WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

PUBLISHED MONTHLY
VOLUME XXII, No. 3

MARCH • 1947

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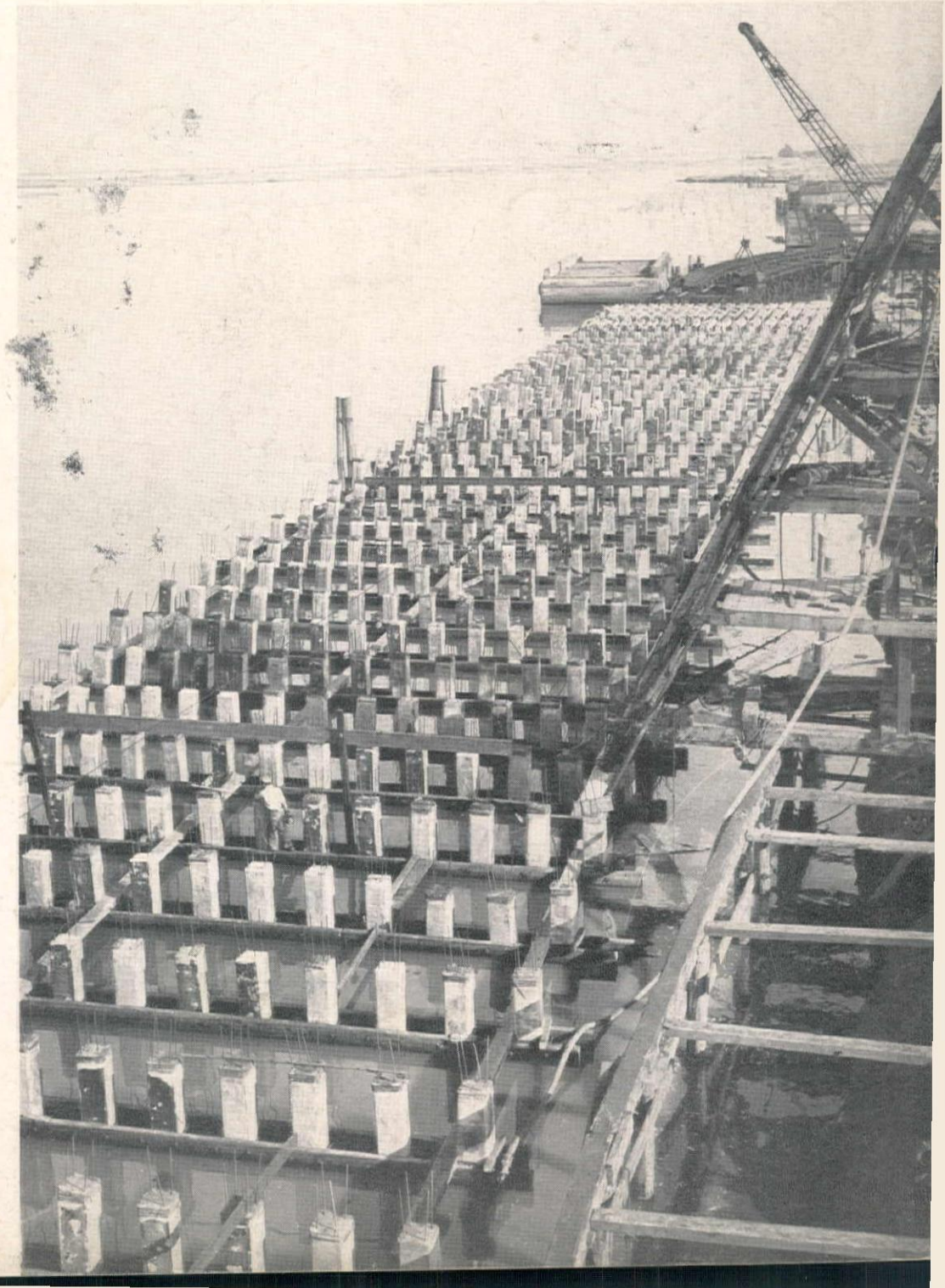
IN THIS ISSUE



CONSTRUCTION of a 600-ft. concrete dock being built in Pittsburg, Calif., as part of the Columbia Steel Co.'s $25,000,000 expansion program, necessitated driving of 1,500 wood and pre-cast concrete piles. Other ship-to-rail facilities for handling raw materials and finished products include a 260-ft. finger wharf for barges.

ASSURE CLEANER VALVES HERE...

GET LONGER DRILL LIFE!

Prolong the life of your drills — assure fewer repairs and replacements — by lubricating them with Texaco Rock Drill Lubricants (E.P.). These famous, extreme-pressure lubricants prevent rust, resist wash-out, effectively protect all moving parts against wear even in the heaviest service. All conform to the lubrication specifications set by leading rock drill manufacturers.

LUBRICATE your compressors with *Texaco Alcaid, Algol or Ursa Oil* and valves will stay *clean* . . . assuring more efficient and economical compressor operation with full air pressure at your drills hour after hour.

Texaco Alcaid, Algol and Ursa Oils are free of impurities that lead to formation of hard carbon deposits. They keep rings free, valve action smooth and lively, ports and air lines clear. They provide Effective Lubrication for all your compressors — whatever their type or size.

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

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

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Tune in . . . TEXACO STAR THEATRE presents the NEW EDDIE BRACKEN SHOW every Sunday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.

Shovel and Crane Operation

THE SIMPLE WAY! THE EASY WAY!

Smooth, easy operation, hour after hour, means full dragline bucket like this and a high daily output.

Here's where the feel of the ...ad counts. North-...st operation on ...tting stone or steel means greater accuracy and safety.

This is all there is to the "Feather-Touch" Clutch Control—simple, positive, dependable.

The easy operation of the "Feather-Touch" Clutch Control goes far to make the Northwest Shovel a real Rock Shovel and assures high output in tough rock digging.

with the Northwest "Feather-Touch" Clutch Control

EASE of operation is one of the secrets of high output! Northwest solved the problem of easy operation a long time ago.

On a Northwest the *power of the engine* shifts heavy drum clutches through a *simple mechanical device* —the "Feather-Touch" Clutch Control. Clutch action is in direct relation to the movement of the operating lever, release is positive and *there can be no shutdown of your equipment because of control failure.*

The "Feather-Touch" Clutch Control is not affected by weather. There are no high pressure lines, no pumps, nothing to refill and it is not affected by temperature—it's simple, positive, dependable! It has been proved in years of all types of service and it assures easy operation that keeps the output up at the end of the day.

Follow the Northwest Crowd and plan ahead to have Northwest equipment.

NORTHWEST ENGINEERING COMPANY
1727 Steger Bldg., 28 E. Jackson Blvd.
Chicago 4, Illinois

...cal NORTHWEST sales agents

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1234 Sixth Ave., South

Euclids SPEED CONSTRUCTION of New Toronto-Barrie Highway

Tapered chute construction and high dumping angle mean quick, clean shedding of the load — an important advantage of Rear-Dump Euclids.

● Construction of the new controlled-access highway between Toronto and Barrie, Ontario, involves moving 7,500,000 cu. yds. of earth. Prominent among the equipment being used on the several contracts are Rear-Dump and Bottom-Dump Euclids.

On one of their contracts Peacock and McQuigge, Ltd. used power shovels for excavation and 15-ton Rear-Dump Euclids for hauling. The Euclids moved clay and gravel from highway cuts for fill at other locations. These contractors also speeded earth moving with a Euclid Loader which delivered 12 bank yds. into Bottom-Dump Euclids in an average of 48 seconds loading time.

On another section Angus & Taylor, Ltd. used 13-yd. Bottom-Dump Euclids, loaded by shovel and elevating grader, to move material on hauls of about one-half mile from cut to fill.

Rear-Dump and Bottom-Dump Euclids combine minimum vehicle weight with maximum strength and capacity. They are built to move pay dirt faster and at lower cost on off-the-highway hauls.

Your Euclid distributor or representative will be glad to provide helpful information for your requirements.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS Move the Earth

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

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Volume 22 | MARCH • 1947 | Number 3

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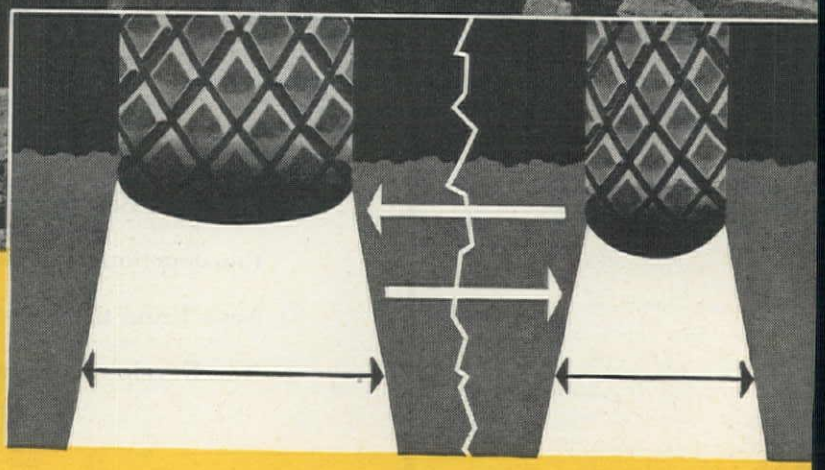
Covering the Western Half of the National Construction Field

"Caterpillar" equipment

LARGER TIRES GIVE LOWER YARDAGE COSTS



They provide—GREATER TRACTION—BETTER FLOTATION—EASIER PULL—LONGER TIRE LIFE

is NEVER UNDER-TIRED

NEVER shall it be said that "Caterpillar" equipment has "too little" of what it takes to do a job right and at lowest cost. It is the "Caterpillar" rule always to provide *more* than the severest operating conditions might demand.

