12,060	M. gal. watering	1.50	1.75	2.00	1.20	2.00	1.25
38	cu. yd. concrete, Class "AE"	40.00	50.00	50.00	40.00	50.00	65.00
95	cu. yd. concrete sidewalks	30.00	40.00	30.00	40.00	50.00	35.00
1,760	lb. reinf. steel	.13	.12	.10	.12	.10	.15
318	lin. ft. corr. galv. metal culv. pipe, 12-in. diam.	2.00	2.00	1.75	2.25	2.00	2.10
756	lin. ft. corr. galv. metal culv. pipe, 18-in. diam.	3.00	2.50	3.00	3.10	2.50	2.70
2,668	lin. ft. corr. galv. metal culv. pipe, 24-in. diam.	4.10	3.60	4.00	4.30	3.80	4.00
324	lin. ft. corr. galv. metal culv. pipe, 30-in. diam.	5.50	4.50	4.50	5.40	4.50	4.90
450	lin. ft. corr. galv. metal culv. pipe, 36-in. diam.	8.00	6.80	7.00	7.90	7.00	7.30
1,158	lin. ft. corr. galv. metal culv. pipe, 42-in. diam.	9.00	7.80	8.00	9.10	8.00	9.00
796	lin. ft., corr. galv. metal culv. pipe, 48-in. diam.	11.00	8.50	9.50	10.10	9.50	10.40
1,472	lin. ft. corr. galv. metal culv. pipe, 54-in. diam.	13.00	10.50	11.00	12.00	11.00	12.25
460	lin. ft. corr. galv. metal culv. pipe, 60-in. diam.	17.00	17.00	14.00	15.00	15.00	16.50
1,014	lin. ft. relaying pipe	1.50	1.00	2.00	2.20	2.00	.90
160	lin. ft. corr. metal pipe arch culvert, 30-in. x 17-in.	5.00	3.95	5.00	5.00	6.00	4.60
2	ea. monuments and markers	50.00	50.00	50.00	50.00	50.00	50.00
38,410	lin. ft. galv. barbed wire fence	.14	.14	.15	.15	12.	.125
94	ea. bracing	5.00	4.00	2.00	3.30	4.00	4.00
6	ea. standard gates	50.00	40.00	30.00	40.00	50.00	35.00
207	ea. treated timber warning posts (reflect.)	8.00	8.00	8.00	8.00	9.00	8.00
46	ea. right-of-way markers	7.50	6.00	4.00	4.00	6.00	7.00
8.754	mi. salv. and repl. existing surf. course	190.00	700.00	$1,000	$1,000	600.00	700.00
51	ea. drop inlets Type "A"	180.00	100.00	200.00	200.00	150.00	150.00
5	ea. drop inlets Type "B" 3-ft. x 4-ft.	330.00	200.00	300.00	275.00	200.00	350.00
4	ea. drop inlets Type "B" 3-ft. x 5-ft.	340.00	300.00	400.00	300.00	250.00	360.00
1,800	bbl. cutback asphalt Type MC-1	5.00	5.40	5.80	5.70	5.50	5.90
8,840	bbl. cutback asphalt Type MC-3	4.65	5.30	5.80	5.70	5.25	5.80
1,910	bbl. 200-300 asphalt (for seal coat)	5.40	5.50	5.80	5.70	5.50	6.00
27,330	ton top course surf.	.78	1.10	1.09	1.23	1.13	1.29
264,860	sq. yd. mixing asphalt and aggregate	.03	.035	.04	.05	.05	.05
3,320	ton aggregate for seal coat	5.00	4.00	5.00	5.50	7.00	5.00
1	ea. metal grill for storm sewer outlet	60.00	100.00	200.00	75.00	100.00	200.00

Nevada—Elko County—State—Improve Roadway

Dodge Construction Co., Fallon, was awarded a $449,784 contract by the Department of Highways at Carson City, for the construction of a 10 mi. portion of the State Route No. 1, from Wells east, 250 working days being allowed for completion. Unit bids follow:

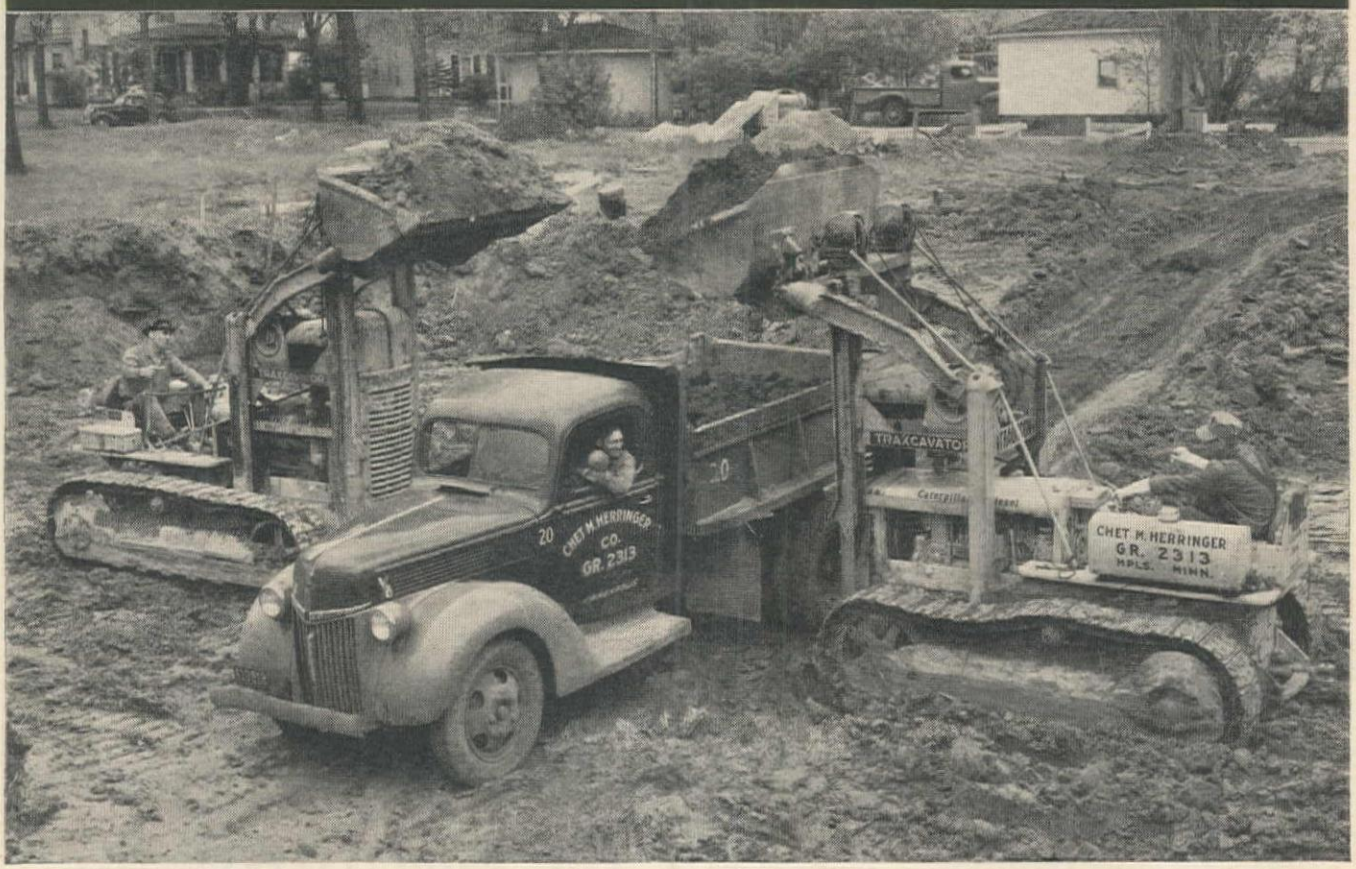
(A) Dodge Construction Co. $449,784
(B) Silver State Constructors 491,745
(C) Westbrook & Pope 499,071
(D) Gibbons & Reed, and J. C. Compton.. 503,569
(E) Isbell Construction Co. 516,708
(F) Whiting & Haymond $537,620
(G) Hoops Construction Co. 539,794
(H) Morrison-Knudsen Co. 544,375
(I) Parson & Fife, and L. T. Johnson.... *482,531

* Bid irregular.

(1) Force account, special detour
(2) Lump sum, signs
(3) 55 ac. clearing
(4) 334 lin. ft. remove culvert pipe
(5) 5 ea. remove headwalls
(6) 512,500 cu. yd. roadway excavation
(7) 854 cu. yd. drainage excavation
(8) 449 sta. V-type Ditches
(9) 247 sta. slope rounding
(10) 1,822,460 yd. sta. overhaul
(11) 93,734 yd. mi. overhaul
(12) 1,167 cu. yd. structure excav.
(13) 2,140 cu. yd. backfill
(14) Force account, roadside cleanup
(15) 24,137 M. gal. water
(16) 876 hr. power roller
(17) 28,501 ft. hr. tamping roller
(18) 125,437 ton Type 1 gravel base
(19) 75,326 ton Type 2 gravel base
(20) 397 ton liquid asphalt, Type MC-1
(21) 52 ton liquid asphalt, Type MC-2
(22) 140 ton liquid asphalt, Type SC-5
(23) 1,184 ton screenings
(24) 1,782 ton liquid asph., Type SC-3 or SC-4 (roadmix)
(25) 8.60 mi. roadmix (40-ft. width)

(Continued on next page)

DIG DIG DIG ON THE DOUBLE!



TWO TRAXCAVATORS AVERAGE 150 YARDS AN HOUR IN WET CLAY AND HARDPAN

Here's a case where Old Man Weather plotted against contractor Chet M. Herringer of Minneapolis. Unusually heavy rains and cold held up this 6000 yard excavation job until it was far behind schedule. But there was one thing Old Man Weather forgot — Chet Herringer's TRAXCAVATORS.

Chet put two of his one-yard Model IT4's on this job. Their direct-digging action, backed up with surefooted "Caterpillar" D4 tractor power, dug and loaded the wet, sticky clay and hardpan at a rate of 150 cubic yards an hour!

TRAXCAVATORS get work done! Put them to work digging, grading, excavating, loading and watch your hourly production climb. Their proven ability to do *more work* on *more jobs* on *more days* of the year means low-cost performance and greater profit for you.

TRAXCAVATORS are available in four sizes with bucket capacities from ½ to 4 cubic yards. See your TRACKSON-"Caterpillar" dealer for profit-making ways you can use one or more of these rugged versatile machines in your work or write TRACKSON COMPANY, Dept. WC-117, Milwaukee 1, Wis.

TRAXCAVATOR

REG. U. S. PAT. OFF.

The Original Tractor Excavator

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, etc., required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946, of Western Construction News, published monthly at San Francisco, California, for October 1, 1947.

State of California, County of San Francisco, ss. Before me, a Notary Public in and for the State and county aforesaid, personally appeared D. F. Forster, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the Western Construction News and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Arthur F. King, 503 Market St., San Francisco, Cal.

Editor—John M. Server, Jr., 503 Market St., San Francisco, Cal.

Business Manager—D. F. Forster, 503 Market St., San Francisco, Cal.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

KING PUBLICATIONS, 503 MARKET ST., SAN FRANCISCO, CAL.; Arthur F. King, 503 Market St., San Francisco, Cal.; Louise B. King, 503 Market St., San Francisco, Cal.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is: (This information is required from daily publications only.)

Donald F. Forster, Exec. V. P.
Business Manager

Sworn to and subscribed before me this 10th day of September, 1947.

(Seal) IRENE CRESPI,
Notary Public

(My commission expires Jan. 3, 1951.)

(26) 0.85 mi. roadmix (44-ft. width)
(27) 0.61 mi. roadmix (48-ft. width)
(28) 2,154 sq. yd. roadmix (city)
(29) 3,844 sq. yd. roadmix intersections
(30) 364 cu. yd. Class A concrete
(31) 35,670 lb. reinforcing steel
(32) 1,456 lin. ft. 24-in. corrugated metal pipe
(33) 354 lin. ft. 30-in. corrugated metal pipe
(34) 148 lin. ft. 36-in. corrugated metal pipe
(35) 138 lin. ft. 48-in. corrugated metal pipe
(36) 792 lin. ft. 29-in. x 18-in. corr. metal arch pipe
(37) 142 lin. ft. 36-in. x 22-in. corr. metal arch pipe
(38) 140 lin. ft. relay culvert pipe
(39) 21 cu. yd. Class A conc. curb and gutter
(40) 430 lb. structural steel
(41) 88 ea. culvert markers
(42) 25 ea. guide posts
(43) 72 ea. monuments
(44) 2,980 lin. ft. paved ditches
(45) 301 sq. yd. paved inlet ditches

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
(2)	850.00	$1,000	$2,250	500.00	$2,500	600.00	$1,000	$1,000	$1,200
(3)	35.00	50.00	200.00	55.00	140.00	75.00	50.00	35.00	100.00
(4)	1.50	1.00	1.20	1.10	1.00	1.00	1.00	1.00	1.50
(5)	10.00	10.00	12.00	15.00	15.00	15.00	15.00	20.00	10.00
(6)	.235	.27	.24	.255	.22	.21	.34	.28	.25
(7)	1.00	.50	1.20	.45	2.00	.70	1.00	1.00	.50
(8)	5.00	5.00	2.40	4.00	7.00	6.00	5.00	5.00	7.50
(9)	5.00	5.00	4.50	5.00	10.00	8.00	10.00	5.00	20.00
(10)	.01	.01	.01	.015	.015	.015	.01	.015	.015
(11)	.12	.20	.12	.12	.20	.15	.15	.15	.15
(12)	1.50	1.00	1.80	1.25	1.50	1.50	2.00	1.25	1.00
(13)	1.50	1.00	1.80	1.50	1.00	1.50	1.00	1.25	.50
(14)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
(15)	1.25	1.50	1.80	2.00	2.00	2.50	1.50	2.50	2.00
(16)	5.00	6.00	6.30	5.25	6.00	5.00	6.00	6.50	5.00
(17)	.50	.50	.53	.55	.50	.65	.80	.50	.50
(18)	.50	.45	.53	.58	.50	.70	.60	.60	.48
(19)	.90	.85	.96	.82	1.00	.80	.75	.90	.63
(20)	26.00	28.00	28.00	29.00	28.00	30.00	26.00	36.00	29.00
(21)	24.00	30.00	27.00	35.00	30.00	32.00	26.00	35.00	27.00
(22)	24.00	30.00	26.00	30.00	30.00	32.00	27.00	30.00	26.00
(23)	3.00	4.00	3.00	3.25	5.00	3.00	4.00	3.00	4.00
(24)	23.00	26.00	25.00	26.00	25.00	30.00	25.00	30.00	26.00
(25)	$1,000	$1,500	$1,200	$1,250	$1,600	$1,500	$1,000	$1,200	$1,000
(26)	$1,100	$1,500	$1,320	$1,400	$1,700	$1,750	$1,200	$1,300	$1,100
(27)	$1,200	$2,000	$1,400	$1,500	$1,900	$2,000	$1,400	$1,500	$1,200
(28)	.10	.10	.20	.10	.10	.30	.50	.15	.15
(29)	.10	.15	.20	.10	.10	.30	.30	.15	.15
(30)	40.00	50.00	50.00	41.00	60.00	70.00	50.00	36.00	45.00
(31)	.11	.12	.10	.11	.11	.11	.12	.12	.105
(32)	4.00	4.50	3.60	3.60	4.00	3.75	4.00	3.00	4.00
(33)	5.00	6.00	4.50	4.45	5.00	5.00	5.00	4.00	5.00
(34)	7.50	8.00	6.50	6.95	7.00	7.50	7.50	6.00	7.00
(35)	10.00	10.00	12.00	9.90	9.00	10.00	11.00	8.00	10.00
(36)	4.00	5.00	3.70	4.05	4.00	4.00	4.00	3.00	4.25
(37)	5.00	6.00	4.60	4.85	5.00	5.00	6 00	4.00	5.25
(38)	1.50	1.00	1.20	.50	2.00	1.50	2.00	1.00	2.00
(39)	40.00	60.00	50.00	50.00	60.00	80.00	70.00	36.00	50.00
(40)	.30	.20	.50	.25	.25	.30	.30	.25	.30
(41)	6.00	5.00	5.00	4.00	6.00	6.00	6.00	5.00	4.00
(42)	5.00	5.00	5.00	4.00	6.00	5.00	6.00	5.00	4.00
(43)	6.00	5.00	5.00	6.00	6.00	6.00	6.00	6.00	6.00
(44)	.25	.50	1.20	.50	.25	.40	1.00	.50	.80
(45)	.50	1.00	1.20	1.50	3.00	.50	3.00	.50	1.50

Cantilevers and Tubular Columns Make Possible Unusual Design

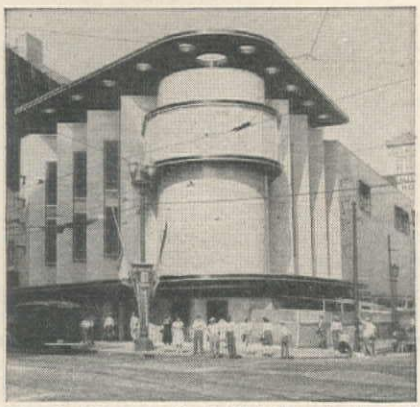


Fig. 1. The new Bond Building. Architect is Walker & Weeks, Cleveland.