Extra strength, extra-quality materials, extra protection against wear, are plainly evident in every "Caterpillar" part and mechanism. Take tires:

"Caterpillar" Diesel Wheel-type Tractors and Scrapers are tired for maximum production, greatest load flotation and longest tire life.

"Caterpillar" tire specifications have been worked out from the most intensive study of loads, traction, hauling speeds and surface conditions ever undertaken by a tractor manufacturer. They are *engineered* for the job.

Increased wheel diameters with greater tire cross-sections permit low inflation pressures under maximum loads. These features create larger "foot-print"—or bearing areas—reduce power-consuming penetration—give better traction—increase operating speeds over soft earth. Adding tire size also adds (tremendously!) to tire life on the speedier hauls over hard surfaces.

Thus, through practical engineering and job-aid recommendations, "Caterpillar" aims to make your tires as profitable an investment as the rest of your rugged, efficient and dependable "Caterpillar" Diesel Wheel-type Tractor or Scraper.

Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Illinois

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

How to pick the RIGHT SCRAPER

IN times like these it's doubly important to consider every piece of equipment strictly on *its own merits.* This is especially true of tractor-drawn scrapers because regardless of what make of crawler tractors you use, it's the scraper that handles the "payload," which in turn controls your profit on every job. To make the most profit then, it naturally pays to pick the scraper that will move the most yardage at the lowest cost under the widest range of job conditions.

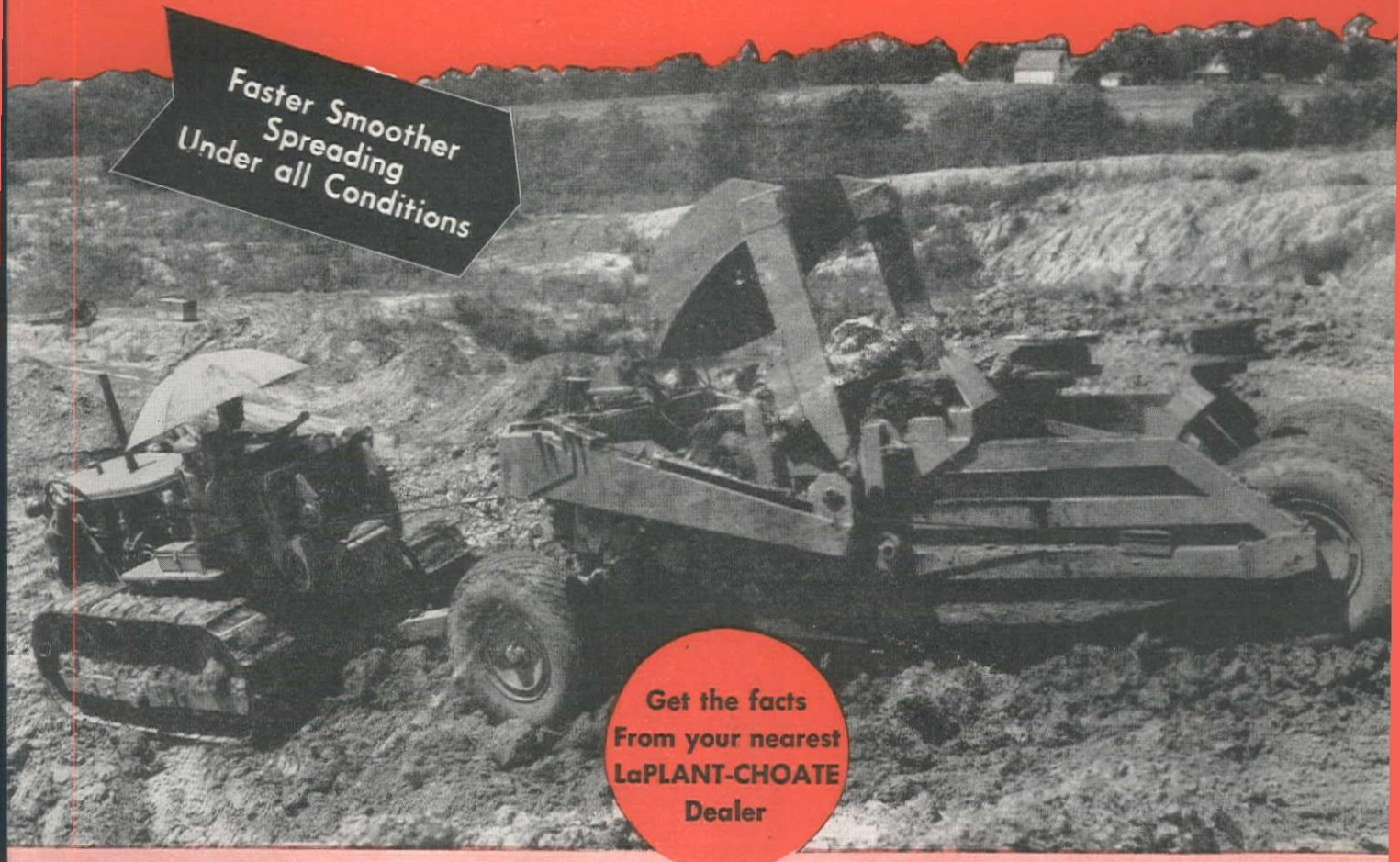
While you hear a lot of "claims" about scraper performance, the fact remains that on hundreds of the world's toughest earthmoving jobs *LaPlant-Choate Positive Forced Ejection Scrapers are outperforming competitive rigs by a wide margin.* They're getting bigger "payloads" faster with less power . . . spreading them faster at the fill . . . and saving hours of costly "down time" for maintenance and repairs. Moreover, LaPlant-Choate rigs are getting these results in all kinds of materials including hard-to-load sand, rocks, sticky gumbo, and whatnot. So why take a chance with inferior, unproved scrapers when you can make more money under more conditions with *job-proved* LaPlant-Choate rigs. Get the facts from your nearest LPC dealer. LaPlant-Choate Manufacturing Co. Inc., Cedar Rapids, Iowa; 1022 77th Ave., Oakland, Calif.

LaPLANT CHOATE

Positive **FORCED EJECTION SCRAPERS**

FIRST in Value because they're FIRST in Performance!

to make the MOST PROFIT!



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NOW THE FIRST 100

In Boston, New York, Philadelphia, and other large cities, cast iron mains are still functioning after more than a century of efficient service. They were laid in the days of horse-drawn vehicles. They were made in the days of rule-of-thumb methods.

They did not have to share the underground with electric power, steam and telephone conduits, sewers and subways. There were no skyscrapers or ten ton trucks. Yet there are more than a score of century-old cast iron mains which have survived stresses, undreamed-of when they were made and laid, that are still rendering efficient service. Certainly the first hundred years of the cast iron water main, laid in Philadelphia in 1822, were not the easiest.

By comparison, cast iron pipe as made today under scientific metallurgical and production controls, and installed by modern equipment and methods, can be confidently expected to live up to the statement in the headline of this advertisement. For cast iron pipe, as it is made and laid today, the first hundred years are now the easiest. Barring abnormal soil conditions, cast iron pipe offers centuries of efficient service.

And by efficient service is meant:

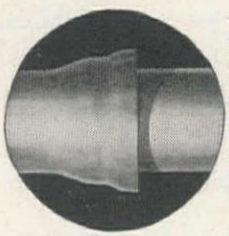
CAST IRON PIPE

YEARS ARE THE EASIEST

"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."

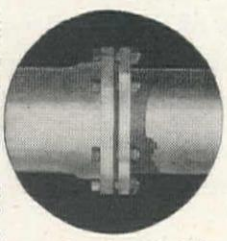
Under the auspices of the American Standards Association, sponsored by the American Water Works Association and other pipe-using organizations, required strengths and thicknesses of cast iron pipe have been computed to meet specific service conditions—the result of a decade of research. For cast iron pipe made a century ago, the first 100 years were the hardest. For cast iron pipe as produced today, there is every reason to believe that the first 100 years will be the easiest.

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.

PUBLIC WATER SUPPLY —the Forgotten Industry

The public takes piped running water for granted—until it's turned off. A good public water supply is never news—except on the rare occasion when something goes wrong. To help create public awareness of the 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* influential readers of "Time" and "Nation's Business." For example, the following illustration and excerpts from a current advertisement:

Town without a future

The town without a future is the town without a public water supply system. Community growth depends on an adequate supply of running water for both home and industrial use.

Sewer systems, for example, cannot function without public water supply. Purification processes have so improved health conditions that typhoid has been reduced almost to the vanishing point.

Due credit for the progress of any town should be given to the farsighted planning and efficient operation of its public water supply system, all too often taken for granted. Yet it is the most important public service in any community, literally indispensable.

* * *

If your town is planning a water supply system, remember that some or all of the original cast iron water mains are still serving in 200 of America's largest cities.

Cast Iron Pipe Research Association, T. F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3.

SERVES FOR CENTURIES

will you be among the expected 40,000????

The forthcoming Western Metal Exposition and Congress to be held in the Oakland Auditorium from March 22nd to March 27th is a "sellout." We are told by none other than the experienced Director of the Exposition, Bill Eisenman, that he has never encountered greater enthusiasm, both among exhibitors and expected visitors.

So . . . if you are interested in any phases of the metal working industries and sciences, you will be in Oakland the week of March 22nd. And . . . since you will be in Oakland, let this be a very cordial invitation from our company to you to visit our Exhibit in the Oakland Auditorium Arena, Spaces A-18 and A-22.

We have seen the advance programs of the participating technical societies—they are tops in topics and tops in speakers.

We have seen the advance reservation lists of the exhibitors—and they promise a wonderful show.

We'll be seeing you at Oakland during the week of March 22nd to 27th.

Cordially yours,

AD182

VICTOR EQUIPMENT COMPANY

GET A LOAD OF THIS LOW-COST MIXING!

Speeding to your construction work, the new Ransome Blue Brute Horizontal Truck Mixer has a way of turning out the best in concrete at costs that mean money in the bank for you. Features like these are the secret of its always expert performance:

Exclusive drum design, stronger and lighter, with Ransome's famous mixing action . . . chilled car wheel metal rollers, each on two Timken roller bearings and running on extra-heavy, heat-treated track . . . smooth, positive gear-and-pinion drive . . . improved transmission with single lever control, two speeds forward and reverse, separate engine clutch and multiple disc reversing clutches . . . trouble-free water system with enclosed pump-clutch, leak-proof poppet valves and unbreakable anti-freeze gauge glasses.

Built with capacities of 2, 3, 4½ cu. yds., this new Ransome Truck Mixer is easier to start, to control, to maintain —a sure bet for time-saving, economical concrete production in transit.

Up above, of course, that's another Blue Brute leader — a Ransome "Big" Mixer — top performer at so many central mixing plants and big-time construction jobs . . . and another reason why *there's more worth in Worthington-Ransome.* R7-4

KNOW YOUR

BLUE BRUTES

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

RANSOME EQUIPMENT

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

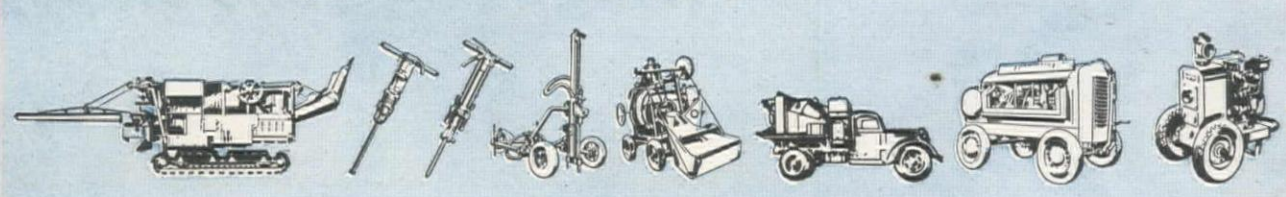
WORTHINGTON EQUIPMENT

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

WORTHINGTON

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

BUY BLUE BRUTES



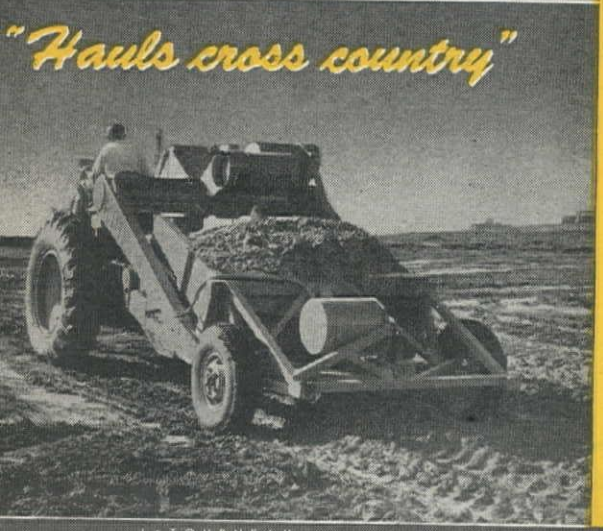
IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

NEW small TOURNAPULL

"Loads, hauls & spreads"

"Travels over pavement"

"Hauls cross country"



23 m.p.h. top speed

3.3 yards pay dirt

Self loading

Positive power steer

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85 h.p. gasoline engine

Tires { 14:00 x 32 primemover
9:00 x 16 on Carryall

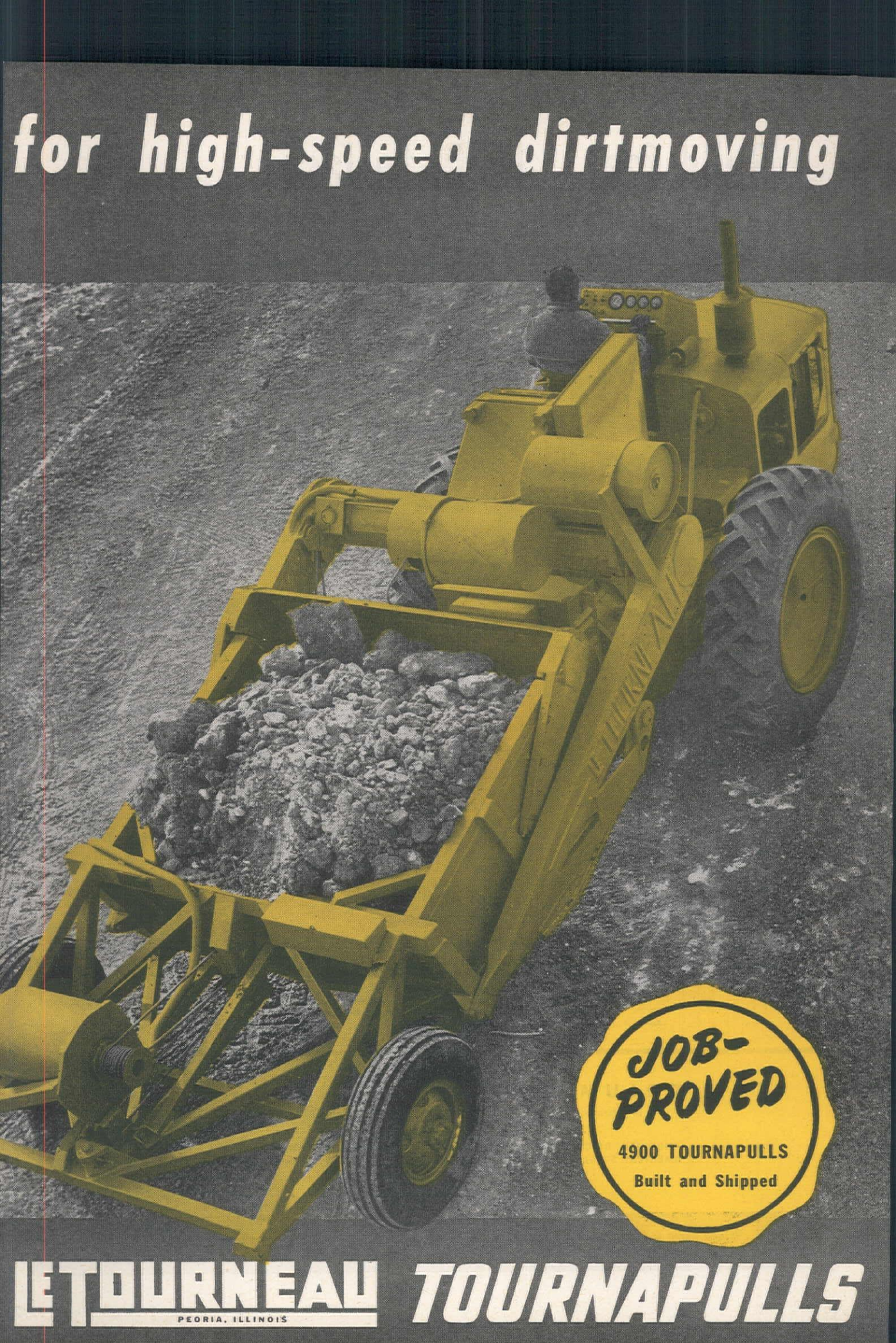
Weighs 7½ tons empty

Tournapull, Carryall—Trade Mark Reg. U. S. Pat. Off. C62

LeTOURNEAU
LET
EQUIPMENT

See your Le Tourneau Distributor NOW for complete information

for high-speed dirtmoving



JOB-PROVED

4900 TOURNAPULLS
Built and Shipped

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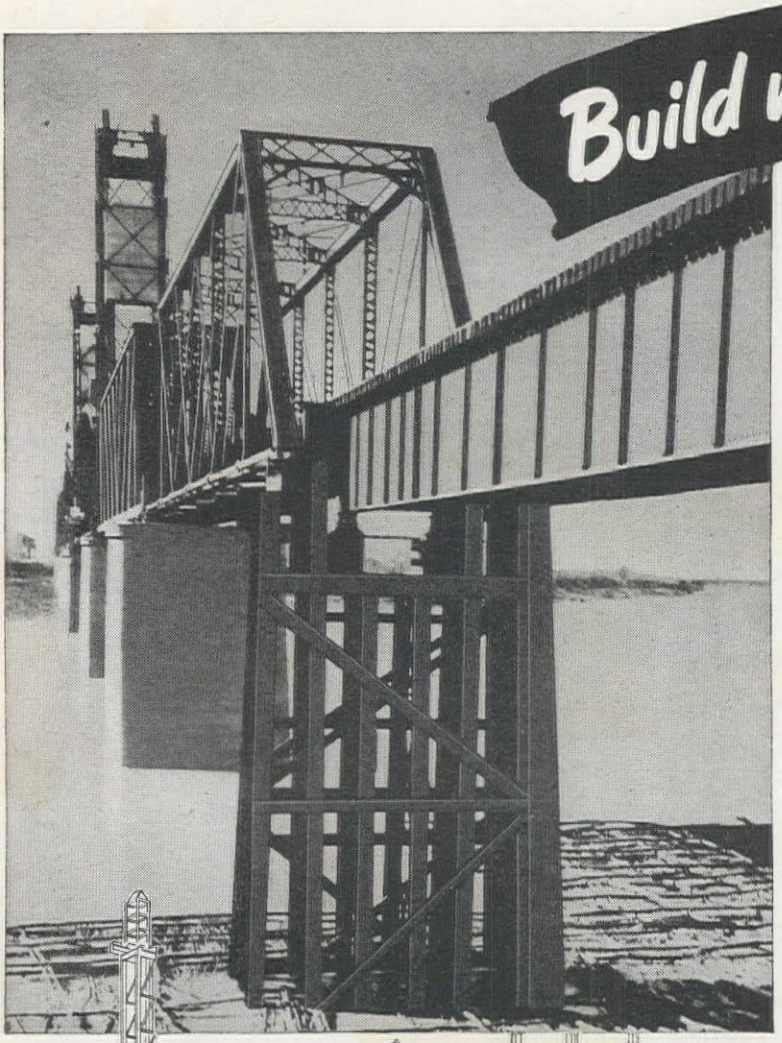
PEORIA, ILLINOIS

TOURNAPULLS

Build fast...Build to last...