By William B. Miller, C. E.
Cleveland, Ohio

THE architectural design of the new Bond Building (Fig. 1), erected on a downtown corner in Cleveland, makes use of cantilevers and some tubular columns. Arc welding was called upon frequently in fabricating the unusual structural forms.

A continuous, saw-tooth ground floor show window plan extends, unobstructed by any exterior columns, around both street sides, over which is a continuous marquee. The marquee and exterior portion of the 3-story building are supported by means of cantilevers from the main interior columns.

Fig. 2 is a sectional sketch of the cantilever construction over the show window. The 18″ x 20″ plates connecting the hanger and the wind bracing (labeled "A" in the sketch) were position welded in the fabricating shop, and the angle hangers were field welded to this plate with ⅜″ fillet welds after the marquee cantilevers were aligned. "Fleetweld 5" electrode was used for all welding on this job.

To give the marquee a slight upward slant (exaggerated in Fig. 2), the main marquee cantilever beams were bent in the shop by flame-cutting part-way through at point "B", bending, then welding the triangular gap, reinforcing the bottom flange with a welded splice plate. The top flange was not cut in order to facilitate fabrication.

As can be seen in Fig. 1, the corner of the building above the marquee line is rounded and extends over the main entrance. Tubular columns are used in this rounded corner to facilitate fabrication of beams framing radially and tangently into the columns. Fig. 3 is a portion of the corner bay on the third floor, showing radial cantilever beams which are shop-fabricated by coping out, bending and welding.

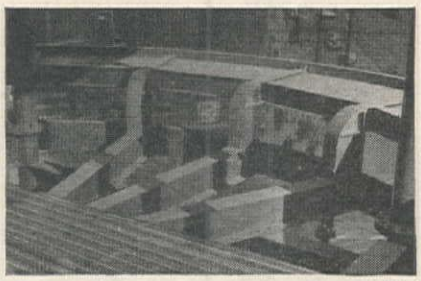


Fig. 3. Cantilever beams in corner bay at third floor level.

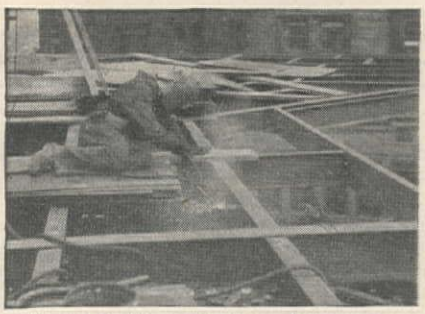


Fig. 4. Welding soffit plates of the canopy.

The clean-cut lines of the marquee and the decorative canopy over the top of the building were made possible by arc welded fabrication. The canopy frame is constructed entirely of steel using 10″ I beams of various weights to give a flush surface top and bottom. Top plates ¼″ thick and soffit plates 5/16″ thick were attached to this frame by welding. The soffit plates, erected first, were tightly clipped to the I beam flanges with stud-welded clips, then arc welded to the flange from above (Fig. 4).

After the soffit plates were completely welded, the deck plates were positioned, tack welded and continuously welded to the I beams, the weld metal filling in the ¼″ gap between plates and making a watertight job. The joints between the soffit plates were then welded continuously (Fig. 5). The welds were ground to a smooth flush surface. The open rings in the canopy were shop-fabricated by forming ⅜″ plate into a cylinder and fillet welding it to cut-out top and bottom plates.

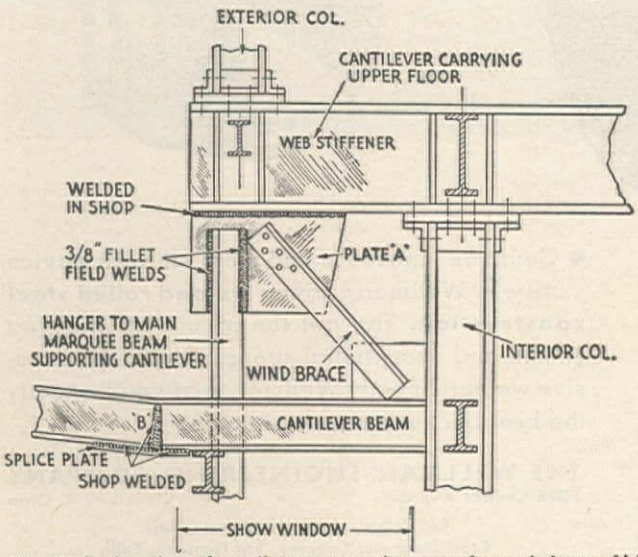


Fig. 2. Section view of cantilever construction over show windows which supports marquee and exterior columns for upper floors.

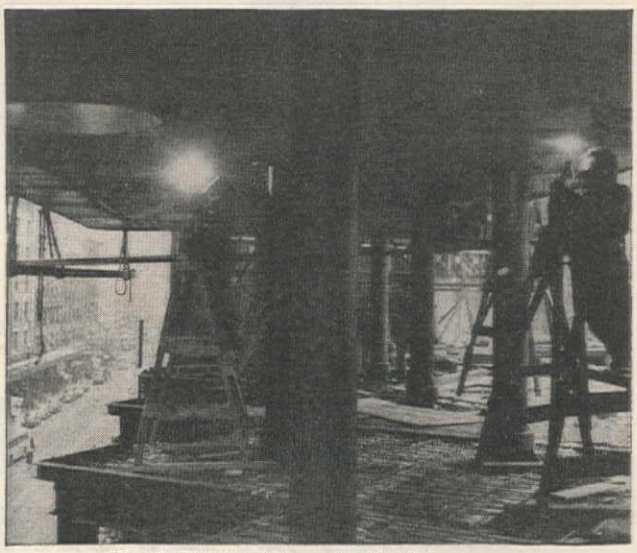


Fig. 5. Finish-welding underside of the canopy.

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CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than $75,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information: County of job location (capital letters); name and address of contractor (bold face); bid price; brief description of work; awarding agency; and approximate date of award. More detailed information may be secured concerning employment conditions, wage rates, etc., by writing directly to the contractor. When available, the names of the supervisory personnel will be published in the "Supervising the Jobs" columns.

CONTRACTS AWARDED

Large Western Projects . . .

Kuckenberg Construction Co., Portland, Ore., on a bid of $1,051,974, received the contract award from the Public Roads Administration, Portland, for work on 2.9 miles of the North Santiam hwy. between Detroit and Niagara, Ore. This is the fourth and final unit of a 10-mile section of new road needed to reach construction camp townsites to be used during the erection of the Detroit dam in Marion County, Oregon.

The J. C. Boespflug Construction Co., of Seattle, was awarded the general-construction contract in the amount of $1,731,932 for the construction of Units D, E, F, and G of the eight-unit Health Sciences Bldg. at the University of Washington, Seattle, Wash. Units E, F, and G will contain nonclinical functions of the University's new school. Estimated completion date for the units just placed under contract is January, 1949. The Boespflug Construction Co. holds the general contract to construct units A, B, and C of the medical buildings. Construction on these units is scheduled for completion in June, 1948. **University Plumbing & Heating Co.**, Seattle, was awarded the mechanical contract on a low bid of $837,670. The Board of Regents, University of Washington, awarded both contracts.

Coastwise Construction Co., of Palo Alto, Calif., will spend $6,000,000 for the construction of 400 wood frame and stucco, two to four bedroom dwellings on the 65-acre Willow Glen Subdivision site in San Jose, Calif. The owner and builder will award subcontracts.

McNutt Bros., Eugene, Ore., was awarded the $1,748,777 contract by the Corps of Engineers, Portland, Ore., for the relocation of the Lost Creek section of the Southern Pacific Railway Co. The work will include construction of an embankment, drainage structures, building a highway underpass, changing the Lost Creek channel and placing stone protection at the channel approach, and a portion of county road will be relocated also. The work is located near Dexter, Lane County, Ore.

Lease & Leighland, Seattle, Wash., were awarded a $2,190,025 contract for the construction of an administration bldg. at the Seattle-Tacoma Airport at Bow Lake, Wash. The **Navarre Plumbing & Heating Co.**, Seattle, received the $349,879 contract for mechanical work on the building, the electrical contract went to the **Agutter Electric Co.**, Seattle, for $215,772. The three contracts awarded by the Seattle Port Commission total $2,755,676.

Two contracts totaling $1,389,641 were awarded by the Board of Harbor Commissioners of Long Beach, Calif., for the construction of the transit shed, Berths 6 and 7, Pier A., Long Beach Harbor in Los Angeles County. **L. E. Dixon Co.**, San Gabriel, was given the $845,000 general contract and **Pacific Iron & Steel Co.**, Los Angeles, was awarded the $544,641 steel construction contract.

J. A. Terteling & Sons, Inc., of Boise, Idaho, has been awarded a contract by the Bureau of Reclamation at Indianola, Nebraska, for the construction of the Cambridge Diversion Dam, Cambridge sub-unit, Frenchman Cambridge Unit. The work is located approximately 2.5 mi. east of Cambridge in Furnas County, Nebraska. The contract price is $367,683.

SERVING THROUGH SCIENCE

EXTRA SHOCK PADS

protect this husky trio from costly impact injuries!

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

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

U. S. ROYAL *LOGGER*

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

U. S. ROYAL *Fleet Delivery*

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

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

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

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

U.S. ROYAL TIRES

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

UNITED STATES RUBBER COMPANY

1230 Avenue of the Americas • Rockefeller Center • New York 20, N. Y.

Milton Kaufmann, Inc., Gardena, Calif., is owner and builder of a $1,632,870 private housing project including 248 four-room, frame and stucco homes to be built on Graystone, Dalwood, Fairford, Lugett and Elmcroft Sts., in the Norwalk District of Los Angeles, Calif.

Lindgren & Swinerton, Los Angeles, Calif., will build ten 12-unit frame and stucco apartment buildings and 99 frame and stucco dwellings at Western Acres in El Centro, Calif. El Centro Properties, Inc., awarded the $2,000,000 contract.

Hydraulic Dredging Co., Ltd., Oakland, Calif., has been given a $824,735 contract to build up a 3.1 mile section of the new water level Columbia River Highway. This link, together with work now under way by the state highway department, will complete roughing out the new road from Troutdale to Dodson, Oregon. The contract was awarded by the Public Roads Administration in Portland, Ore.

Fred J. Early, Jr. Co., San Francisco, Calif., was awarded a contract on its bid of $427,195 to the San Leandro City Council for the construction of additions and for improvements to the sewage treatment plant at San Leandro, Alameda County, Calif.

L. H. Hoffman of Portland, Ore., has been awarded a $1,000,000 contract by the Continental Can Company of New York for the erection of a can making factory. The reinforced concrete plant containing 240,000 sq. ft. of floor space under one roof will be located on a 55-acre site in the industrial area of Portland, Ore. Construction is expected to start immediately and the plant should be completed in time for the 1948 canning season.

Earl W. Heple, San Jose, Calif., submitted the low bid of $1,373,-652 before the Division of Highways at Sacramento, and was awarded the contract for 7.7 miles of clearing, grubbing, grading and for the construction of steel and reinforced concrete freeway structures in Santa Cruz, Calif.

Highway and Street . . .