Build with STEEL!

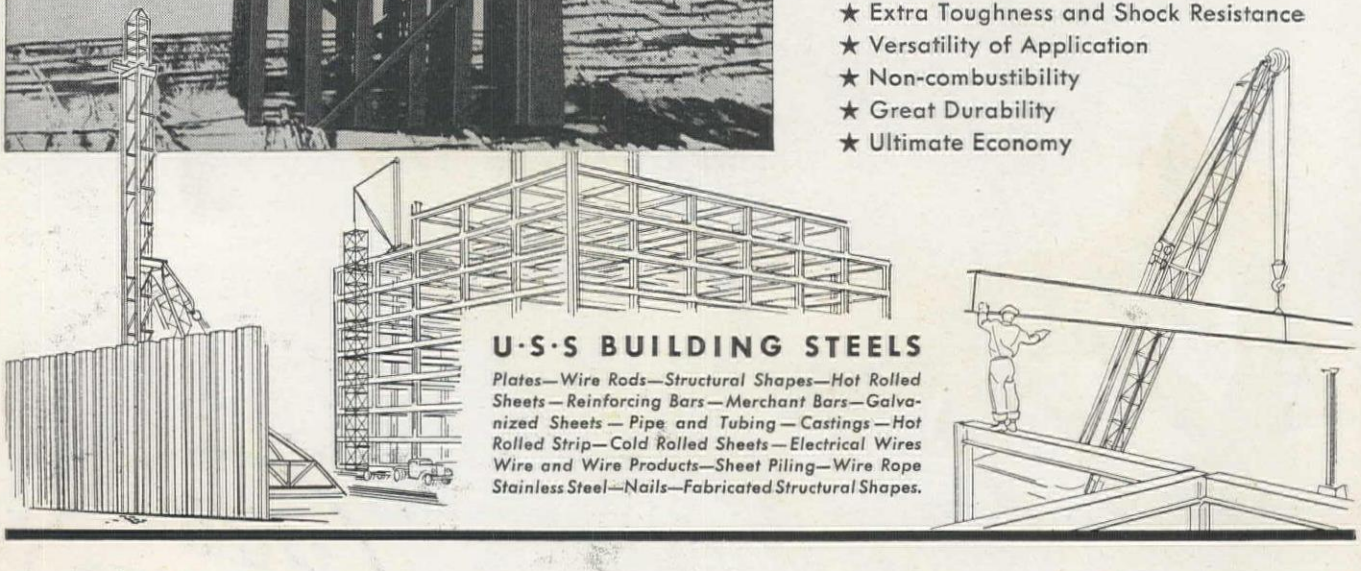
THE West is impatient for better schools, better bridges, better highways. Don't keep her waiting for these and innumerable other important private and public projects. Build *fast* . . . by building with steel.

By using construction steels you eliminate many time-consuming, on-location operations. Steel is delivered, in many instances, ready for immediate use. And, thus prefabricated, it can be put into the job more speedily. Furthermore, steel's long life, great strength, resistance to fire and other destructive forces, plus steel's low upkeep, make it the ideal material for construction work of all kinds.

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

Only Steel can give you all of these seven Structural Advantages

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



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COLUMBIA STEEL COMPANY

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

Pacific Coast Distributors for

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

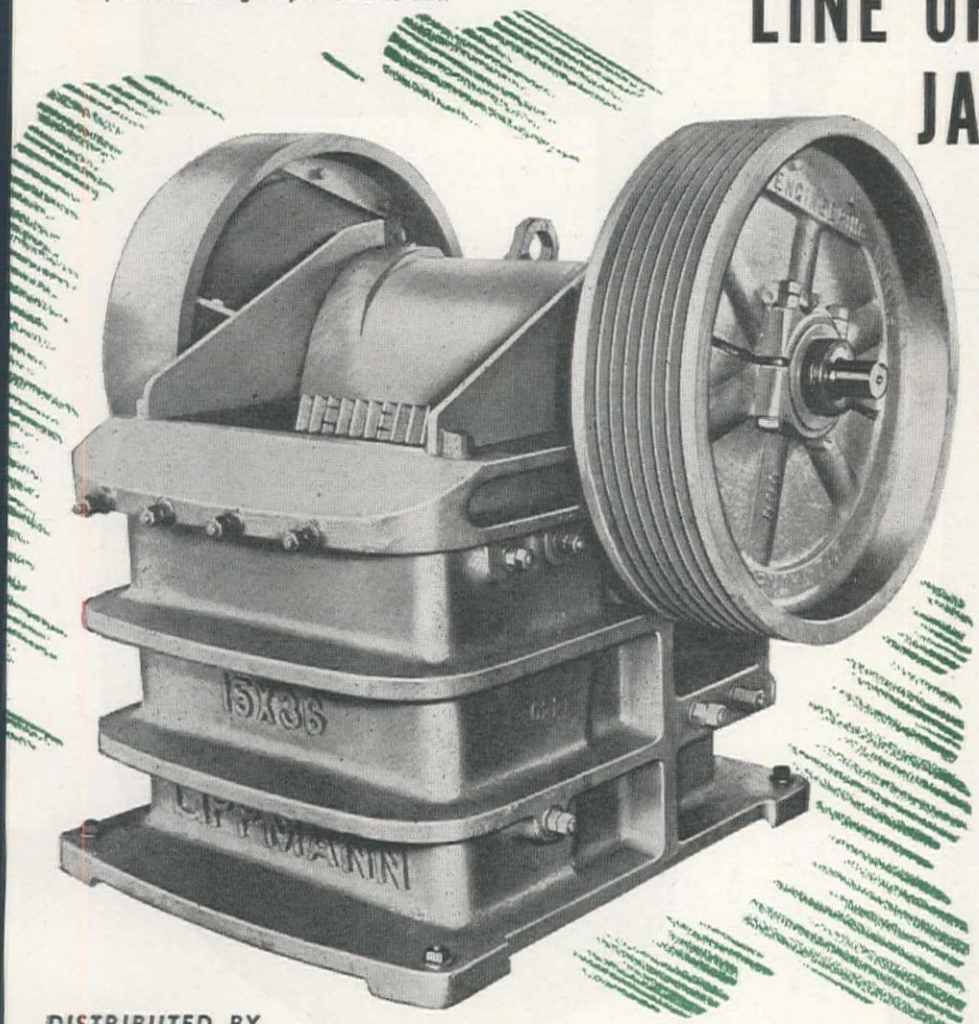
USS STEEL — UNITED STATES STEEL

UNITED STATES STEEL

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.

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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
4603 WEST MITCHELL STREET
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LIPPMANN

A new era in lubrication...

T5

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

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

THE SENSATIONAL PURPLE OIL!

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

AND T5X HAS BEEN THOROUGHLY PROVED BY INDUSTRY!

Just as T5X has passed the stiffest tests of science, so has it met the exacting requirements of industry. Literally thousands of farmers, engineers, shop foremen, maintenance men, etc., who have used T5X have expressed their amazement at the unusual stability and performance of this great oil!

RECOMMENDED USES

T5X is so high in quality, so versatile in its uses, that it will give outstanding protection and performance in any kind of gasoline, Diesel, natural gas or butane-powered engine in *all* industrial operations.

IMMEDIATE DELIVERY

T5X is now available for immediate delivery. For further information about this sensational new *purple* oil, telephone the Union Oil representative in your vicinity, or wire Sales Dept., Union Oil Company, 617 West 7th Street, Los Angeles 14, California.

JUST HOW GOOD IS T5X? TAKE A LOOK AT THESE TEST RESULTS!

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

UNION OIL COMPANY
OF CALIFORNIA

for "dumps" and Euclids

Veedol Super Film Lubricant "A"

Here is a highly specialized lubricant, the best answer ever found for the lubrication of final drive worm gears on dump trucks and gear units on Euclids—Veedol Super Film Lubricant "A." Its combination of qualities has proved it on even the roughest of construction hauls.

One of the unique features of Veedol Super Film Lubricant "A" is its ability to remain fluid throughout its life. This assures easier starting under all conditions, as well as longer protection to vital parts. Its metal de-activator reduces metal deterioration. Its oiliness agent provides greater affinity of oil to metal. Its oxidation inhibitor prevents lumping and loss of lubricating efficiency.

Try Veedol Super Film "A." You can get its entire story from your nearby Associated Representative. A telephone call will do it.

Call your Associated Representative for expert help on any lubrication problem.

Tell Your Associated Dealer You Want a National Credit Card

TIDE WATER ASSOCIATED OIL COMPANY

ALCOA ALUMINUM
CROSSES A BRIDGE

The first span in the world to be built of aluminum alloys, throughout, has been installed on the Massena Terminal Railway Grasse River Bridge near Massena, New York. All shapes and plates are made of high-strength Alcoa 14-S-T Aluminum Alloy. All rivets are Alcoa A 17-S-T Alloy driven cold.

This experimental span is one more example of Alcoa's continuing effort to supply you with more data about the characteristics of aluminum. Built entirely of strong Alcoa Aluminum Alloys, the bridge, in actual use, will demonstrate the fitness of aluminum for heavy-duty structures of this and similar types.

This kind of practical Alcoa research helps you to know exactly how to plan your own use of aluminum. It also steadily widens the fields in which you can apply the special properties of aluminum effectively.

A versatile construction material, aluminum is light in weight, strong, corrosion-resistant. Alcoa Aluminum is available in a variety of alloys—in all commercial forms, shapes and finishes—that may suggest new approaches to your own construction problems. ALUMINUM COMPANY OF AMERICA, 1811 Gulf Building, Pittsburgh 19, Pennsylvania. Offices in leading cities.

MORE people want MORE aluminum for MORE uses than ever

ALCOA FIRST IN ALUMINUM

REG. T. M.

ALCOA ALUMINUM

IN EVERY COMMERCIAL FORM

SERVING THROUGH SCIENCE

SAFETY BONDED CORD

Makes these 3 Huskies Stronger and Sturdier!

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

For off-the-road service where heavy loads roll over rough ground. Deep cleated tread for two-way traction; heavy buttressed lugs for sure grip in soft going; center running rib for longer wear, easier steering.

U. S. ROYAL *LOGGER*

For all operations where traction, long wear and rugged strength are required. Cut-resisting tread protects against injury from rocks, snags. Self-cleaning design maintains maximum traction, prevents rock retention.

U. S. ROYAL *Fleet Delivery*

For service that subjects tires to abrasive "stop-and-start" wear. Extra-thick, massive tread and buttressed shoulders deliver *more* mileage, protect sidewalls against curb scuffing. Center running rib makes rolling easier, adds to tread life.

These rugged U. S. Royals have the *extra* strength of U. S. Safety Bonded Cord construction! *Each cord* is rubber-coated for heat and friction insulation . . . and "webbed" together into a tire fabric unequaled for wear!

In *all three* the tire body is attached to the steel wire beads by a specially designed bead anchoring that rigidly ties the beads to the carcass. And *all three* have two extra shock pads under the tread to guard against impacts and blowouts.

The *tread* design of each tire is the result of extensive engineering tests *in the field!* The result? *Peak performance!*

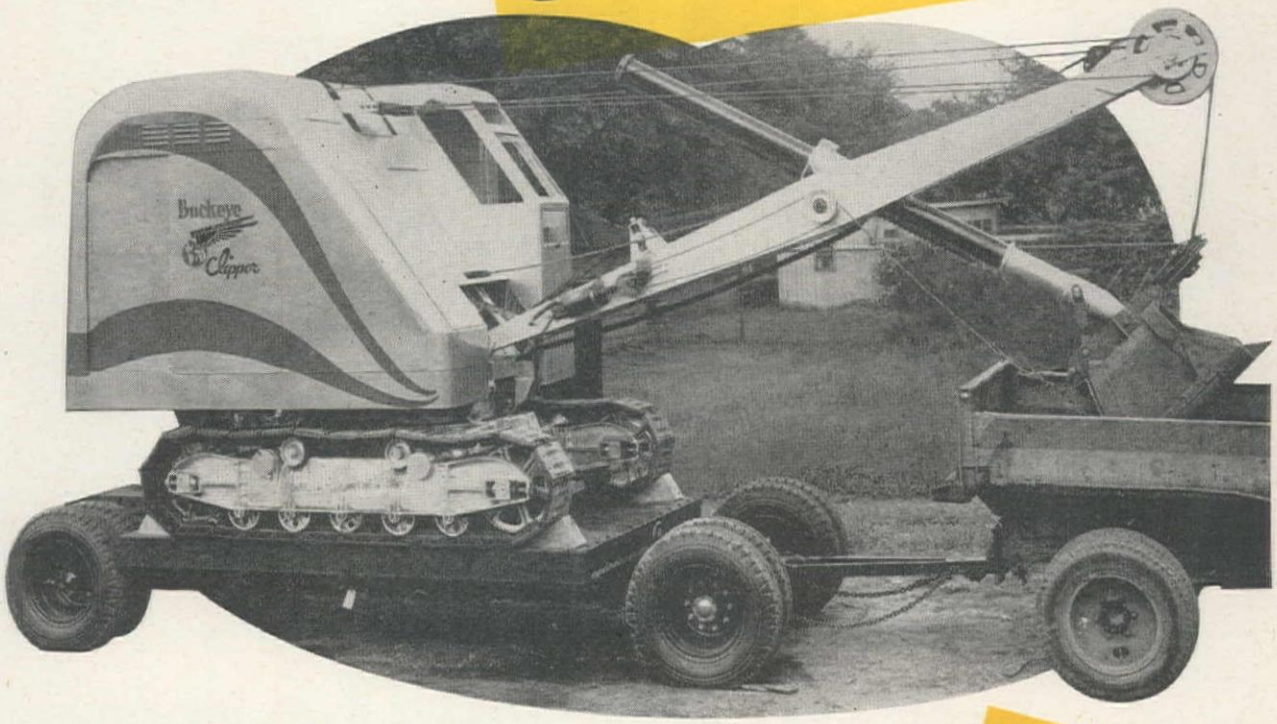
U.S. ROYAL TIRES

UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

tight corners

EASILY PORTABLE



THE BUCKEYE MODEL 70 CLIPPER IS A "SNAP" TO MOVE FROM JOB TO JOB

If you're looking for a smooth-working shovel that will wipe away your inter-job transportation frowns, sail along with the graceful Clipper. Think of a ¾-yd. shovel that you can load on a light trailer and haul behind a 1½-ton truck. That's the Buckeye Model 70 Clipper.

low clearance

Tops in portability, the Clipper also heads the list in convertibility. It's five machines in one... power shovel, trench hoe, dragline, crane, pile driver. From the ground up, Clippers are built for faster digging and material handling. All clutches are engaged and brakes applied by Mevac—smooth, vacuum power. Vacuum power trips the dipper, too.

light truck

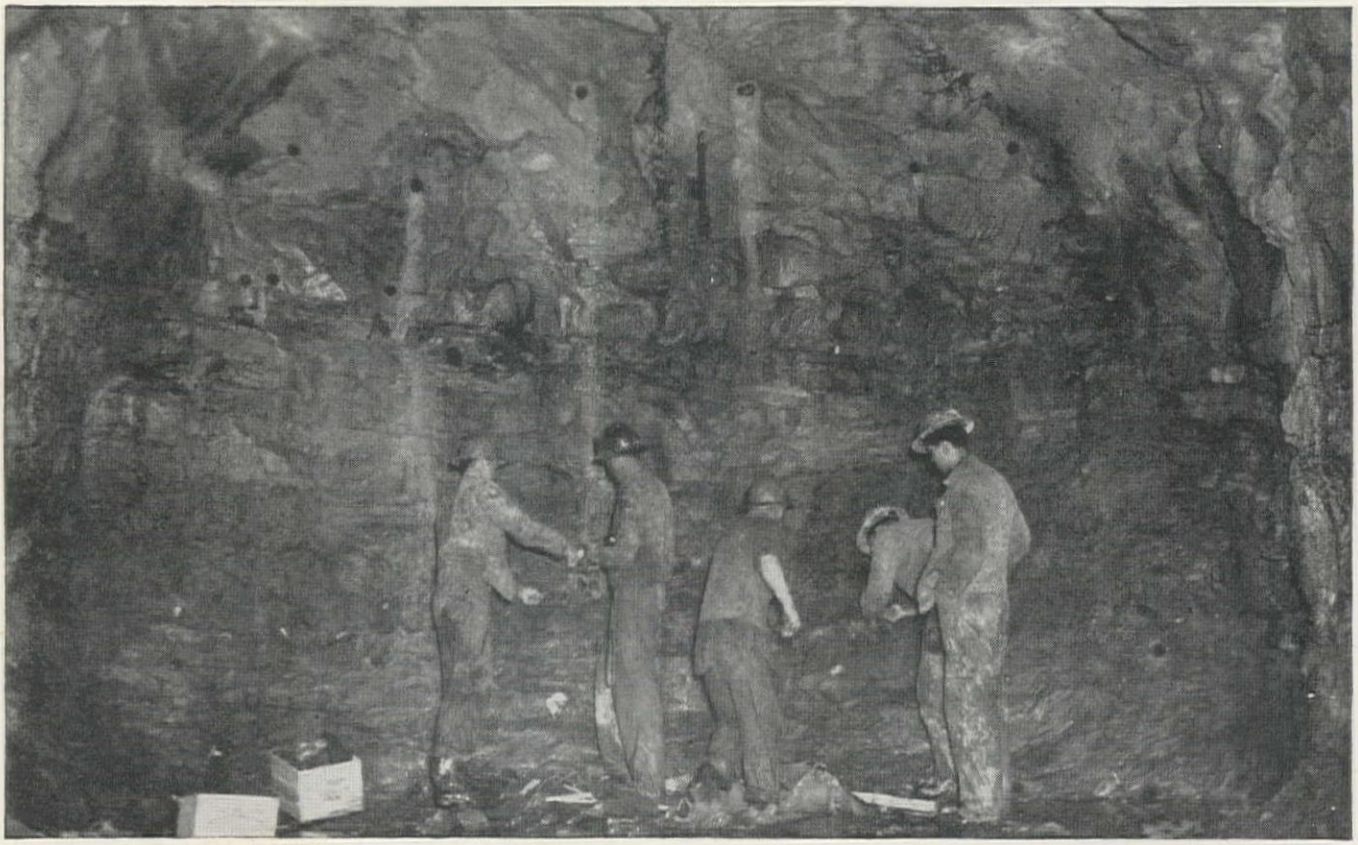
The Clipper has many other superior features—direct automotive drive, full revolving, simultaneous crowd, swing, hoist and travel—offered by no other small shovel. Let us show you the Clipper's many advantages. Stop in today!