Arizona

MARICOPA CO.—**Wallace & Wallace,** Box 470, Phoenix—$82,538 for 4 mi. grade, drain and surf. 16th St. from Baseline

Rd. southeast of Phoenix to Henshaw Rd. —by State Highway Department, Phoenix. 10-21

California

SAN BERNARDINO CO. — **Morrison-Knudsen Co.,** Box 70, South Gate—$872,967 to grade and surf. 5.7 mi. betw. Los Angeles County line and 0.6 mi. east of Ontario—by Division of Highways, Sacramento. 10-17

SAN BERNARDINO CO.—**Westbrook & Pope,** Rt. 9, Box 841, Sacramento—$743,959 for approx. 4.3 mi. grade and surf. and bridge constr., betw. City Creek Bridge and slightly east of Plunge Creek—by Division of Highways, Sacramento. 10-3

SUTTER CO.—**McGillivray Construction Co.,** Box 873, Sacramento—$158,474 for 1.7 mi. grade, surf. and seal coat, Live Oak—by Division of Highways, Sacramento. 10-10

TULARE & FRESNO COS.—**N. M. Ball Sons,** 685 Delaware St., Berkeley—$593,491 for 5.2 mi. grade and surf. betw. 0.5 mi. south of Kingsburg and Selma—by Division of Highways, Sacramento. 10-21

Colorado

LARIMER CO.—**Horner & Switzer,** 118 S. Pecos St., Denver—$245,147 for 4.3 mi. gravel surf. of State Hwy. No. 16, betw. Estes Park and Trail Ridge — by State Highway Department, Denver. 10-10

PROWERS CO.—**Blanchard Bros.,** Tramway Bldg., Denver—$190,846 for 10.3 mi. grade and surf. on State Hwy. No. 59, work located south of Lamar—by State Highway Department, Denver. 10-1

YUMA AND PHILLIPS COS.—**J. H. & N. M. Monaghan & Assos.,** Rt. 1, Derby—$186,906 for 14.7 mi. oiling betw. Holyoke and Wray on State Hwy. No. 51—by State Highway Department, Denver. 10-2

New Mexico

SANDOVAL CO. — **G. I. Martin Construction Co.,** 520 S. Tulane St., Albuquerque—$196,610 for 14.8 mi. grade, drain and base on State Hwy. No. 4 betw. Jemez Springs and San Ysidro—by State Highway Department, Santa Fe. 10-14

VALENCIA & SOCORRO COS.—**G. I. Martin Construction Co.,** 520 S. Tulane St., Albuquerque—$105,055 for 18.9 mi. grade, drain structs., and base on State Hwy. No. 6, betw. Belen and Scholle—by State Highway Department, Santa Fe. 10-14

North Dakota

McKENZIE CO. — **Rolfson Construction Co.,** Bismarck—$105,892 for 9.8 mi. grade and surf. of State Hwy. No. 23, west of Sanish—by State Highway Department, Bismarck. 10-1

WARD AND McHENRY COS.—**Northern Improvement Co.,** Fargo—$621,359 for 32.7 mi. base, asph. conc. surface and incidentals on U. S. Hwy. No. 52 and State Hwy. No. 14, from east of Sawyer to Drake—by State Highway Department, Bismarck. 10-1

Oregon

CLARK CO.—**J. N. & M. J. Conley,** 4332 N.E. Royal Court, Portland—$82,822 for 1.6 mi. of timber access rd. north of Vancouver—by Public Roads Administration, Portland. 10-9

DOUGLAS CO. — **Denton Construction Co.,** Portland—$98,308 for 0.7 mi. of grade and bitum. macadam widening, Gardiner section of Oregon Coast Hwy.—by State Highway Commission, Salem. 10-22

DOUGLAS CO.—**Leonard & Slate Oregon, Ltd.,** 7805 S.W. 40th Ave., Portland—$298,882 for 4.3 mi. grade and pave of Roseburg-Dixonville section of North Umpqua County Road—by State Highway Commission, Salem. 10-21

DOUGLAS CO.—**Leonard & Slate Oregon, Ltd.,** 7805 S.W. 40th Ave., Portland—$208,898 for 4.1 mi. improvement and grade of S. Umpqua rd., Umpqua Natl. Forest—by Public Roads Administration, Portland. 10-9

HARNEY CO.—**Intercity Sand & Gravel Co.,** Eugene—$164,840 for 7.9 mi. grade and oil mat surf.; also stockpiling, Crane-Princeton section of Diamond Valley Secondary Hwy.—by State Highway Commission, Salem. 10-22

MARION CO.—**Kuckenberg Construction Co.,** Box 949, Rt. 7, Portland—$1,051,974 for 2.9 mi. hwy. constr. betw. Detroit and Niagara—by Public Roads Administration, Portland. 10-9

MULTNOMAH CO.—**Hydraulic Dredging Co., Ltd.,** Central Bank Bldg., Oakland, Calif.—$824,734 for 3.1 mi. hydraulic embankment work on Ore. forest hwy. project 28-D, unit 1, Columbia River Hwy. in Mt. Hood Natl. Forest—by Public Roads Administration, Portland. 10-9

Utah

SANPETE CO.—**Germer & Abbott,** Tremonton—$102,170 for 8.2 mi. grade and road mix bitum. surf. of Hwy. No. 91, betw. Fairview and Milburn—by State Road Commission, Salt Lake City. 10-6

Washington

DOUGLAS CO.—**Roy L. Bair & Co.,** W. 1220 Ide Ave., Spokane—$329,851 for 12.5 mi. clear, grub, grade, ballast, surf. and stockpiling of Secondary State Hwy. No. 10-B, betw. Lehay and Grand Coulee Dam—by Department of Highways, Olympia. 10-8

KING CO.—**Fiorito Bros., Inc.,** 1100 Leary Way, Seattle—$141,170 to pave W. 57th St., Seattle—by City Council, Seattle. 10-17

KLICKITAT CO.—**C. E. ONeal Co., Inc.,** Box 268, Ellensburg—$437,614 for 4 mi. grade, ballast and surf. of Primary State Hwy. No. 8, betw. Maryhill and Columbia summit—by Department of Highways, Olympia. 10-8

Canada

BRITISH COLUMBIA — **Storms Contracting Co., Ltd.,** Toronto — $129,867 for reconstr. of Winfield-Posthill section of Okanagan Hwy.—by Public Works Department, Victoria. 10-3

Bridge & Grade Separation...

Arizona

GREENLEE CO.—**Vinson Construction Co.,** Box 930, Phoenix —$354,980 for steel bridge and approaches on Clifton Hwy. over Gila River—by State Highway Department, Phoenix. 10-17

California

ALAMEDA CO.—**Carl N. Swenson Co.,** 1095 Stockton Ave., San Jose—$354,098 for overcrossing and south approach, over East Shore Hwy. and tracks of Southern Pacific Co. and Western Pacific Railroad Co., Oakland—by Division of Highways, Sacramento. 10-24

LOS ANGELES CO.—**Guy F. Atkinson Co.,** 22233 S. Santa Fe Ave., Long Beach—$346,068 for reinf. conc. girder undercrossing on Hollywood Parkway at Alvarado St., Los Angeles—by Division of Highways, Sacramento. 10-23

LOS ANGELES CO.—**James I. Barnes Construction Co.,** 1119 Montana Ave., Santa Monica—$357,466 for reinf. conc. undercrossing and retaining walls, Harbor Parkway at Temple St., Los Angeles—by Division of Highways, Sacramento. 10-17

SANTA BARBARA CO.—**C. B. Tuttle Co.,** 268 Belmont Ave., Long Beach—$526,034 for two steel girder bridges across Nojoqui Creek and Santa Inez River near Buelton—by Division of Highways, Sacramento. 10-10

SANTA CRUZ CO.—**Earl W. Heple,** 494 Delmas Ave., San Jose—$1,373,652 for 7.7 mi. clear, grub, grade and steel and reinf. conc. freeway structs., betw. Rob Roy Junction and Morrissey Ave., Santa Cruz—by Division of Highways, Sacramento. 10-21

SHASTA CO.—**Fredrickson Bros.,** 1259 65th St., Emeryville—$625,426 for struct. steel girder bridge with reinf. conc. deck and 1.5 mi. grade and surf. betw. junction of Rt. 3 in Redding and 1.5 mi. east—by Division of Highways, Sacramento. 10-9

TEHAMA CO.—**G. M. Carr & Bati Rocca,** 2333 Burbank Ave., Santa Rosa—$174,743 for two steel beam span bridges and grade and surf. of approaches, across Thomas Creek and Reeds Creek, south of Red Bluff—by Division of Highways, Sacramento. 10-10

New Mexico

SAN JUAN CO.—**Skousen Construction Co.,** Springer Bldg., Albuquerque—$146,956 for superstruct. and 1.5 mi. grade and surf. of State Hwy. No. 55, south of Aztec—by State Highway Department, Santa Fe. 10-14

Washington

LEWIS CO.—**Anderson Bridge Construction Co.,** Tacoma—$286,091 for steel truss bridge and steel girder approaches, Cora Bridge on Primary State Hwy. No. 5—by Department of Highways, Olympia. 10-3

Wyoming

HOT SPRINGS CO.—**American Bridge Co.,** Denver, Colo.—$528,785 for bridge superstructs., relocation of Chicago, Burlington & Quincy Railroad, near Thermopolis—by Bureau of Reclamation, Thermopolis. 10-13

Water Supply . . .

California

CALAVERAS CO.—**Ferguson Bros.,** 10524 Graffian St., Oakland—$81,395 for water supply pipe line, filter plant, distribution system, and sewage disposal plant at Fricot Ranch School for Boys, east of San Andreas—by Division of Architecture, Sacramento. 10-24

IMPERIAL CO.—**C. M. Elliott,** 5333 E. Palisades Rd., San Diego—$442,574 for steam station and pump station substructs. and water storage and supply facilities, City Steam Station, El Centro—by Imperial Irrigation District, El Centro. 10-3

Washington

GRANT CO.—**Pacific Bridge Co.,** 333 Kearny St., San Francisco, Calif.—$53,500 for two reinf. conc. storage reservoirs and one booster pump plant, Grand Coulee—by City Council, Grand Coulee. 10-16

GRAYS HARBOR CO.—**Stateside Construction Co.,** Seattle—$325,000, approx., for water supply system at Westport—by City Council, Westport. 10-1

Sewerage . . .

Arizona

MARICOPA CO.—**Peter J. Fosking Co.,** 1606 E. Indian School Rd., Phoenix—$148,872 for sanitary sewer additions, Phoenix—by City Council, Phoenix. 10-10

PIMA CO.—**M. M. Sundt Construction Co.,** 440 S. Park Ave., Tucson—$97,657 to install sewers in Tucson—by City Council, Tucson. 10-17

California

ALAMEDA CO.—**Associated Engineers,** 3606 El Camino Real, Palo Alto—$50,744 for sewers, manholes and lampholes near Centerville—by Union Sanitary District, Centerville. 10-10

ALAMEDA CO.—**Fred J. Early, Jr. Co.,** 369 Pine St., San Francisco—$427,195 to add to and improve sewage treatment plant, San Leandro—by City Council, San Leandro. 10-22

ALAMEDA CO.—**Oakland Sewer Construction Co.,** 9915 Walnut St., Oakland—$143,018 for installation of sewer lines in Hayward Acres, west of Hayward—by Ora Loma Sanitary Sewer District, Hayward. 10-16

LOS ANGELES CO.—**Artukovich Bros.,** 7320 Atlantic Ave., Hynes—$114,874 to lay approx. 10,000 ft. sewer line from Garvey Ave. to Lower Azusa Rd., Los Angeles—by County Sanitation District No. 2, Los Angeles. 10-10

LOS ANGELES CO.—**Burch & Bebek,** 2803 Los Flores Blvd., Lynwood—$103,725 for joint outfall "B" Unit 5, from junction with Unit 4 to Sunset Blvd. and Huntington Dr., Arcadia—by Sanitation District No. 2, Los Angeles. 10-17

LOS ANGELES CO.—**I. C. Construction Co.,** 1033 Arden Dr., Temple City—$166,442 to install sewers, Fulton Ave. and Addison St., Sewer District, Los Angeles—by City Council, Los Angeles. 10-10

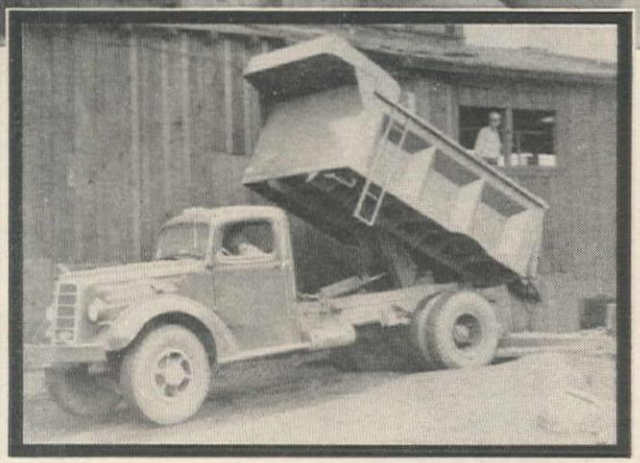
LOS ANGELES CO.—**Martin Construction Co., Inc.,** 1529 Olympic Blvd., Montebello—$78,929 to install sanitary sewers and appurtenances in Ramona Blvd., Los Angeles—by City Council, Los Angeles. 10-10

LOS ANGELES CO.—**Steve P. Rados,** 2975 San Fernando Rd., Los Angeles—$164,917 for sections 1-A and 1-B of Arcadia-Sierra Madre trunk sewer line—by Sanitation District No. 15, Los Angeles. 10-17

LOS ANGELES CO.—**V. C. K. Construction Co.,** 629 S. Atlantic Blvd., Los Angeles—$295,343 to install sanitary sewers in

STRIP-EASE!

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



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

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

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Twin Falls Equipment Co.
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Western Construction Equipment Co.
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HERCULES DUMP BODIES *and* HYDRAULIC HOISTS

HERCULES STEEL PRODUCTS CORPORATION...GALION, OHIO

Chandler Blvd. and Woodman Ave., Los Angeles—by City Council, Los Angeles. 10-3

LOS ANGELES CO.—**R. A. Watson Co.,** 5528 Vineland Ave., North Hollywood—$411,702 to install sewers in Forman Ave. and Camarillo St. Sewer District, Los Angeles—by City Council, Los Angeles. 10-24

LOS ANGELES CO.—**R. A. Watson Co.,** 5528 Vineland Ave., North Hollywood—$61,145 for section 1-C of Arcadia-Sierra Madre trunk sewer—by Sanitation District No. 15, Los Angeles. 10-17

SAN JOAQUIN CO.—**Fred J. Early, Jr. Co.,** 369 Pine St., San Francisco—$197,860 for sewage pump station and alterations to existing bldg. and facilities, Stockton—by City Council, Stockton. 10-16

VENTURA CO.—**Green-Mears Construction Co.,** 3412 Ben Lomond Dr., Los Angeles—$139,860 to install sewer lines, manholes, etc., for storm sewers in Santa Paula—by City Council, Santa Paula. 10-17

Washington

PIERCE CO.—**Woodworth & Co., Inc.,** 1200 E. D St., Tacoma—$76,201 to install sewers in area bounded by Tyler, Orchard, N. 9th and N. 12th Sts., Tacoma—by City Council, Tacoma. 10-8

Waterway . . .

California

LOS ANGELES CO.—**S. Edmondson & Son,** 7711 S. Alameda St., Los Angeles—$108,032 for flood control channel on Wilbur Creek, from Devonshire St. to east and west branches of Wilbur Creek above San Fernando Mission Blvd., Los Angeles—by Department of Agriculture, San Fernando. 10-17

LOS ANGELES CO.—**Standard Dredging Corp.,** Central Bldg., Los Angeles—$198,700 for emergency dredging and beach restoration at Surfside—by Corps of Engineers, Los Angeles. 10-1

Montana

ROSEBUD CO.—**H. & R. Construction Co., Inc.,** Great Falls—$203,323 for compacted earth fill levee and attendant works for Forsyth, Montana Flood Control project—by Corps of Engineers, Fort Peck. 10-17

Oregon

LANE CO.—**Morrison-Knudsen Co., Inc.,** Box 450, Boise, Idaho—$112,940 for core trench, drainage ditches and pipe culverts near left abutment of Lookout Point dam—by Corps of Engineers, Portland. 10-2

Canada

BRITISH COLUMBIA—**Horie Latimer Construction Co., Ltd.,** 510 W. Hastings St., Vancouver—$144,622 to replace wharf at Bella Coola—by District Engineer, New Westminster. 10-3

Dam . . .

Nebraska

FURNAS CO.—**J. A. Terteling & Sons, Inc.,** Box 1428, Boise, Ida.—$367,683 for Cambridge Diversion Dam, Frenchman-Cambridge Unit, approx. 2.5 mi. east of Cambridge—by Bureau of Reclamation, Indianola. 10-21

Irrigation . . .