INDUSTRIAL EQUIPMENT COMPANY

10911 RUSSET ST., OAKLAND 3, CALIF. • 4441 SANTA FE AVE., LOS ANGELES 11, CALIF.

• SAN DIEGO • FRESNO • SACRAMENTO •

Good breakage with "GELEX" helps keep tunnel job on schedule



In connection with the Conemaugh Dam project in western Pennsylvania, relocation of a rail line required driving a 2700-foot tunnel, 35 feet in diameter.

To do the job quickly, efficiently and on schedule, contractor Herman Holmes of Crystal Falls, Mich., relied upon Du Pont "Gelex" No. 2—the popular, semi-gelatinous dynamite. Three shifts on the job each worked a complete cycle of drilling, blasting and mucking . . . driving a total averaging 24 feet per day in the pilot tunnel.

The work was wet for the most part, and the water-resisting qualities of "Gelex" served the contractor well. Good breakage facilitated mucking . . . helped speed progress of the job and aided in keeping it on schedule.

"Gelex" is a powerful dynamite . . . suitable for many tunnel jobs. It is economical to use because it has higher stick count than the gelatin it replaces. Perforated cartridges eliminate slitting and headaches. Minimum fumes permit early return to the face.

Consider "Gelex" for every tunnel job . . . it may save you money. Your Du Pont Explosives Representative will gladly give you complete information about it. E. I. du Pont de Nemours & Co. (Inc.), Hoge Building, Seattle, Wash.—Old National Bank Bldg., Spokane, Wash.—Midland Savings Bldg., Denver, Colo.—111 Sutter Street, San Francisco, Calif.

(AT TOP)—"Jumbo" has been drawn back to allow crew to load pyramid-cut round in face of 16 x 18-foot pilot tunnel, later enlarged to 35-foot width.

(LOWER PHOTO)—Loading 1 ¼ x 8 inch "Gelex" cartridges. Note wet conditions. Du Pont Electric Blasting Caps and Delays were used.

DU PONT "GELEX"

A Product of Du Pont Explosives Research

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

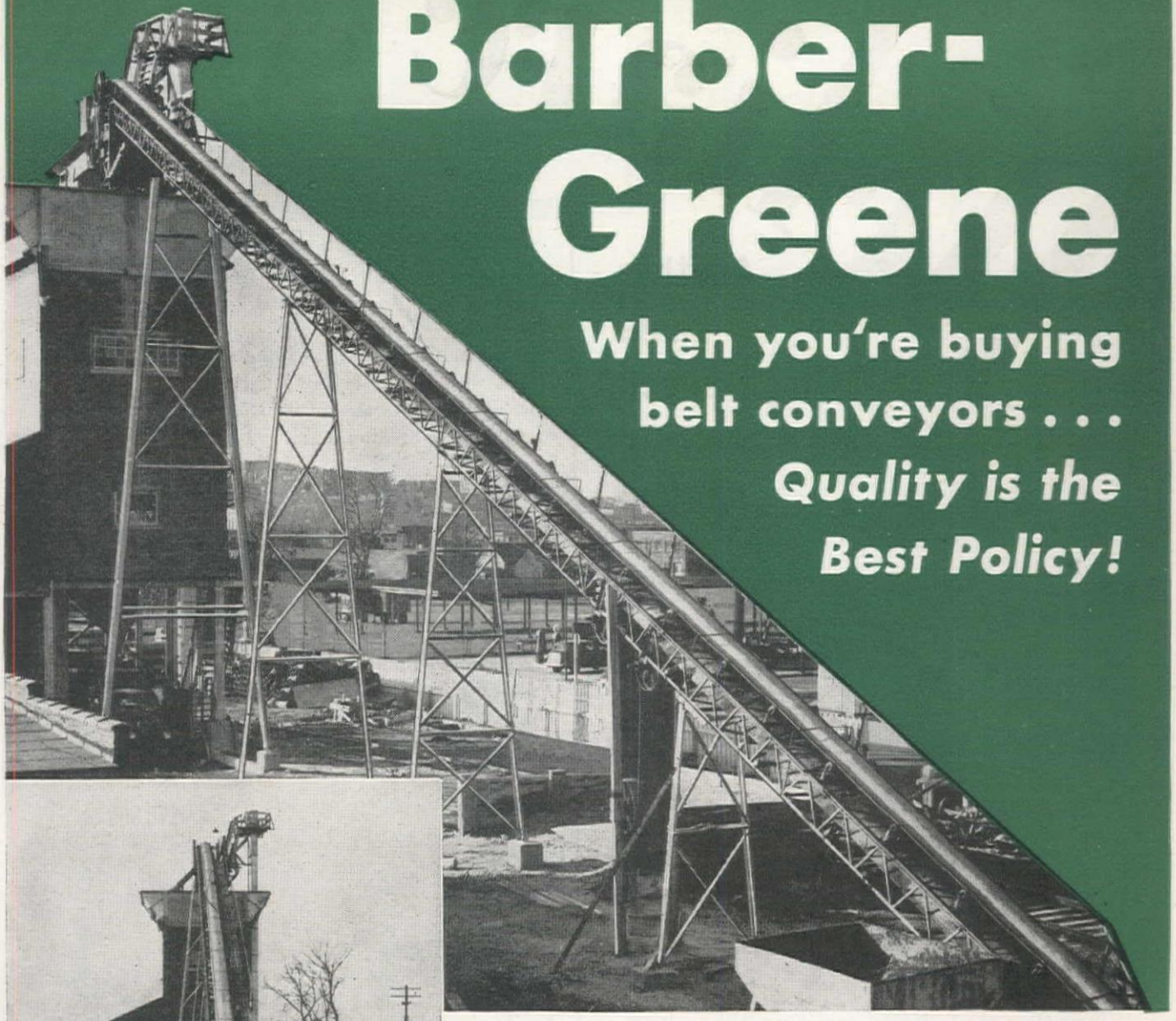
PROPERTIES OF "GELEX" COMPARED WITH SPECIAL GELATIN

	Bulk Strength	Stick Count*	Water-Resistance	Fumes
"GELEX" No. 1	60%	136	Good	Excellent
Special Gelatin	60%	123	Excellent	Excellent
"GELEX" No. 2	45%	150	Good	Excellent
Special Gelatin	40%	114	Excellent	Excellent

*Stick count based on 1 1-8 x 8 inch cartridges varies within limits of 3 per cent.

Barber-Greene

When you're buying belt conveyors . . . *Quality is the Best Policy!*



Belt Conveyors by Barber-Greene are examples of infinite attention to engineering detail. You see this from the minute they arrive: the plainly numbered carriers and support members, the easily followed erection print, the simplified assembly on the job that comes from their standardized design. The units themselves—carriers, trusses, walkways, drives and takeups—go still further in proving the value of belt conveyors that are quality engineered. They are designed to last through longer years of service. And they do just that—while moving bulk materials at a high production pace at a low cost per yard moved.

53

This B-G Belt Conveyor set-up makes efficient use of limited space: materials dumped into pits below tracks are carried to plant adjacent to spur.

BARBER-GREENE COMPANY · AURORA, ILLINOIS

Constant Flow Equipment

LOADERS PERMANENT CONVEYORS PORTABLE CONVEYORS COAL MACHINES BITUMINOUS PLANTS FINISHERS DITCHERS

Brown-Bevis Equipment Co., Los Angeles 41, Calif.; Brown-Bevis Equipment Co., Phoenix, Ariz.; Columbia Equipment Co., Spokane, Wash.; Columbia Equipment Co., Seattle, Wash.; Columbia Equipment Co., Boise, Idaho; Columbia Equipment Co., Portland 14, Ore.; Wilson Equipment & Supply Co., Cheyenne, Wyoming; Wilson Equipment & Supply Co., Casper, Wyoming; Contractors Equip. & Supply Co., Albuquerque, New Mexico; Ray Corson Machinery Co., Denver 2, Colorado; Jenison Machy. Co., San Francisco 7, Calif.; Western Construction Equipment Co., Billings, Montana; Western Construction Equipment Co., Missoula, Montana; Kimball Equipment Company, Salt Lake City 10, Utah.

Heliarc

Another Linde high-speed welding method

Mechanized speeds of 14 in. per min. were established in HELIARC welding rocket cases of 0.0625-in. to 0.125-in. 3S aluminum.

Production of 300 Aluminum Rocket Motor Cases Daily

Large Savings in Welding Aluminum Fruit Ship Ventilators

A shipbuilder found that by replacing metallic arc welding with HELIARC welding, he could reduce warping and cleaning, reduce overall welding time approximately 40 per cent. The ventilators were fabricated of 52 S-H, ¼-in. aluminum.

The high quality of the butt and fillet welds made in 0.065-in. silver coils with the HELIARC process extended their normal service life considerably.

Increased Life of Silver Coils Worth $70,000

Production of Stainless Steel Plates Increased Four-Fold

Hand-welding these heat exchanger plates of Type 302 stainless steel with the HELIARC process reduced cleanup time, decreased the number of "leakers," and increased production 300 per cent.

Typical of the many magnesium welding operations is the fabrication of aircraft seat end frames, made from six magnesium tubular parts. Complete operation of jigging and making all 32 welds in the structure by HELIARC welding required about 15 minutes.

Production of Four Magnesium Seat End Frames Hourly Per Man

Only Possible Process for Aircraft Magnesium Castings

HELIARC welding for hand-welding butt, lap, and fillet joints in small magnesium castings made possible the production of certain vital parts for aircraft radar equipment.