Oklahoma

JACKSON CO. — **Stamey Construction Co.,** 10 West 21st St., Hutchinson, Kan.—$430,165 for earthwork and structs., Altus laterals 21, 5 and 21.7 and sublaterals, W. C. Austin project—by Bureau of Reclamation, Denver, Colo. 10-10

Wyoming

PARK CO. — **Knowlton & Jensen,** Salt Lake City, Utah—$354,978 for earthwork and structs., Ralston lateral, station 231 + 25.02 to station 413 + 69.25, laterals, sublaterals and north alkali drain, Heart Mountain division, near Ralston—by Bureau of Reclamation, Cody. 10-10

Power . . .

California

LOS ANGELES CO. — **H. H. Walker, Inc., & Stetson Electric Co.,** 1816 S. Grand Ave., Los Angeles—$121,313 for 69-kv. and 220 kv. transmission lines near Mesa substation— by Southern California Edison Co., Los Angeles. 10-10

Building . . .

Arizona

MARICOPA CO. — **Louis Karpe,** Rt. 8, Box 615, Phoenix — $123,266 for school bldg. additions, High School, Mesa — by County Commission, Mesa. 10-22

California

ALAMEDA CO. — **Cahill Construction Co.,** 206 Sansome St., San Francisco — $225,000 for reinf. conc. and struct. steel can manufacturing plant, 129th Ave., San Leandro—by Pacific Can Co., San Francisco. 10-23

ALAMEDA CO.—**Robert L. Wilson,** 427 Bryant St., San Francisco — $180,795 for ward bldgs. and elevator, Fairmont Hospital, San Leandro—by County Commission, Oakland. 10-13

ALAMEDA CO.—**Robert L. Wilson,** 427 Bryant St., San Francisco—$126,927 constr. of additions to courthouse, 1225 Fallon St., Oakland — by County Commission, Oakland. 10-13

FRESNO CO. — **Taylor-Wheeler Commercial, Inc.,** 420 Safford Ave., Fresno—$119,405 for wood frame, conc., stucco exterior gymnasium, Parlier—by City School District, Parlier. 10-10

IMPERIAL CO.—**Lindgren & Swinerton,** 605 W. Olympic Blvd., Los Angeles — $2,000,000 for ten 12-unit apartment bldgs. and 99 dwellings of frame and stucco constr. at Western Acres, El Centro—by El Centro Properties, Inc., El Centro. 10-17

KINGS CO. — **Taylor-Wheeler Commercial, Inc.,** 420 Safford Ave., Fresno—$102,800 for school bldg., Avenal—by Reef-Sunset Union Elementary School District, Avenal. 10-24

LOS ANGELES CO.—**Baruch Corp.,** 5655 Wilshire Blvd., Los Angeles—$357,000 for frame and stucco elementary school bldgs.

at 2615 E. Huntington Dr. and 1700 Huntington Dr., San Marino—by City School District, San Marino. 10-3

LOS ANGELES CO.—**Bethel Corp.,** 3780 Wilshire Blvd., Los Angeles—$350,000 for factory bldg., conc. foundation, wood frame, East Los Angeles—by Pacific Can Co., San Francisco. 10-13

LOS ANGELES CO.—**Beyer & Abrahamson,** 319 9th, Los Angeles—$150,000 for steel frame, one-story telephone exchange bldg. addition, 490 Foothill Rd., Beverly Hills—by Pacific Telephone & Telegraph Co., Los Angeles. 10-3

LOS ANGELES CO.—**R. J. Blanco,** 5177 Overland Ave., Culver City—$250,000 for 33 six-room frame and stucco dwellings in Van Nuys—by Manhattan Beach Building Co., Culver City. 10-10

LOS ANGELES CO. — **Chalon Corp.,** 10399 Sunset Blvd., West Los Angeles—$267,000 for three, frame and stucco 18-room and two 72-room apartment bldgs. on Corbett St., Los Angeles—by self. 10-10

LOS ANGELES CO.—**Le Roy Craven,** 146 West Linden Ave., Burbank—$202,600 for 20 eight-room frame and stucco double dwellings in San Pedro — by Harbor Homes, Los Angeles. 10-10

LOS ANGELES CO.—**R. J. Daum,** 6803 West Blvd., Inglewood—$240,000 for reinf. conc., one-story and basement central office telephone bldg., 9420 Long Beach Blvd., Southgate—by Pacific Telephone & Telegraph Co., Los Angeles. 10-8

LOS ANGELES CO.—**L. E. Dixon Co.,** 409 S. California St., San Gabriel—$845,000 general contract for transit shed, Berths 6 and 7, Pier A, Long Beach Harbor—by Harbor Commission, Long Beach. 10-8

LOS ANGELES CO.—**Ray Gerhart,** 334 S. Greenwood Ave., Pasadena — $300,000 for conc. club bldg. on 5-acre site, Euclid Ave. and Villa St., Pasadena—by Boys' Club Directors, Pasadena. 10-13

LOS ANGELES CO.—**Jones-Hettelsater Construction Co.,** Ferguson and Atlantic Blvd., Los Angeles—$300,000 for conc. and steel malt house bldg., 5945 Malt Ave., Bell Gardens—by Miller Malting Co., Los Angeles. 10-17

LOS ANGELES CO.—**Milton Kaufmann, Inc.,** 2918 West Compton St., Gardena—$1,632,870 for 248 frame and stucco dwellings in Norwalk District, Los Angeles—by self. 10-10

LOS ANGELES CO.—**Kemp Bros.,** 8750 Mettler St., Los Angeles — $209,570 for one-story, frame and stucco bldg. at Hadley St. and Milton Ave., Whittier — by Young Men's Christian Assn., Whittier. 10-17

LOS ANGELES CO.—**E. C. Nesser, Johnson & Vedder,** 4822 W. Jefferson St., Los Angeles—$534,000 for frame and stucco junior high school bldgs., Oak and Mariposa Sts., Burbank—by City Unified School District, Burbank. 10-10

LOS ANGELES CO. — **Opper & Forsberg,** 1446 West 180th St., Gardena—$126,893 for frame and stucco, 10-classroom elementary school bldg., 1112 W. F St., Wilmington—by Board of Education, Los Angeles. 10-10

LOS ANGELES CO. — **Pacific Iron & Steel Co.,** 11633 S. Alameda St., Los Angeles—$544,641 for steel work on transit shed, Berths 6 and 7, Pier A, Long Beach Harbor — by Harbor Commission, Long Beach. 10-8

LOS ANGELES CO.—**Sapp Construction Co., Inc.,** 460 N. Rexford Dr., Beverly Hills—$527,740, general contract for reinf. conc. and steel, one-story fair bldg., Fair Grounds, Pomona—by County Board of Supervisors, Los Angeles. 10-6

LOS ANGELES CO.—**Steed Bros.,** Box 350, Alhambra—$127,500 for reinf. conc. church bldg., Huntington Dr., San Marino—by Pastor, Sts. Felicitas and Perpetua Parish, San Marino. 10-10

LOS ANGELES CO. — **The Austin Co.,** 777 E. Washington Blvd., Los Angeles—$280,000 for reinf. conc. film vault bldg. addition at 6311 Romaine St., Los Angeles—by Technicolor Motion Picture Corp., Los Angeles. 10-17

SAN FRANCISCO CO. — **Cahill Bros., Inc.,** 206 Sansome St., San Francisco—will build a 5-story, reinf. conc. substation at Mission and Eighth Sts., San Francisco—by Pacific Gas & Electric Co., San Francisco. 10-27

SAN MATEO CO.—**Arthur Bros.,** 941 S. Claremont, San Mateo—$519,000 for reinf. conc., two-story county relief home addition, San Mateo—by County Commission, Redwood City. 10-8

SAN MATEO CO.—**Joseph Barnes,** 752 Folsom St., San Francisco—$800,000 for one-story, reinf. conc. lithographing plant, 10-acre site on San Mateo Dr., San Bruno—by H. S. Crocker Co., Inc., San Francisco. 10-16

SANTA CLARA CO. — **Coastwise Construction Co.,** 2449 Middlefield Rd., Palo Alto—$6,000,000 for 400 stucco and frame dwellings on 65-acre site, Willow Glen Subdivision, San Jose—by self. 10-1

SANTA CLARA CO.—**M. C. Ingraham,** 451 Santa Margarita Ave., Palo Alto—$250,000 for wood frame, two-story apartment bldgs., four in number, at Manhattan and Woodland Aves., Palo Alto—by Manhattan Ave. Corp., Palo Alto. 10-1

STANISLAUS CO.—**MacDonald, Young & Nelson,** 351 California St., San Francisco—$225,000 for reinf. conc. and steel, four-story and basement telephone exchange bldg. addition, 1012 11th St., Modesto—by Pacific Telephone & Telegraph Co., San Francisco. 10-24

YUBA CO.—**W. R. Burrough,** 911 5th St., Marysville—$100,000 for frame and stucco, 23-bed hospital addition, Marysville — by Board of Directors, Rideout Memorial Hospital, Marysville. 10-24

Colorado

DENVER CO.—**Roy N. Gaasland,** 1161 Ellis St., Bellingham, Wash.—$500,000 to move 120 by 608 ft. bldg. from Farragut, Idaho, to university at Denver. Finished struct. will have 81,000 sq. ft. floor space on first floor and 25,000 sq. ft. on second floor—by Board of Regents, Denver University, Denver. 10-14

PUEBLO CO. — **Platt Rogers, Inc.,** 944 Osage, Denver—$149,991 for building consisting of three govt. furnished "Butler" type metal rigid frame bldgs. connected to wood frame main bldg. at Pueblo — by Bureau of Yards & Docks, Washington, D. C. 10-1

Idaho

ADA CO.—**J. H. Wise & Son,** Box 267, Boise—$124,000 for reinf. conc. printing plant at 24th and Main Sts., Boise — by Syms-York Printing Co., Boise. 10-1

Oregon

MARION CO.—**W. C. Smith, Inc.,** Board of Trade Bldg., Portland—$439,985 for four bldgs. to include one 50-bed cottage, school bldg., shop and gymnasium at state training school for boys, Salem—by State Board of Control, Salem. 10-6

MULTNOMAH CO. — **A. M. Hocken,** 1914 S.E. 46th Ave., Portland—$150,000 for reinf. conc., one-story warehouse on site betw. Hawthorne, Clay, Water Sts., and the river in S.E. Portland — by Holman Transfer Co., Portland. 10-6

MULTNOMAH CO.—**L. H. Hoffman,** 715 S.W. Columbia St., Portland—$1,000,000 for reinf. conc. factory bldg. on N. Burgard St., north of Weyerhaueser Ave., Portland—by Continental Can Co., New York. 10-17

MULTNOMAH CO. — **L. H. Hoffman,** 715 S.W. Columbia St., Portland—$450,000 for one-story, conc. bldg., Portland — by Fibreboard Products Co., Portland. 10-1

UMATILLA CO. — **Waale-Camplan Co.,** 2100 S.W. Jefferson St., Portland—$511,608 to dismantle 36 bldgs. at Ogden Meadows housing project, Vancouver; to transport and re-erect them at McNary dam housing area, Umatilla—by Corps of Engineers, Portland. 10-7

Utah

SALT LAKE CO.—**Paulsen Construction Co.,** 1425 Jefferson St., Salt Lake City—$364,794 for Pioneer Memorial Bldg. to be erected at the head of Main St., Salt Lake City—by State Building Board, Salt Lake City. 10-3

SEVIER CO.—**Ellis W. Barker Co.,** Ness Bldg., Salt Lake City, and **W. W. Clyde & Co.,** Springville, will build a gypsum plant at Sigurd—by U. S. Gypsum Corp., Chicago, Ill. 10-3

UTAH CO.—**Alfred Brown,** Salt Lake City—$144,824 for first units of new compound designated to unify municipal mechanical, warehouse and storage facilities at one point, Provo—by City Council, Provo. 10-3

Washington

CLARK CO. — **Ross B. Hammond Co.,** Box 3901, Portland, Ore.—$500,000 for fireproof, reinf. conc. office, warehouse, manufacturing and boiler plant bldgs. at Vancouver—by Bemis Bros. Bag Co., Seattle. 10-12

KING CO.—**J. C. Boespflug Construction Co.,** Securities Bldg., Seattle—$1,731,932 general contract for constr. of four units to Health Sciences Bldg. at University of Washington, Seattle—by Board of Regents, University of Washington, Seattle. 10-11

LEWIS CO.—**S. S. Mullen,** 9th N. and Roy Sts., Seattle—$125,000 for additions and remodeling dairy bldgs.; additions include a garage and a laboratory bldg., Chehalis—by Lewis Pacific Dairymen's Association, Chehalis. 10-8

PIERCE CO.—**Hall-Atwater Co.,** Arctic Bldg., Seattle—$300,000 for two-story employes' dormitory to house 56 single persons and four families, Rainier State school, Buckley—by Department of Public Institutions, Olympia. 10-17

PIERCE CO.—**Lease & Leigland,** Vance Bldg., Seattle—$2,190,025 for administration bldg. at Seattle-Tacoma Airport, Bow Lake—by Seattle Port Commission, Seattle. 10-8

SPOKANE CO.—**Roy L. Bair & Co.,** W. 1220 Ide Ave., Spokane—$100,000 for two-story, brick addition to warehouse, Spokane—by Northern Pacific Railway Co., Seattle. 10-3

WHIDBY ISLAND—**J. H. Sellen Con-**

struction Co., 228 9th St., North Seattle—$218,105 for 8 marine officers' quarters and 11 enlisted men's quarters, Whidby Island—by Bureau of Yards & Docks, Washington, D. C. 10-3

YAKIMA CO.—**General Construction Co.**, 3840 Iowa Ave., Seattle—$1,726,280 for six-story, T-shaped concrete tuberculosis hospital bldg., Selah—by Joint Sanitoria Committee for Six Counties, Yakima. 10-13

Wyoming

CARBON CO.—**Dawson & Corbett**, Rawlins—$75,000 for all-steel, quonset type, 400 ft. by 81 ft. wool warehouse in Rawlins—by Wyoming Cooperative Wool Marketing Association, Rawlins. 10-16

LARAMIE CO.—**Jacob Weber**, Cheyenne—$349,000 for addition of 54 ft. by 46 ft. bldg. to hospital kitchen, Cheyenne—by Board of Directors, Laramie County Memorial Hospital, Cheyenne. 10-20

Territories

ALASKA—**J. B. Warrack Co.**, Securities Bldg., Seattle, Wash.—$405,150 for addition to depot and extension on freight shed at Anchorage—by Alaska Railroad, Anchorage. 10-2

Canada

BRITISH COLUMBIA—**Thor M. Peterson**, Alberni—will build a 52-room, three-story reinf. conc. hotel bldg. at 3rd Ave. and Burde St., Port Alberni—by Pacific Coast Hotels, Ltd., Alberni. 10-3

Miscellaneous . . .

Arizona

MARICOPA CO.—**General Electric Co.**, Denver, Colo.—$298,726 on schedules 1 and 3, to furn. and deliver transformers, circuit breakers, lightning arresters, etc., for Bank No. 4, Phoenix substation, Davis Dam project—by Bureau of Reclamation, Denver, Colo. 10-9

California

SACRAMENTO CO.—**A. Teichert & Son, Inc.**, Box 1133, Sacramento—$109,858 for streets, sewers, water distribution system, sidewalks, etc., Camelia, Shepard, Callister Aves., East Sandburg and South Sandburg Drs., Sacramento—by City Council, Sacramento. 10-9

Oregon

LANE CO. — **McNutt Bros.**, 351½ East Broadway, Eugene—$1,748,777 for railroad relocation south of Dexter, near Lookout Point Dam Reservoir—by Corps of Engineers, Portland. 10-24

Washington

KING CO.—**University Plumbing & Heating Co.**, Seattle—$837,670 for mechanical work on four new units of Health Sciences Bldgs., University of Washington, Seattle—by Board of Regents, University of Washington, Seattle. 10-11

KITSAP CO.—**Nettleton-Baldwin-Anderson, Inc.**, 1109 N. 36th, Seattle—$3,000,000 negotiated contract for cutting of 2,400 "row housing" units into duplexes, moving them on barge from Port Orchard and unloading them at Vancouver, B. C. — by North Pacific Contractors, Ltd., Vancouver. 10-1

TRADE WINDS

News of Men Who Sell to the Construction West

A.E.D. CONVENTION

Credits, trade-ins, rentals and surplus were stressed as the principal problems facing the industry at the regional meeting of the ASSOCIATED EQUIPMENT DISTRIBUTORS held at the Huntington Hotel in Pasadena, October 9 and 10.

Under the able guidance of **A. F. Garlinghouse,** Director of Region 11, which comprises Arizona, California, Nevada and Hawaii, a splendid business and entertainment program was provided for the members and their ladies who attended the conference.

Carlton Tibbetts, president of WARMAN STEEL CASTING CO., was the principal speaker at the opening dinner meeting. He stressed the need for harder hitting sales policies.

At the conference business meeting held under the chairmanship of **G. G. Curto** of WESTERN MACHINERY CO., San Francisco, **Roy Worth,** past president of the Los Angeles Building Material Credit Association and secretary of the ELECTRICAL CORP. OF CALIFORNIA, gave expert advice on recent business trends and the need for equipment distributors to give added attention to credits.

C. H. Jefferies of GARLINGHOUSE BROTHERS, Los Angeles, outlined the trend of the expanding sales taxes of more and more municipalities and explained many of the basic procedures which equipment distributors must follow to conform with the new regulations.

Under the chairmanship of **Willis Blakeslee** of the PNEUMATIC MACHINERY CO., Los Angeles, insurance problems affecting equipment distributors were discussed. Principal speaker was **James H. Pingree,** president of the ATLAS INSURANCE AGENCY of Beverly Hills.

The membership was particularly interested in the talk given by **Frank Knight,** the new executive secretary of the A.E.D. He explained the reasons for the removal of the executive office from Washington, D. C. to Chicago. The A.E.D. had recognized the fact that the influence of government on the industry's activities was diminishing and that during the years ahead the principal function of the headquarters office should be one of service to the entire membership. Chicago was selected because of its central location. The new offices contain a conference room for the convenience of visiting members. The office is also developing a library of reports of various A.E.D. committees on special subjects such as business forms and parts inventory controls.

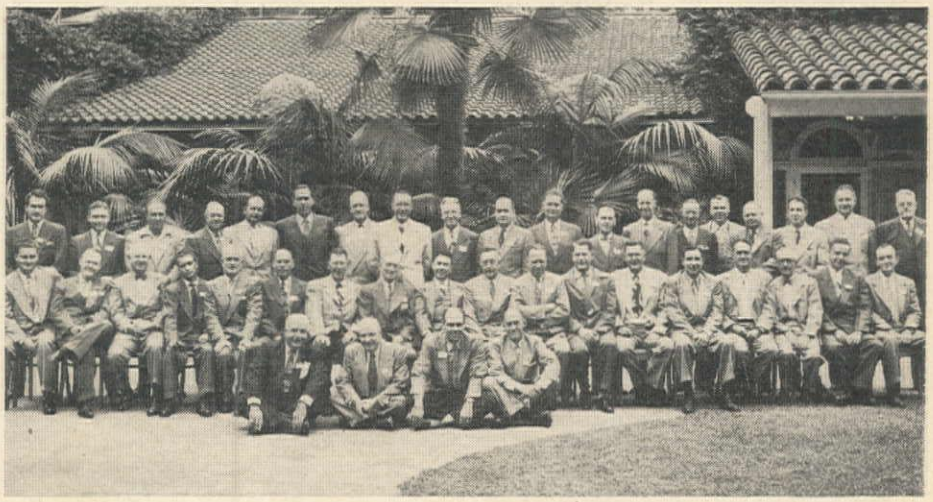
There was some discussion of the competition being suffered by the membership from surplus equipment being returned to this country for resale. Efforts are being made to have such equipment sent to needy countries where much reconstruction must be done.

It was announced that, in conjunction with the 1948 Roadshow, the A.E.D. national meeting will be held in Chicago on February 15-19. All manufacturers will be allocated rooms in the Congress Hotel, and the Edgewater Beach Hotel will be for the exclusive use of distributor members.

Contributing to the success of the regional meeting, in addition to the untiring efforts of Al Garlinghouse, were the following committees:

Entertainment and Program Hosts: Active and allied A.E.D. members of Southern California.

Program Committee: **Willis Blakeslee,** PNEUMATIC MACHINERY CO., Los



IN ATTENDANCE at the A.E.D. regional conference in Pasadena were, l. to r., on ground: PAT LAMB, Industrial Equip. Co.; BEAL SHAW, Shaw Sales & Service Co.; ROY WALLACE, C.I.T. Corp.; H. A. WARNOCK, LeRoi-Rix Machinery Co., all of Los Angeles. Seated, l. to r.: G. H. PILJ, C. P. Concrete Equipment Co., L. A.; E. G. WALKER, LeRoi-Rix Mach. Co., L. A.; LEE REDMAN, Lee Redman Equipment Co., Phoenix; L. E. EDWARDS, JR., McCaffrey-Ruddock Tagline Corp., L. A.; BERT FORNACIARI, Fornaciari Co., L. A.; FRED M. VILES, Fred M. Viles & Co., Spokane; TRACY HARRON, San Francisco; FRANK McBATH, Columbia Equipment Co., Portland, Ore.; FRANK KNIGHT, Executive Secretary, A. E. D., Chicago; A. F. GARLINGHOUSE, Garlinghouse Bros., L. A.; G. G. CURTO, Western Machinery Co., San Francisco; JACK HOW, Edward R. Bacon Co., San Francisco; HERBERT MAYER, Western Machinery Co., San Francisco; WILLIS BLAKESLEE, Pneumatic Mach. Co., L. A.; L. H. GARLINGHOUSE, Garlinghouse Bros., L. A.; LEIGH M. JONES, Western Machinery Co., Phoenix; R. A. HUGHES, Standard Machinery Co., San Francisco. Back row, l. to r.: AL CHAPPELL, Crook Co., L. A.; H. E. HINTZ, LeRoi-Rix Mach. Co., L. A.; WARREN F. MARTIN, LaPlant-Choate Mfg. Co., L. A.; BEN J. SMALL, Industrial Equip. Co., L. A.; BERT J. KOETTERS, M. P. McCaffrey, Inc., L. A.; BARNEY DENNISON, Dennison Tractor & Supply Co., Reno; GAVIN T. KERR, Kerr Equipment Co., San Francisco; DONALD F. FORSTER, Western Construction News, San Francisco; EARL B. MALOON and JOE NUNN, both of Southwest Welding & Mfg. Co., Alhambra; LARRY PILJ and M. D. BOERR, both of C. P. Concrete Equip. Co.; T. H. RHODES, Whiteman Mfg. Co., L. A.; R. A. WHEELER, C. H. Grant Co., San Francisco; JOHN BOWLER, L. A.; J. EARL CONLIN, Shaw Sales & Service Co., L. A.; unidentified; NEWTON WITHERS, L. A.; S. H. WADE, San Francisco.

Angeles, president, Construction Equipment Distributors and Manufacturers of Southern California; **L. T. Pockman,** HYMAN-MICHAELS CO., San Francisco, president, Construction Equipment Distributors Association, San Francisco; **Harry Norris,** CROOK CO., Los Angeles, vice-president, Construction Equipment Distributors and Manufacturers of Southern California; **G. G. Curto,** WESTERN MACHINERY CO., San Francisco, vice-president, Construction Equipment Distributors Association, San Francisco; **R. A. Hughes,** STANDARD MACHINERY CO., San Francisco; **Beal Shaw,** SHAW SALES & SERVICE CO., Los Angeles.

Entertainment Committee: **John Carroll,** HARRON, RICKARD & McCONE CO. OF SOUTHERN CALIFORNIA; **Bert Fornaciari,** FORNACIARI CO., Los Angeles.

Golf Committee: **W. W. Colley,** INDUSTRIAL EQUIPMENT CO. OF SOUTHERN CALIFORNIA; **H. S. Warnock,** LE ROI-RIX MACHINERY CO., Los Angeles.

Reception Committee: **Geo. W. Thatro,** LEE & THATRO EQUIPMENT CO., Los Angeles; **Jack How,** EDWARD R. BACON CO., San Francisco; **Pat Lamb,** INDUSTRIAL EQUIPMENT CO. OF SOUTHERN CALIFORNIA; **Earl Conlin,** SHAW SALES & SERVICE CO., Los Angeles.

☆ ☆ ☆

CALIFORNIA

H. W. Saunders, Emeryville, Calif., district manager for the AIR REDUCTION SALES CO., has announced that the company is expanding its oxygen plant at Sacramento in order to supply the increasing oxygen demands of California. The company also manufactures and distributes acetylene and other gases, calcium carbide, oxyacetylene welding and cutting supplies, and electric arc welders.

☆ ☆ ☆

Richard G. Abbott has been appointed Los Angeles district manager of GOODYEAR TIRE & RUBBER CO.'s Mechanical Goods Division. Abbott, formerly a sales manager for Goodyear at Charlotte, N. C., succeeds **A. L. DuBroy,** who resigned recently. In addition to California, the company's Los Angeles district embraces Nevada, Arizona, New Mexico, and the El Paso, Texas area.

☆ ☆ ☆

At the annual meeting of stockholders of the PARAFFINE COMPANIES, INC., held recently at the company's offices in San Francisco, Calif., all directors were re-elected and **Joseph A. Moore, Jr.,** president of the MOORE DRY DOCK CO. in Oakland, was added to the board. He assumes the vacancy created by the resignation earlier of **Bruce F. Brown.** Brown served continuously since 1919, but retired from the board recently because of ill health.

☆ ☆ ☆

Jack L. Ashby, general sales manager of the Iron and Steel Division of KAISER CO., INC., since its inception five years ago, has been appointed vice-president and assistant general manager of the firm. Ashby will assume supervision of many of the administrative phases of Kaiser Steel to permit **A. B. Ordway,** vice-president and general manager, to devote more time to expansion of the company's facilities for supplying steel to the West. Ordway has also announced the promotion of **C. F. Borden,** assistant general sales manager, to succeed Ashby as general sales manager. Ashby and Borden will continue to maintain their headquarters in the Kaiser Building in Oakland, Calif.

☆ ☆ ☆

Tournalayer Sales Division of R. G. LeTOURNEAU, INC., has announced the opening of a division office at 5007 E. Washington Blvd., Los Angeles, Calif. **George C. Tracy** of the Longview, Tex., office is now in California handling details until a permanent office manager is named.

☆ ☆ ☆

William R. Willard has been appointed to the post of Director of Organization Planning for COLUMBIA STEEL CO. of San Francisco, subsidiary of United States Steel Corp. During his career at Columbia Steel, Willard has been active in the field market research department and for the past five years has been administrative staff assistant in the office of the president of the company.

☆ ☆ ☆

SUPER CONCRETE EMULSIONS, LTD., of Los Angeles, announce the opening of their San Francisco office at 420 Market St., under the supervision of **Robert P. Moffett,** sales manager. Moffett has been connected with construction work for many years, and during the war held a responsible position with the Seabees on Guam and other South Pacific islands.

☆ ☆ ☆

H. J. Ryan, sales manager for the Construction Machinery Division of SOUTHWEST WELDING AND MANUFACTURING CO., Alhambra, Calif., died recently as a result of injury received in


PACIFIC
SUPER
STEEL
PREFORMED
WIRE ROPE
PACIFIC WIRE ROPE COMPANY
LOS ANGELES 21, CALIF., U.S.A. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

World War I. Ryan entered the construction machinery business soon after that war, and held executive positions with the MACK TRUCK CO., NORTHWEST ENGINEERING CO., WORTHINGTON PUMP & MACHINERY CORP., and Bureau of Yards & Docks before coming to Southwest in 1945.

☆ ☆ ☆

Charles H. Mortensen of Los Angeles, Calif., has been appointed executive secretary of the PRODUCERS' COUNCIL, national organization of building products manufacturers. Mortensen has been serving as West Coast representative of the American Iron and Steel Institute for the last two years.

☆ ☆ ☆

W. Ray Culp has been appointed manager of industrial sales on the Pacific Coast for the Paint Division of PITTSBURGH PLATE GLASS CO. Culp has served the company at its branches in Fresno, Sacramento, and Oakland. He succeeds **R. Stanton Richter,** who will serve the West Coast area as a sales representative specializing in automobile production finishes.

☆ ☆ ☆

John M. Stetter, superintendent of BETHLEHEM PACIFIC COAST STEEL CORPORATION's bolt and nut department at their South San Francisco plant, died recently from a heart attack at his home in Burlingame. He was 80 years old and had put in a full day's work on the day prior to his death. Stetter had been in charge of the department since 1928, and had been a consultant on operations and new facilities for all three of Bethlehem Pacific's bolt and nut plants.

☆ ☆ ☆

STANDARD MACHINERY CO., San Francisco, Calif., will now distribute Buckeye Trenchers, Model 70 "Clipper" shovels, backhoes, cranes, and Buckeye fine graders and spreaders in northern California. In the near future, an expanded parts stock will be maintained and field service will be available at Standard's San Francisco headquarters.

☆ ☆ ☆

THOMPSON-SAGE, INC., Stockton, Calif., has been appointed authorized agent for the complete line of shovels, cranes, and draglines in the territory surrounding Stockton by the SHOVEL AND CRANE DIVISION of LIMA-HAMILTON CORP., Lima, Ohio.

☆ ☆ ☆

A. G. Bussmann of the WICKWIRE SPENCER STEEL DIVISION of the COLORADO FUEL AND IRON CORP., New York City, died recently. He had been associated with the Wickwire Spencer Steel Co. since 1931, most recently holding the positions as assistant to the president and general sales manager. At the time of his death, he was in charge of sales for the Wickwire Division.

☆ ☆ ☆

PACIFIC NORTHWEST

PUGET SOUND SHEET METAL WORKS, Seattle, has been appointed distributor by two building materials manufacturers, the H. H. ROBERTSON CO., of Pittsburgh, and J. ROYDEN ESTEY & SONS, Los Angeles. The Robertson line includes steel decking, roofing, and siding in both flat sheets and corrugated, and ventilators. The Estey line consists of aluminum extrusions for skylight sash, monitor sash, fixed side wall sash, and saw-

tooth sash. **Dewey R. Thibeau** has recently joined the staff of the company as general manager of its new corrugated sheeting division.