With the mechanized arrangement for making butt welds in 0.035-in. Type 306 stainless steel by the HELIARC process, a welding speed of 40 in. per min. was obtained. Units were welded at an average of 40 per hour, and savings of 27 per cent over the former method of production were realized on one order of 33,000 units.

$8,000 Savings in 33,000 Stainless Steel Stove Parts

CLEAN, SMOOTH JOINTS IN METALS THAT ARE DIFFICULT TO WELD BY OTHER METHODS

Linde's HELIARC process is a method of arc-welding in which the welding action is shielded by an inert gas—usually argon.

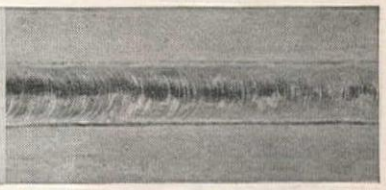
Joints welded by the HELIARC process have exceptionally high quality. They are clean, because HELIARC welding eliminates flux. Joints are so smooth, even, and neat that usually no finishing treatment of any kind is required.

Linde service engineers are always available to help with problems of treating, cutting, joining and forming metals.

Call or write any Linde office for more information.

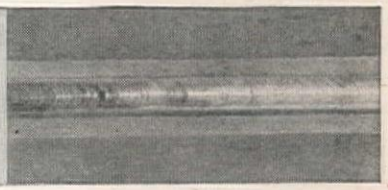
TYPICAL HELIARC WELDS

Aluminum 3S—0.5 in. thick, 2 passes at 10 in. per min. per pass.

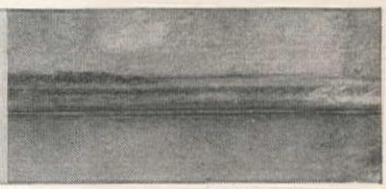


Aluminum 3S—2.5 in. thick, 32 passes at 4.2 in. per min. per pass.

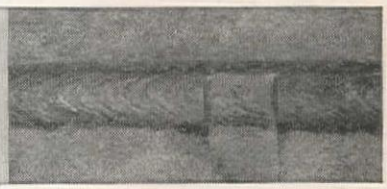
Aluminum 2S0—0.125 in. thick, 22 in. per min.



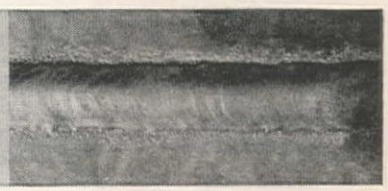
HASTELLOY Alloy B—0.050 in. thick, 24 in. per min.



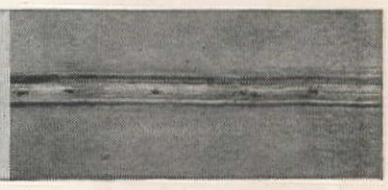
Cast Iron—0.375 in. thick, 8 in. per min.



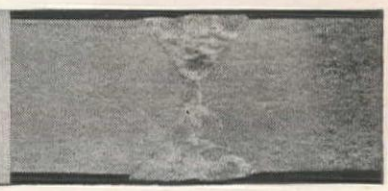
Magnesium—0.5 in. thick, 2 passes at 8 in. per min. per pass.



Stainless Steel, type 304—0.062 in. thick 24 in. per min.



Aluminum3S—1.25in. thick, 10 passes at 12 in. per min. per pass.



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—

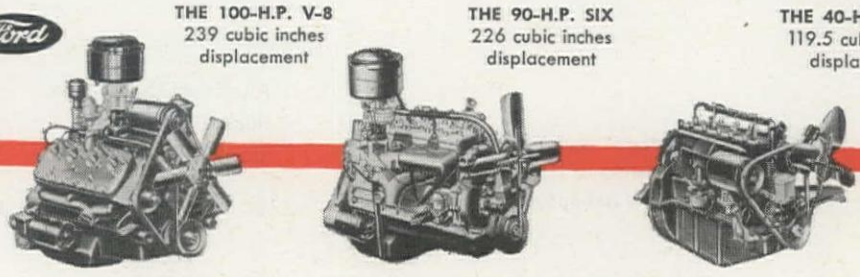
FORD MOTOR COMPANY
Industrial and Marine Engine Department
3515 SCHAEFER ROAD, DEARBORN, MICHIGAN

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



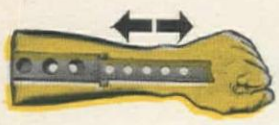
FORD-BUILT ENGINES

FOR INDUSTRIAL AND MARINE POWER

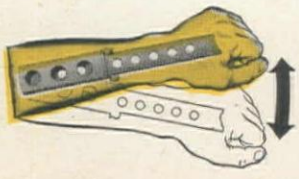
Announcing...THE

GRADALL
"Arm Action"
FOR SPEED AND DEXTERITY

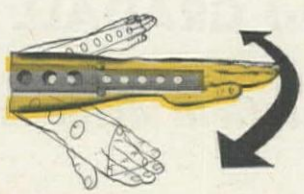
A unique, new application of hydraulic power gives the telescopic boom of the Gradall armlike agility for fast action.



IN AND OUT BOOM The Gradall's 12' boom extends hydraulically to 24' by means of an inner boom.

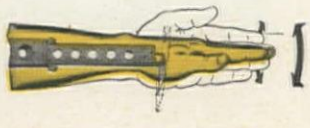


UP AND DOWN BOOM. The boom of the Gradall can be raised 22° to a dumping height of 14'10", or lowered 44° to a digging depth of 10'.



FULL 360° BOOM SWING A well-balanced platform with smooth revolving action permits a full 360° boom swing.

TOOL CONTROL. Tools can be held in any position through a vertical arc of 116°. Tools are quickly interchangeable.



TILTING BOOM. The Gradall boom can be tilted 45° each way from horizontal, permitting precision slope and contour grading.

GRĀDALL

THE NEW *Multi-Purpose* CONSTRUCTION MACHINE

NEW, RADICALLY DIFFERENT DESIGN makes Gradall the most outstanding modern development in construction equipment. Five-year field tests of pilot models on actual pay jobs have shown amazing results in money savings and efficient operation.

VERSATILE. The new Gradall handles a wide variety of work both on and off the road. Gradall operates the year round on jobs such as:

- ★ TRENCH DIGGING
- ★ HIGHWAY WIDENING
- ★ BASEMENT EXCAVATING
- ★ RIPPING AND LOADING OLD PAVEMENT
- ★ DITCH CLEANING
- ★ SLOPING AND GRADING
- ★ BACK FILLING
- ★ SNOW REMOVAL AND LOADING

DEXTEROUS. Gradall "Arm Action" gives dexterity to the telescopic boom which reaches and pulls, swings and tilts—working right up against curbs and walls, around poles and trees, under low hanging wires, and in many other close quarters.

ACCURATE. Gradall works with unheard of precision—cuts sheer, perpendicular walls or perfectly graded slopes—produces the neatest finished jobs you ever saw to eliminate or minimize costly clean-up hand labor.

DESIGNED BY A CONTRACTOR, engineered and built by makers of precision equipment, Gradalls are being produced as fast as possible, because results have proved them to be money-makers for contractors—money-savers for street and highway departments.

LESS THAN 15 MINUTES TO CHANGE ATTACHMENTS!
A variety of standard and special tools are quickly interchangeable by simply loosening two hex nuts and withdrawing a pin.

GRĀDALL DIVISION
WARNER & SWASEY COMPANY
CLEVELAND

FREE BOOKLET
illustrates the many uses of Gradall, gives dimensions, ranges and mechanical specifications.

Send coupon now for your copy.

THE WARNER & SWASEY COMPANY
Cleveland 3, Ohio

Please send the new GRADALL Book to:

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City .....

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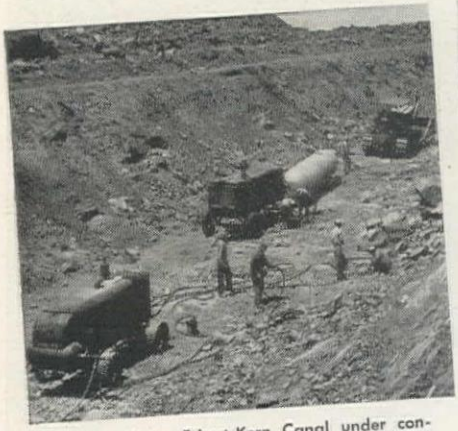
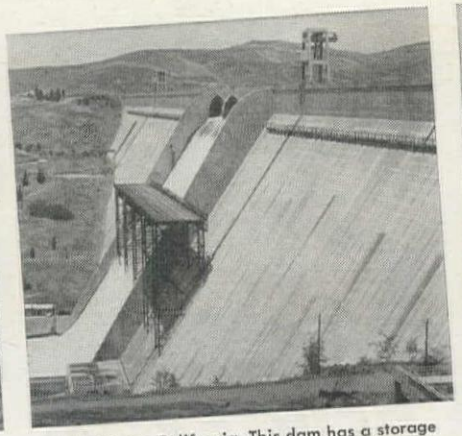