☆ ☆ ☆

INTERNATIONAL HARVESTER CO., Motor Truck Division, in Chicago, Ill., has announced that **W. C. Habert,** formerly assistant manager at West Haven, Conn., has been transferred to the office in Portland, Ore., in the same capacity to replace **H. O. Juckeland,** who has resigned to enter business for himself.

☆ ☆ ☆

GEORGE M. PHILPOTT CO., San Francisco distributor of bearings, pumps, and air compressors, has awarded a contract to R. T. Casey and W. E. Barrett for remodeling a building at 1635 N.W. Raleigh St., Portland, which will serve as Oregon headquarters for the firm. **Ned Rodgers** is manager of the Portland office.

☆ ☆ ☆

W. D. Andrews has sold his interest in the ANDREWS MACHINERY and the ANDREWS EQUIPMENT SERVICE of Oregon to **Roy G. Anderson,** construction engineer of Vancouver, Wash., who will continue the business in the same location in Portland. Andrews has retained his interest in Spokane and Seattle offices of Andrews Machinery and will continue in active management of them.

☆ ☆ ☆

NEWELL TRUCK EQUIPMENT CO., Portland, has begun the construction of a new building to provide increased space for its manufacturing operations. The company distributes HERCULES hoists and truck bodies, and manufactures a complete line of all-steel truck bodies. **Ed Newell** is manager of the company. Construction of the new building is being handled by S. P. Lonner, Portland contractor.

☆ ☆ ☆

Harold A. Deppe, formerly of Smithfield, Utah, has been appointed general manager of the COLUMBIA BASIN BRICK & TILE CO. at Pasco, Wash. Construction of the company's plant will begin as soon as equipment on order arrives in Pasco.

☆ ☆ ☆

NORTHWEST AGGREGATE, INC., has recently placed in operation a $80,000 plant west of Portland for the manufacture of a light weight aggregate used as a building material. The company is headed by **K. C. Bergstrom,** president. **Robert E. Brooks** is vice-president, and **Alvin C. Warren** is secretary-treasurer.

☆ ☆ ☆

AMERICAN STEEL WAREHOUSE CO. has been appointed distributor for aluminum mill products of the REYNOLDS METALS CO. The company has just completed a 50 by 200-ft. addition to its Portland plant. **Hugh Hedinger** heads the company as president with **Frank Alterhofen,** secretary; **A. D. Kaiser,** treasurer; and **A. W. Knutson,** manager.

☆ ☆ ☆

PACIFIC HOIST & DERRICK CO., Seattle, has been appointed distributor for western Washington for GALION IRON WORKS & MANUFACTURING CO. of Galion, Ohio. Galion motor graders and rollers will be handled by the company which has as its officers **Elmer Schoen,** president; **George Schoen,** vice-president and secretary, and **A. T. Rautenberg,** executive vice-president.

☆ ☆ ☆

Hugh Watt, formerly with the MASON MATERIALS CO. of Shelton, Wash., has joined the sales staff of GRAYSTONE CONCRETE PRODUCTS CO. in Seattle, where he will specialize in the sale of concrete masonry and allied building materials.

☆ ☆ ☆

INTERSTATE TRACTOR & EQUIPMENT CO. has awarded a contract to Todd Building Co., Roseburg, Ore., for construction of a 13,000-sq. ft. addition to its Roseburg store. Interstate's headquarters are in Portland with branch stores at Salem and Eugene as well as Roseburg.

☆ ☆ ☆

CONCRETE PRODUCTS ASSOCIATION OF WASHINGTON is the new name chosen by the organization formerly known as the Concrete Pipe & Products Association with headquarters in Seattle. **C. M. Howard** is engineer for the association whose membership comprises a majority of the major concrete product manufacturers of the state of Washington.

☆ ☆ ☆

Kyle Hesse has been appointed head of the new Tacoma office just opened by A. H. COX & CO., equipment distributor of Seattle. Hesse was in the parts department of the Cox organization for several years before the war, and since returning from service with the Air Forces has been as-

sistant manager of the RENTAL MACHINERY CO. at Tacoma. He will continue to handle business for Rental Machinery Co. as well as Cox.

☆ ☆ ☆

INTERMOUNTAIN

SCHLOSS & SHUBART, engineering and sales organization marketing power transmission, conveying and mechanical handling devices in Colorado, Utah, Wyoming, New Mexico, and Montana, have announced the opening of their new office and warehouse building at 1626 Wazee St., Denver, Colo. The 20,000-sq. ft. structure was formerly occupied by the U. S. Treasury procurement division. Schloss & Shubart represent the JOY MANUFACTURING CO., LINK-BELT and other companies.

☆ ☆ ☆

J. B. Beatty, formerly of Rockford, Ill., has purchased the interest of **T. W. McCollum** in the Hi-Line Equipment Co. of Great Falls, Mont., and taken over the managership of the company which has been renamed the NORMONT EQUIPMENT CO. **W. C. Hardie,** Billings, Mont., is president of Normont.

☆ ☆ ☆

Purchase of the INDUSTRIAL EQUIPMENT CO. in Phoenix, Ariz., by **H. B. Poinsett, Jr.,** and **R. M. Jaap,** has been announced. The company, purchased from the BECHTEL CONSTRUCTION CO. of California, still will be known by the same name and will remain in its present location. It will serve the construction and building industries of the Phoenix area with these distributorships: La Plant-Choate, Warner and Swasey, Gradall, Manitowoc shovels, Quickway shovels and cranes, Universal crushers, Simplicity screens, Cascade winches, Reese loaders and various small tool and supply lines.

☆ ☆ ☆

The INTERNATIONAL NICKEL CO. has appointed the METAL GOODS CORP., Denver, Colo., as distributor of primary nickel for alloying purposes and mill forms of Monel, nickel and Inconel in the states of Colorado, Wyoming, and New Mexico.

☆ ☆ ☆

HAVRE READY-MIX CONCRETE CO. expects to be in operation in Havre, Mont., before the end of the year as the first organization of its kind in northeastern Montana. The firm has been organized by **Joe H. Sohm, George W. Snyder,** and **Walter D. Mack.**

☆ ☆ ☆

AMONG THE MANUFACTURERS

The PORTLAND CEMENT ASSOCIATION has added a public relations bureau to its organization. **Hubert C. Persons,** veteran newspaper and advertising man, has been appointed manager of the new bureau. Persons has been on the staff of the Association's advertising and publications bureau since 1934.

☆ ☆ ☆

Elected president of the newly organized AMERICAN SOCIETY OF SAFETY ENGINEERS is **John S. Shaw,** director of safety for the HERCULES POWDER CO., Wilmington, Del. The A.S.S.E. became an independent organization by action of is membership at an annual meeting in Chicago in October. The National Safety Council, of which the society has been an engineering section for twenty-three years, will continue its financial support, and headquarters of the A.S.S.E. will remain at Chicago. **A. D. Caddell** is executive secretary for the organization.

☆ ☆ ☆

Elmer E. Isgren, pioneer member of R. G. LeTOURNEAU, INC., has been appointed vice-president in charge of production. In his new duties, Isgren is responsible for all manufacturing operations at the LeTourneau plants in Peoria, Ill., Toccoa, Ga., Vicksburg, Miss., and Longview, Tex., and will headquarter at Peoria, where the general offices of the company are located. Isgren is also a director of the LeTourneau Corporation and, for the past year, has been manager of the Longview plant. He first joined forces with the organization at its original Stockton, Calif., plant.

☆ ☆ ☆

Two appointments in the organization of the WICKWIRE SPENCER STEEL DIVISION of the COLORADO FUEL AND IRON CORP. have been revealed by **Newell H. Orr,** vice-president in charge of sales. **Paul E. TenHoopen** has been appointed sales manager of the Realock Fence Dept., under **J. S. Eskin,** general

manager of Realock Fence sales for the corporation and subsidiaries. **James A. Old** is the new sales manager of the Hardware Products Dept. Old was recently sales manager of the CALIFORNIA WIRE CLOTH CORP., subsidiary of Colorado Fuel and Iron in Oakland, Calif.

☆ ☆ ☆

THE HEIL CO., Milwaukee, Wis., announces the promotion of **William E. Simons** from sales manager to general manager of the Truck Body & Hoist Division, Road Machinery Division and the Service Division of the company. Simons will continue as sales manager of the Truck Body & Hoist division, and **Dan Pierce** will continue as sales manager of the Road Machinery division. **Charles B. Tamm** and **James Nelson** will also continue in their capacities as manager of the Field Service and Parts Dept., respectively.

☆ ☆ ☆

Paul S. Park has been named manager of the engineering service department of A. M. BYERS CO., Pittsburgh, Pa., manufacturers of wrought iron. The department handles problems dealing with the use of wrought iron pipe and plate in railroad, construction, sewage and waterworks fields.

☆ ☆ ☆

H. W. Vine has been appointed as manager of industrial sales for the GORMAN-RUPP CO., industrial pump manufacturers in Mansfield, Ohio. Vine has spent many years as a sales engineer in the industrial pump field. He worked for the past year as general sales manager of the Carver Pump Co., in Muscatine, Iowa.

☆ ☆ ☆

The PETTIBONE-MULLIKEN CORP. of Chicago, Ill., received this year's "Oscar of Industry" award for what was adjudged by the independent board of judges as the best 1946 annual report in the rail equipment industry. The trophy was formally presented to a representative of **E. Joseph Seifert**, president of the company, at the Annual Report Awards Banquet held in New York City recently.

☆ ☆ ☆

Ned A. Ochiltree, formerly executive vice-president, has been elected president of CECO STEEL PRODUCTS CORP., Chicago. Ochiltree has been with the company since 1915 and was appointed a vice-president in 1927. **C. Louis Meyer**, founder of the corporation and formerly president, has been named to the new position of chairman of the board. The company fabricates reinforcing steel and manufactures metal construction products.

☆ ☆ ☆

R. H. Newton has been appointed to a newly created office of Manager of Dealer Sales for the LINCOLN ELECTRIC CO., Cleveland, Ohio. He was brought to Cleveland from Minneapolis, Minn., where he was district sales manager, to work

under the new title in franchising and organizing welding equipment dealers throughout the country. This work will be the Lincoln company's effort to develop an organization to sell and service the mass market created by the expanding use of welding in the small manufacturing, service industry and agricultural fields.

☆ ☆ ☆

Roy A. Shipley of Pittsburgh, Pa., was re-elected president of the STRUCTURAL CLAY PRODUCTS INSTITUTE, national association of brick and tile manufacturers, at the Institute's recent convention in Washington, D. C. Shipley is president of the NATIONAL FIREPROOFING CORP. Other officers, also re-elected, are: **Joseph A. Brown,** Baltimore, Md., of the BALTIMORE BRICK CO., vice-president; **W. Gardner Long,** Boston, Mass., with the NEW ENGLAND BRICK CO., treasurer; and **J. J. Cermak,** Washington, D. C., secretary.

☆ ☆ ☆

J. D. McCall has been appointed as general superintendent at the Pittsburg, Calif., plant of COLUMBIA STEEL CO. He succeeds **J. A. White,** who has resigned. McCall had been assistant superintendent since 1942 prior to his appointment. Columbia Steel also announced other operational appointments in connection with its new $25,000,000 sheet and tin plate mill which is now being built at the Pittsburg plant. They are **D. E. Rice,** assistant general superintendent; **Donald W. Lasell,** division superintendent, sheet and tin mill; **Charles C. Morgan,** assistant division superintendent, sheet and tin mill; **William L. Clark,** superintendent for cold reduction in the mill; **T. L. Carroll,** chief industrial engineer, operating department; and **Edwin E. Slagle,** works industrial engineer.

☆ ☆ ☆

Franklin M. McCorkel is a newly appointed district manager for the NEW HOLLAND MANUFACTURING COMPANY, Mountville, Pa., it was announced by **Victor Despard,** general manager. McCorkel will handle the territory of Ohio, Kentucky, Michigan less the upper peninsula, West Virginia and Tennessee east of the Tennessee River.

☆ ☆ ☆

B. H. Johns, for the past seven years manager of the St. Louis branch of the INDEPENDENT PNEUMATIC TOOL CO., has been appointed manager of the company's mining and contractors' tool sales division, with headquarters at Chicago. Johns has been a member of the sales organization for 21 years and served previously as manager of the Philadelphia branch. **W. B. Smith,** former manager of the Houston, Tex., branch will succeed Johns as manager of the St. Louis branch.

☆ ☆ ☆

The commercial engineering department of SYLVANIA ELECTRIC PRODUCTS, INC., New York City, has been enlarged and will now include activities of the company's Lighting Center in New York, as announced by **B. K. Wickstrum,** general sales manager of the Lighting Division. **Don P. Caverly,** director of the Center, has been named manager of the expanded commercial engineering department, succeeding **Harris Reinhardt,** who was appointed assistant to the director of industrial relations for the company. Caverly joined Sylvania Electric in 1937 as a commercial engineer, and has lectured throughout the United States on the use of electronics in commerce and industry.

☆ ☆ ☆

W. G. "Bill" Beriswell has been appointed as assistant sales manager for the MILWAUKEE HYDRAULICS CORP. in Wisconsin. Beriswell will spend most of his time traveling and will appoint and work with distributors who will handle the Hydro-Crane, product of the corporation. He has had varied experience in the field as salesman for crane-excavator manufacturers.

☆ ☆ ☆

Announcement has been made of the appointment of **Hubert E. Snyder** as managing director of the TONCAN CULVERT MANUFACTURERS ASSOCIATION, which is composed of manufacturers and engineers who use Toncan iron in drainage structures for highways, railroads, and airports. Snyder, who is a civil engineer, served in both World War I and the recent war, and since his retirement has been associated with the Penn Metal

Corporation of Philadelphia. Prior to the recent war he was engaged in culvert manufacturing in Elmira, N. Y. The Toncan Association has recently moved its offices to Room 909 in the Midland Building, Cleveland, O. Snyder succeeds **P. H. Pickering** who has resigned.

☆ ☆ ☆

Production of the Haug Type Constant Current Regulator will be undertaken exclusively by the HEVI DUTY ELECTRIC COMPANY, Milwaukee, Wis., according to announcement made jointly by **Milton M. Morse,** president of MODERN CONTROLS, INC., Chicago, Ill., and **Harold E. Koch,** Hevi Duty president. Sales will be handled by both companies. The Haug Type Constant Current Regulator, for use principally in street and airport lighting, has no moving parts, and may be either air or oil cooled.

☆ ☆ ☆

GARDNER-DENVER CO. officials announce the opening of three new branch sales and service offices, to be located in New Orleans, Cleveland, and Kansas City. **M. B. Morrisette** is new branch manager of the New Orleans office, **R. A. Williams** is manager of the Cleveland office, and **E. C. Wallace** is managing the new Kansas City office.

☆ ☆ ☆

C. W. Ballard, assistant manager of HERCULES POWDER COMPANY's explosives department in Pittsburgh, Pa., has been appointed manager. He succeeds **John M. Martin,** who has been made assistant general manager of the company's cellulose products department in Wilmington, Del. Prior to his employment by Hercules, Ballard was a mining engineer with the Valley Camp Coal Co. and a technical representative of the Cardox Corporation.

☆ ☆ ☆

Morrough P. O'Brien, former dean of engineering of the University of California, has joined the engineering staff of AIR REDUCTION CO., INC., New York City. O'Brien will be in charge of general and process engineering and assumes the direction of liquefaction research. He is the author of numerous works on engineering subjects.

☆ ☆ ☆

H. C. Edwards, formerly chief engineer of research and development for the TIMKEN ROLLER BEARING CO. of Canton, Ohio, has been appointed director of those activities for the company. **Walter F. Green,** assistant manager of research and development will become manager. Edwards succeeds **J. F. Leahy,** who has retired after 45 years of service with the Timken company. Leahy was the first to be in charge of the research program when it was created in 1943.

☆ ☆ ☆

Harry Y. McCool, Sr., veteran of thirty-one years' service with the TIMKEN ROLLER BEARING COMPANY, Canton, O., retired recently as superintendent of maintenance of the company's steel and tube division, a position he had held since 1938. **Leland S. Steiner,** who has been with the company since 1925, has been appointed as McCool's successor.

☆ ☆ ☆

H. C. Allington has been appointed General Manager of Sales of the WICKWIRE SPENCER STEEL DIVISION of THE COLORADO FUEL & IRON CORP., with offices in New York City, according to recent announcement by **Newell H. Orr,** vice-president of the latter corporation. With a background of many years of sales work in the East, Allington joined Wickwire Spencer in 1943 as manager of a new products department, and within a few months he was selected Assistant General Sales Manager, which position he held until the present appointment.

☆ ☆ ☆

W. E. Madden has been appointed as sales and division manager of the Conveyor Division of the GEORGE HAISS MANUFACTURING CO., New York City, wholly owned subsidiary of PETTIBONE-MULLIKEN CORP. Madden has been associated with the conveyor industry in a sales management capacity for the last twenty years, and was division and sales manager of A. B. Farquahar & Co. from 1931 until his recent new appointment.

Quincy Bent has retired as vice president in charge of the Steel Division operations for BETHLEHEM STEEL CO. He will continue as vice president in an advisory and consulting capacity and as a director for the Bethlehem Steel Corp. until the end of this year. Bent is succeeded by **S. J. Cort,** formerly general manager of the company's Sparrows Point, Md., plant.

☆ ☆ ☆

Harold H. Reed, formerly assistant manager of AIR REDUCTION SALES CO.'s New York District, has been appointed manager of this district, succeeding **W. S. Schoenthaler,** retired. Succeeding Reed as assistant manager is **Oren M. Donohue,** who for the past three years has been assistant sales manager. **William B. Brower** who joined the company in 1922 now succeeds Donohue as assistant sales manager.

NEW EQUIPMENT

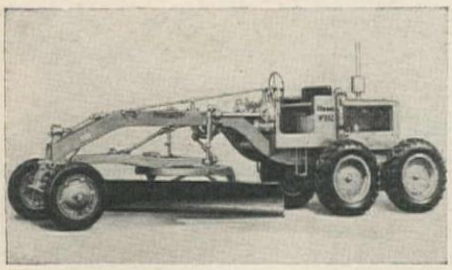
MORE COMPLETE information on any of the new products or equipment briefly described on these pages may be had by sending your request to the Advertising Manager, Western Construction News, 503 Market Street, San Francisco 5, California.

Motor Grader

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Equipment: New Diesel No. 212 motor grader, powered by the D311 engine.

Features claimed: The maximum output is increased to 45 hp. as compared with the 35 hp. of the preceding model. Its operational advantages stem from speed increases in all of its four forward speeds; from its power operated mechanical controls equipped with effective brakes which prevent creeping or coasting under load; from its arched front axles which provide maximum clearance; and from manufacturing improvements resulting from the use of new, harder metals and better heat treatment. The power increase of the new model comes from the features of design incorporated in the new, more powerful D311 engine which powers it. The four cylinder D311 engine has a ¼-in. bore increase to 4 in., resulting in an increase to 252 cu. in. in piston displacement and the application of stronger connecting rods and a heavier, stronger crankshaft.



Pipe Fitting Machine

Manufacturer: American Die & Tool Co., Inc., Reading, Pa.

Equipment: New model pipe fitting machine.

Features claimed: The new model is designed especially for installation and maintenance of all piping from ½ in. to 2 in. in size, but this range can be extended to all sizes from ⅛ in. to 12 in. by use of simple auxiliary equipment. With the machine it is possible to cut, chamfer, ream and thread any pipe from ½ in. to 2 in. without changing dies. A built-in tool tray and handy dope cup, built-in safety features for the protection of both operator and machine, and a double electric outlet for lights and small power tools incorporated in the switch for the 1 hp. motor are features of the design.

Rock Drill

Manufacturer: Ingersoll-Rand Co., Phillipsburg, N. J.

Equipment: Lightweight utility jackhammer.

Features claimed: This new air-operated drill has been designed for general utility and plant maintenance work. Its light weight and ease of handling make it well suited for use on a ladder or scaffolding and for overhead work. It has strong automatic rotation and uses standard jackbits. By using adapters, star drills can be used to drill holes 1⅛ in. and under. Also by removing the rotation pawls it can be used as a light paving breaker or for chiseling and channeling. Throttled control permits the selection of exactly the right kind of blow for any type of work or tool. Drills, chisels, gouges and moil points are a few of the classes of tools that may be used in their many forms.

Friction Proofing Oil

Manufacturer: Wynn Oil Company, San Gabriel, Calif.

Equipment: New friction proofing oil.

Features claimed: The oil is of supplementary type for use with regular lubrication oils and greases. It is specially compounded for the protection of bearings, cams, wrist pins, cylinder walls, gears and all other friction points in motors and machinery. When used in internal combustion engines, crankcase, transmission and differential, it assures an increase in hp. up to 20 per cent and reduces operating temperatures and friction wear to a minimum. The new oil, perfected in 1939, has been widely used in the automotive and aviation fields, and is now available for general industrial application.

Aviation Marker Light

Manufacturer: Westinghouse Electric Corp., Pittsburgh, Pa.

Equipment: Aviation elevated runway and strip marker light.

Features claimed: Designed to meet CAA Specification L-802, the new day or night marker light quickly identifies the runway or strip in daytime with its brightly colored cone while the light at the top provides an elevated marker at night. The lens assembly is designed to give a symmetric light distribution with the major portion of the light in line with the runway. Lenses and frames are indexed and the entire assembly can be oriented by rotating lens and cone support on the shaft. Rifle sights enable aligning the unit with runway when installing or after relamping. The elevated

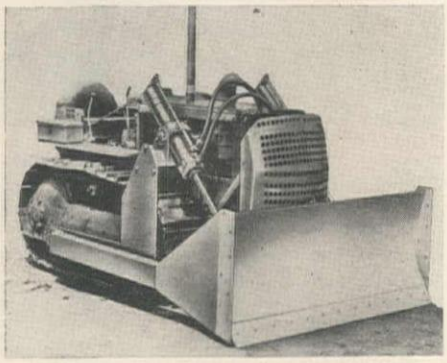
marker light can be used on either 6.6 amp. series circuits or 120-240 volt multiple circuits.

Bulldozer

Manufacturer: Wm. Bros Boiler & Manufacturing Co., Minneapolis, Minn.

Equipment: Hydraulic bulldozers.

Features claimed: The new line of dozers, both straight and angle, available now for D4 and D6 Caterpillar tractors, is frame mounted and incorporates a new compact



hydraulic pump with a minimum of hydraulic piping. The D4 models are the only track-mounted, direct-lift, double-acting hydraulic bulldozers with full-floating trunnion rams and positive down pressure. On the straight models a new reinforced fan tail box construction eliminates multiple welding pieces previously used. This new design permits equally distributed push beam stresses. The moldboard fan tail design is offset from the push frame and made wider for easier maneuvering and less wear. The new straddle mounted cylinder bracket assembly centers lifting power and equally distributes all working forces.

Ceiling Light Improvements

Manufacturer: Homecraft Electronic Products, Chicago, Ill.

Equipment: New fluorescent ceiling light.

Features claimed: Completely recessed lamp holder of clear Plexiglass is one feature of these new lights. The zinc bases of lamp holders are also recessed leaving no parts exposed, and the bulb is brought closer to the reflecting surface. Light is a 32-watt unit, 12 in. in diameter, equaling the output of ordinary 100-watt bulbs. Fixture, which is 13 in. x 4¼ in. high, is easy to install and has a replaceable spring-type knockout button for spring chain or drop-cord installation.

Earth Drill

Manufacturer: Buda Co., Harvey, Ill.

Equipment: New hydraulically controlled earth drill.

Features claimed: The Model HBJ earth drill is engineered for convenient transporting and minimum "set-up" time for digging. Particularly in confined areas where frequent raising and lowering of tower is necessary, this factor of "setting-up" time is all important. Steady hydraulic power of the HBJ moves the tower into instant operating position. Other finger-tip controls quickly permit adjustment of drill head to a vertical position. All leveling adjustments for either straight holes or anchor holes

are completely hydraulic. The slow-speed 4-cylinder gasoline engine, together with the drilling mechanism, is mounted on an "I" beam of structural steel, creating one complete and packaged unit.

Portable Mix Plant

Manufacturer: C. S. Johnson Co., Champaign, Ill.

Equipment: New 2-yd. portable mix concrete plant in one unit.

Features claimed: The plant is easily moved and quickly erected. The complete unit can be easily moved up close to the job by rail or on flat-bed trucks. Quick, easy, field bolting of sections speeds erection and the unit is ready for operation in one-half the time for an all-bolted unit. It has all welded main sections, bin in two main sections, two column end frames, and floor beams and cross bracing are prefitted.

Truck-mounted Loader

Manufacturer: Eagle Crusher Co., Inc., Galion, Ohio.

Equipment: Eagle Model 400 truck-mounted loader.

Features claimed: The new Model 400 loader increases speed and ease of maneuvering with the incorporation of four new features in the loader; full hydraulic control, lower overhead clearance, conveyor discharge and positive crowd. Speedier one-man operation of loader is gained through adoption of full hydraulic controls operated from platform just behind truck cab, with three to five yard per minute capacity. Lower overhead clearance of the loader requires no adjustment of elevator where clearances are as much as 11 ft., 10 in. Use of the conveyor belt discharge operating on 180 deg. radius allows discharge of wet materials without depending on gravity flow. Positive crowd assures

forward or backward movement of the loader at the operator's touch of the controls. The loader will mount on any new or used 1½ or 2-ton truck, with power supplied by the truck engine through power take-off from the transmission.

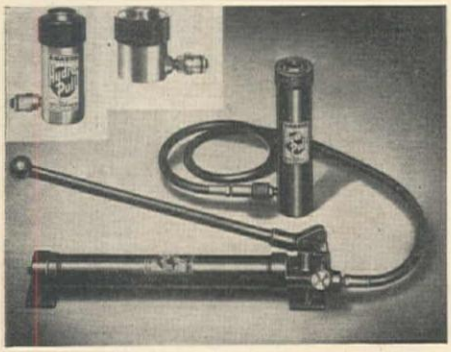
Triple Sleeve Ram

Manufacturer: Sunset Engineering Co., Los Angeles, Calif.

Equipment: New triple sleeve ram with open center.

Features claimed: The Amazon Hydra-Pull can be used to create and apply controlled hydraulic force for pushing, direct pulling, lifting, clamping, bending, pressing, and assembling jobs. The exclusive design incorporating the special center hole running through the full length of the ram allows the use of a drawbar, giving a direct

push or pull of far greater pressure than that of an ordinary ram. The triple sleeve design gives positive control of the ram, eliminating all tendency to wobble even when fully extended, as well as a perfect



fluid seal. Because it is separated from the pump by a safety hose, the ram works easily and freely in all directions. For convenience and utility, various attachments that extend to 8 ft. and which thread easily on the ram are available. Rams may be had in 3, 6, or 11-in. sizes. Capacity of the 11-in. size is 10 tons.

A-C Welding Transformer

Manufacturer: General Electric Co., Schenectady, N. Y.

Equipment: New Type WP 220-440 volt alternating-current welding transformer.

Features claimed: The transformer, designed specifically for use with the Inert-Arc welding process, is built into a single compact unit with entire assembly enclosed in a sturdy drip-proof case with electrical

terminals and gas and water connections brought out to convenient outlets. In order to synchronize and control the operation of the pilot spark, gas and water solenoid valves, and a striking of the arc, a control panel has been built into the welder. After initial adjustments are made on the panel, all components of the welder are operated by means of a simple foot treadle supplied with each machine, allowing the operator to devote his entire attention to the welding operation.

Thread Compound

Manufacturer: Felt Products Mfg. Co., Chicago, Ill.

Equipment: Compound for metal surfaces exposed to high temperatures.

Features claimed: The new C-5 "Hi-Temp" Compound is said to prevent freezing and galling of metal surfaces at temperatures as high as 1,800 deg. F., and was developed specifically for high temperature and high pressure applications, such as furnace tube header studs and plugs. The product is proposed as being useful for petroleum companies, chemical plants, railroads, and other industries.

Hystaway Attachment

Manufacturer: Hyster Co., Portland, Ore.

Equipment: "Hystaway" attachment for track-type tractor.

Features claimed: This versatile unit which combines a dragline, clamshell, and crane with the mobility of a track-type tractor, has been extensively used on the D6 and D7 "Caterpillars," and has been released for the larger D8 model after more than a year of testing. Specifications now call for a ½ cu. yd. bucket on the D7 and D8 with a ⅜ cu. yd. bucket on the D6. The

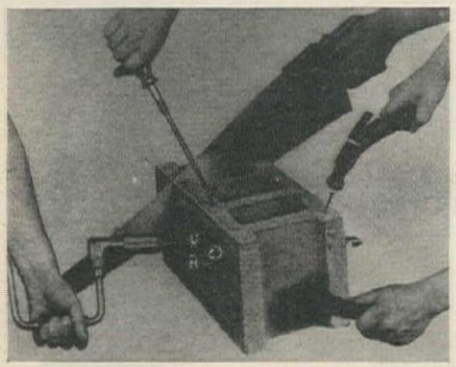
basic Hystaway unit is now made for any of the three models with an attachment group for the specific model. Attachment groups are also made for fitting the unit to wide gauge tractors and to those with additional attachments. Counterweight boxes are available for tractors used without bulldozers.

Construction Block

Manufacturer: Carl Kranz, c/o Marketing Associates, Saginaw, Mich.

Equipment: Patented building blocks.

Features claimed: Mul-Kra blocks, identical in size with regular concrete blocks and containing wood fibre and special mastics, including cement, can be sawed, sanded, drilled, nailed, screwed, and contain much of the same working properties as wood. They have a high compressive strength and thermal conductivity, with an insulating value ten times that of concrete blocks. The light weight blocks are fire resistant, and can be used in combination with concrete blocks and other building materials.



Concrete Dump Body

Manufacturer: Hercules Steel Products Corp., Galion, Ohio.

Equipment: New body for hauling and placing air-entrained concrete.

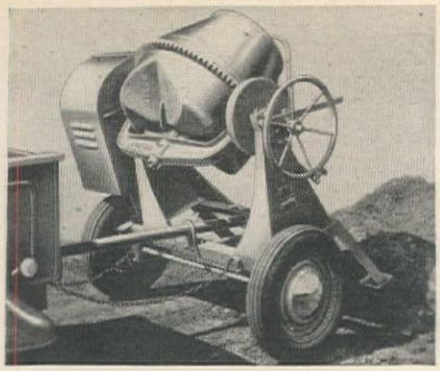
Features claimed: The lightweight, all-purpose dump body is designed primarily for hauling and placing of top quality air-entrained concrete, and is adaptable to the transportation of aggregate and similar bulk materials. The new unit provides smooth, complete discharge of concrete from the bottom of the body first, eliminating segregation and bleeding. Four-point suspension and low hinging provide maximum safety in high discharge operation. Elimination of excess weight and unnecessary mechanisms permits the body to be used in direct pours without any wheeling or buggying as the unit is easily maneuvered even on subgrades.

Off-Highway Truck

Manufacturer: International Harvester Co., Chicago, Ill.

Equipment: New four-wheel heavy-duty off-highway truck.

Features claimed: The Model KBR-14 is available in 161, 179, and 215-in. wheelbases. The 586-cu. in. piston displacement engine develops 200 maximum b. hp. and maximum torque of 475 lb. ft. at 1,000 r.p.m. The model has a gross vehicle rating of from 32,000 to 41,600 lb. This rating depends upon the terrain, road speeds, method of loading, nature of load, gear shifting, etc. It has a 15-in. single-plate clutch, 5-speed transmission with direct-in-fifth as standard and overdrive as optional. The standard axle is full-floating, double-reduction with hypoid bevel gear and pinion in the first reduction. The styling of this unit conforms generally to that of other International models but provides a more massive appearance in keeping with the size and uses of the vehicle.



Tilting Mixer

Manufacturer: Jaeger Machine Co., Columbus, Ohio.

Equipment: Trailer-type tilting mixer.

Features claimed: The 3½-S tilting mixer for mixing concrete, plaster and bituminous materials differs from other machines in that it is towed in mixing position, with support legs at the rear so the unit can be backed directly up to material piles and, with the towpole removed, is immediately ready to go to work without turning or spotting and without projecting feet in front to interfere with the wheeling in of barrows or concrete carts to receive the discharge. The V-bottom drum design combines with two double mixing blades to produce fast, criss-cross movement of the material, adapting the machine to efficient mixing and preventing excessive accumulation of material in the drum. Coil spring suspension, wide-tracking automotive-type wheels with low center of gravity make for fast, stable towing of the mixer behind any light car or truck and assure easy moving on the job.

Portable Field House

Manufacturer: The Harnischfeger Corp., Milwaukee, Wis.

Equipment: New pre-assembled field office or camp dwelling.

Features claimed: The P & H pre-assembled house can be erected easily and quickly in a day by two or three good men, as it comes in finished double-walled sections. The panel construction makes it easy to disassemble if the need arises, when the sections can then be easily transported by truck to the new site. Each house is

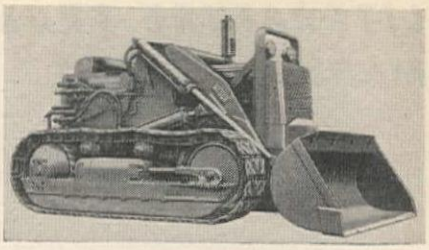
supplied structurally complete with insulation, standard doors, sash, hardware trim, shutters, roofing liner and heavy asphalt strip shingles to create a structure to withstand more storm, stress and vibration than average construction. The interior provides an unobstructed area of 20 by 20 ft., but this can be divided by specially designed partitions, or rooms added for any desired utility.

Bulldozer-Shovel

Manufacturer: Frank G. Hough Co., Libertyville, Ill.

Equipment: 2-yd. Bulldozer-shovel.

Features claimed: The new Model 14, designed into the International TD-14 Diesel Tractor, enables the operator to raise, lower, hold or "float" the bucket, or apply down pressure when hard digging is encountered, by use of a single lever. A large capacity, front mounted hydraulic pump, directly connected to the engine crankshaft supplies power for all operations. The bucket may be dumped partially or completely at any height, and tilts back automatically in carrying position to prevent spillage. Front end superstructures are eliminated, providing the operator with



complete visibility in every direction. The bucket extends the full track width of the tractor, to permit excavation close to walls, embankments and slopes. A full track width bulldozer blade can be attached in a matter of minutes, enabling the shovel to handle a variety of bulldozing jobs consistent with the tractor size.

LITERATURE FROM MANUFACTURERS . . .

Copies of the bulletins and catalogs mentioned in this column may be had by addressing a request to the *Western Construction News*, 503 Market Street, San Francisco 5, California.

ELECTRICITY ON THE FARM—**The Pacific Gas & Electric Co.**, San Francisco, Calif., has published a 34-page booklet in color which vividly describes the many uses of electricity on the California farm. Almost every phase of agriculture makes use of electricity in California. It is used for irrigation, heating soil, cooling fruits and vegetables, sterilizing dairy utensils, fruit juices and poultry rooms; cleaning poultry houses and barns; powering farm machinery, lighting farm buildings and yards; as well as providing the conveniences, comforts and entertainment that the urban home enjoys. These numerous uses are given special editorial attention. The function of and services rendered by the California Committee on the Relation of Electricity to Agriculture and the farm advisory services provided by the California power companies is also explained. The booklet is amply illustrated with action photographs and clever drawings.

ELECTRONIC SCRIBER — **Wheelco Instruments Co.**, Chicago, Ill., has released an eight-page, two-color informative bulletin concerning design, operating and specification data pertaining to the new Wheelco Capacilog, "an electronic scriber." Measuring, indicating, recording and controlling functions are fully explained with principal components clearly illustrated and defined through the use of open cut photographs and line drawings. A separate price list covering terms of sale, available chart ranges and current prices of the various models and accessory items is included.

DOZING THE WAY — **Caterpillar Tractor Co.**, Peoria, Ill., has just published a 16-page booklet picturing the versatility of mighty earth-moving, cable-controlled bulldozers. The booklet contains a generous amount of illustrations showing the various types and sizes of tractors and bulldozer blades used on many varieties of jobs from Coast to Coast. Summaries of jobs ranging from the construction of ferry slips, levees, dykes and canals, logging, railroad siding repair, strip mining and the ever-present job of road construction and repair are emphasized throughout the publication.

TREATED LUMBER—**The American Lumber & Treating Co.**, Chicago, Ill., has issued a new four-page folder covering the usage and specification of "Wolmanized" preservative-treated lumber and "Minalith" fire-retardant lumber. The folder describes properties and characteristics of forest products alloyed with "Wolman" wood-preservative salts and "Minalith" fire-retardant salts, and outlines the pressure-treating process used at the company's nine plants for applying these two treatments and creosote. Proper construction usage of treated wood and standard specifications for treatment are reported in the folder.

PORTABLE BATCHING PLANTS —**Blaw-Knox Company**, Pittsburgh, Pa., has prepared a new color catalogue describing its line of portable batching plants and equipment for aggregates and cement. Also explained and illustrated are the new twin weighing batchers for one-stop batching of aggregates and cement into two-batch trucks and a new portable bulk cement plant with combination arrangements of bins, permitting easy expansion of capacity where needed. The bulletin has useful references to storage, handling and weighing of the materials and a listing of available sizes and models.

RUBBER-TIRED DOZERS—**R. G. LeTourneau, Inc.**, Peoria, Ill., has prepared a new broadside, illustrating and describing the new, big rubber-tired Model C Tournadozer. The large folder opens to 23 in. by 33 in., and illustrates photographically how the speed and mobility of the C Tournadozer can be used to advantage on stockpiling, backfilling, pusher loading and stripping. All of the new design features in this high-speed 'dozer are explained by large-size job action photos showing how the model can be used profitably by contractors, pit and quarry operators, mines, oil fields, railroads, loggers and counties.

MANGANESE STEEL FOR CONSTRUCTION — **American Manganese Steel Division of American Brake Shoe Co.**, Chicago Heights, Ill., has compiled a new 48-page Construction Industry bulletin, wherein illustrated case histories show how various manufacturers have assured customer satisfaction by the use of Amsco manganese steel castings at points of impact or abrasion on their equipment. Other sections show how replacement parts of "the toughest steel known" have added dollars of service to existing equipment and how Amsco Conservation Welding Products have reduced costs for all types of

construction operations by protecting new parts through hard-facing or by rebuilding worn parts. The bulletin, through substantiated facts and on-the-job photographs, covers a broad and representative list of applications for the toughness and durability of Amsco manganese steel in the construction industry.

CORROSIVE FLUIDS PUMP—**Peerless Pump Division,** Food Machinery Corp., Los Angeles, Calif., has released a new color bulletin which describes and illustrates the new centrifugal pump, designated as Type ACO, to help reduce costs of pumping corrosive fluids through ease of handling, prevention of corrosion to pump parts and lower unit maintenance. Special attention has also been given to the details of the Type ACO stuffing box, containing 7 rows of packing in addition to a water seal lantern ring.

ATLAS SPEED FORMS — **Irvington Form & Tank Corp.,** Irvington, N. Y., has recently published a 26-page booklet covering the many ways Atlas Speed Wall Forms are used. Detailed progress pictures, actual job photographs, plus clear editorial comment tell the story of the Atlas Speed method of concrete form construction. The booklet considers: Preparation for Erection, Erection Procedure, Wall Forms Higher or Lower than Standard Units, Stripping the Forms and Handling for Reuse.

DRIVE-IT—**Powder-Power Tool Corp.** of Porland, Ore., has recently issued a color folder describing its new tool "Drive-It" used to drive studs into steel, concrete, brick, sheet metal or wood. The tool furnishes its own power and can be used anywhere. It may be used for building, repair, construction and production work; it also works under water. The folder is amply illustrated with action photographs, as well as pictures of the tool and the materials it uses. Editorial material explains the function and construction of the tool. Letters of recommendation are also printed.

SOUND SYSTEM — **Executone, Inc.,** New York City, N. Y., manufacturer of Intercommunication and Sound Systems, announces the publication of a new booklet—"Sound . . . A Modern Control System"—which presents their complete line of Voice-paging and Music Systems. Graphic illustrations in color show how and Executone Sound System coordinates the activities of a wide variety of businesses by helping locate personnel quickly, speeding repairs and maintenance, relieving switchboard congestion, controlling inventory and production, broadcasting general announcements, etc. Of technical interest is "One Button Control" which makes it possible for the user to clear the entire system of an announcement from any one microphone simply by pressing a button. This booklet points out that an Executone Sound System is useful in all types of organizations — factories, laundries, hospitals, schools, churches, hotels, railroad and bus terminals, retail stores, banks and large offices, to list a few of the concerns that successfully use sound systems.

PUBLIC RELATIONS—**Porter-Cable Machine Company** of Syracuse, N. Y., has published in booklet form a series of articles on the purposes, policies and practices followed by Porter-Cable in its relationships with employees, customers and community. The articles deal with: Inventory Time, Employment Security; Just for Fun; Organized Friends; Leisure with Pay; We're All Partners, and It's Been Nice Talking to You. The company favors a more general adoption of Profit-Sharing Plans wherever possible. It believes that this would provide added purchasing power in the hands of the American workers, thereby offering the soundest assurance that they will be able to absorb and pay for the greatly increased output of American Enterprise.

WROUGHT IRON—**A. M. Byers Company** of Pittsburgh, Pa., has just made available for distribution a 20-page illustrated booklet that described wrought iron, oldest ferrous metal known to man. The title is "The ABC's of Wrought Iron." The booklet tells in non-technical terms what wrought iron is, why it resists corrosion and withstands shock and vibration, how it is made, and how it is bent, welded and threaded. The various services for which wrought iron pipe and plates are used in the industrial, railroad, sewage and waterworks, construction, refrigeration, marine and plumbing and heating fields also are depicted.

SIMPLEX JACKS—**Templeton, Kenly & Co.,** Chicago, Ill., manufacturer of Simplex Jacks for use in shops and plants as well as by contractors, bridge and road builders and truckers, has recently issued a new revised descriptive bulletin on its Simplex lever, screw and hydraulic jacks. Featured on the bulletin's front page is a detailed description of the industrial hydraulic jacks. To the previous line of seven hydraulic jacks of 3, 5, 8, 12, 20, 30 and 50-ton capacities there has now been added a new 100-ton jack. The center spread of the bulletin describes in detail the new single acting ratchet lowering jacks. These 5, 10, 15, 20, 25 and 35-ton jacks are used by contractors, bridge and road builders, truckers and operators of all types of heavy equipment for general purpose lifting, lowering or moving. Specification charts on all these and many other jacks as well as on Simplex-Jenny Center-Hole Hydraulic Pullers, the Util-A-Tool, Drop Forged Steel Trench Braces and Timber Braces are also included in the new bulletin.

PLANNING CONCRETE PLANTS—**The C. S. Johnson Company,** Koehring Subsidiary, Champaign, Ill., has just released the 32-page color booklet dealing with planning of concrete plants. The first publication of its kind in this field, the book contains 60 photographs, 30 illustrations and presents pertinent information on the laying out of stationary and mobile plants. Operating techniques are thoroughly explained and detailed information is given on overhead bins, weight batching equipment, cement and aggregate handling and storage. A definite procedure is outlined for starting either central mix, ready mix or concrete products plants. Blueprint type sketches explain in detail the types and disposition of equipment involved in different installations. Sequences of operation for most efficient output are given for each type of plant. In addition, all auxiliary Johnson equipment is illustrated and described with all latest improvements.

NEW BOOKS...

LESSONS IN ARC WELDING—third edition, published by the Lincoln Electric Co., Cleveland, O. 158 pages, 5½ x 8½. Price 50 cents.

So completely revised that it almost constitutes an entirely new book, it is designed to assist both new and experienced welders. Including 58 lessons, the book also has 228 photographs, illustrations and drawings to supplement the text. "Questions and Answers" contained in the last thirty pages is another valuable feature of the book. The book sets forth in simple language practical instruction based on the experiences of Arthur Madson, head instructor in the Lincoln Arc Welding School. Fundamentals of the method of joining metals by the fusion principle are explained, together with a complete treatment covering welding with alternating current, including both machines and electrodes in addition to the lessons on direct current welding.

* * *

THE CHEROKEE PROJECT—A technical report by the United States Tennessee Valley Authority. Published by the United States Government Printing Office, Washington, D. C. 411 pages.

Technical Report No. 7, as this is called, covers the planning, design, construction, and initial operations of the Cherokee Dam and Reservoir on the Holston River, which unites with the French Broad River just above Knoxville, Tenn., to form the Tennessee River. Special studies and reports of consulting engineers and geologists are also included in this comprehensive report, and another appendix gives a complete list of all major purchases of material and equipment, specially interesting to contractors.

The Cherokee Project's place in the entire TVA scheme is discussed in detail also. Although operated primarily for power during the war emergency, Cherokee forms an integral unit in the over-all system of water control projects in the Tennessee Valley, and, under normal operations, will act for flood control also.

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2—Root-Connorville blowers, 10,000 CFM with 125 HP. syn. motors
2—Root rotary blowers, size 7½, with 100 HP. motors
2—Sullivan air compressors, 868 and 1051 CFM
3—180 HP., 6 cyl. Fairbanks-Morse full diesel engines
2—260 HP., 6 cyl. Superior full diesel engines
1—C. S. Johnson batch plant with 30 ft. dia. hex bin
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1—10S Jaeger concrete mixer
2—D8 tractors with dozers
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