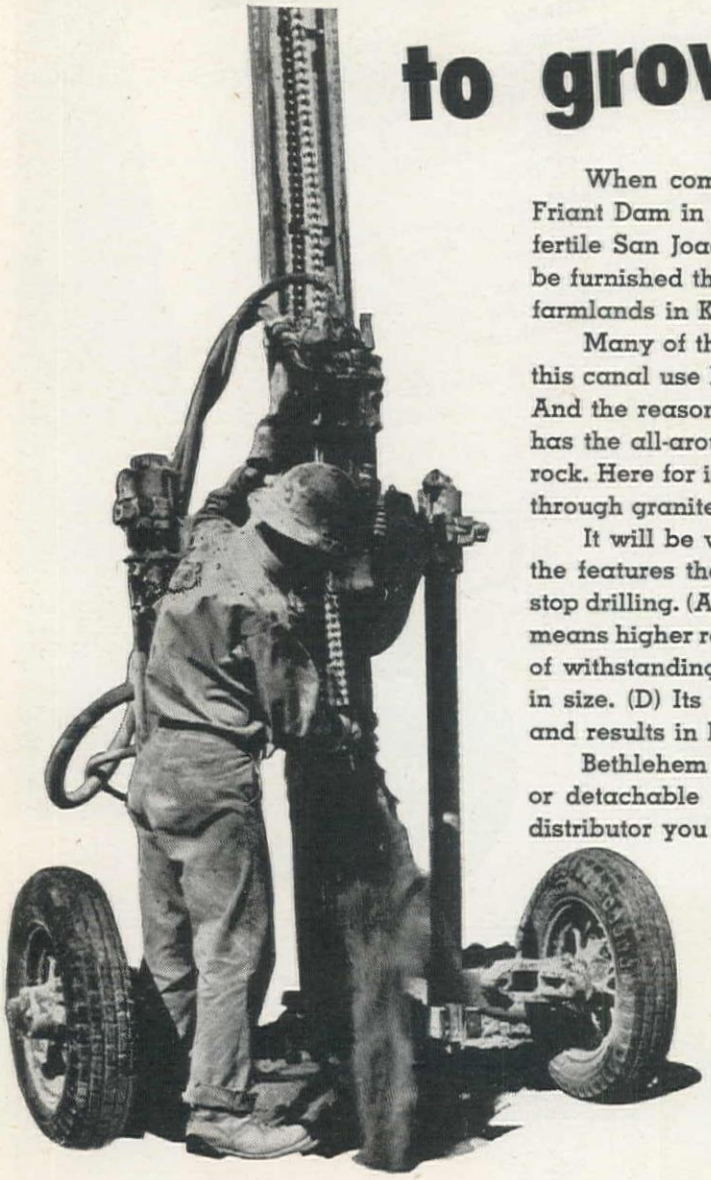
Section of the Friant-Kern Canal under construction by Peter Kiewit Sons' Company. Bethlehem Hollow Drill Steel is used here.



Friant Dam, California. This dam has a storage capacity of 450,000 acre-feet of water. It regulates the run-off from 1,631 square miles.

Little Dry Creek siphon on the Friant-Kern Canal under construction by Bechtel Brothers McCone Company. Bethlehem Hollow is used.

Drilling through granite to grow more grapes



When completed the Friant-Kern Canal will carry water from Friant Dam in the Sierra Nevada foothills through 160 miles of the fertile San Joaquin Valley southward to Bakersfield. Irrigation will be furnished thousands of acres of highly-productive vineyards and farmlands in Kings, Tulare and Kern counties.

Many of the contractors now working on the various sections of this canal use Bethlehem Hollow Drill Steel as standard equipment. And the reason they've standardized on Bethlehem Hollow is that it has the all-around stamina needed for rapid drilling through tough rock. Here for instance it has been necessary to drill some line holes through granite to a depth of 24 feet.

It will be well worth any contractor's time to consider a few of the features that make Bethlehem Hollow a natural for tough, non-stop drilling. (A) It has a true round, smooth, well centered hole which means higher resistance to fatigue. (B) It forms a tough shank capable of withstanding heavy battering. (C) It is always true and uniform in size. (D) Its wide quenching range makes it easier to heat-treat and results in better hardness . . . longer life.

Bethlehem Hollow is equally suitable for use with forged-on bits or detachable bits. When you order your next drill steel tell your distributor you want Bethlehem Hollow.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

General Offices: San Francisco

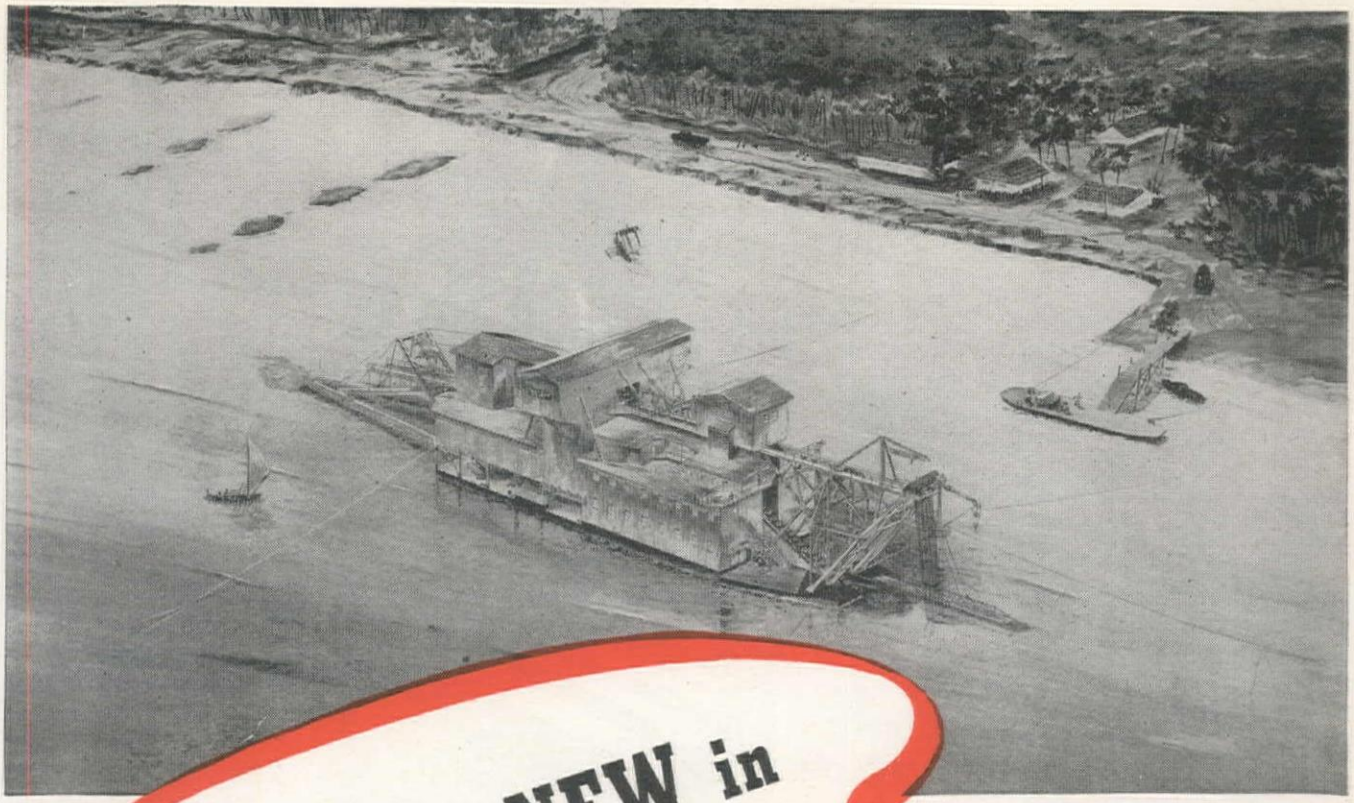
District Offices: Los Angeles, Portland, Seattle, Salt Lake City, Honolulu

Steel Plants: Los Angeles, South San Francisco, Seattle

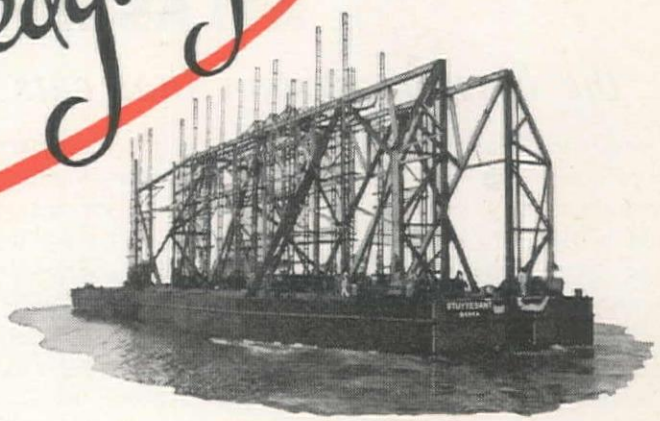
BETHLEHEM PACIFIC

BETHLEHEM STEEL

BETHLEHEM HOLLOW DRILL STEEL



Something NEW in Placer Dredging



WITH a displacement of over 4000 tons and hull length of 246 feet, the "Stuyvesant," one of two identical units now being built by Bucyrus-Erie for tin mining service off the Netherlands East Indies isle of Banka, is the largest placer dredge ever to be built in the United States.

But it is the "Stuyvesant's" design, not its size, which is of most significance to placer mining. Typical of its "years ahead" engineering is the widespread use of Ward-Leonard variable-voltage control, permitting variations of speed and power in digging and maneuvering to suit the variable operating conditions always encountered. Use of this control eliminates many factors which limit output in fixed-speed operation by putting power to work in the amount and kind required. With power so metered, the "Stuyvesant's" 216-foot digging ladder with its string of 148 14-cubic foot buckets, with both deck- and ladder-mounted idlers, can supply the 128-cell all-jig washing plant at the varying optimum rate for highest overall efficiency.

This application of Ward-Leonard control to placer dredging concretely illustrates Bucyrus-Erie's ability to draw on both specialized experience and a wide general background in designing and building placer dredging equipment. In taking your dredging problems to Bucyrus-Erie, you look to the only dredge manufacturer who has the advantage of experience gained not only in 66 years of building placer dredges but in the same number of years devoted to producing almost every type of excavating and earthmoving equipment for both dryland and underwater operation.

12047C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

Would You Attempt a Blast Here?

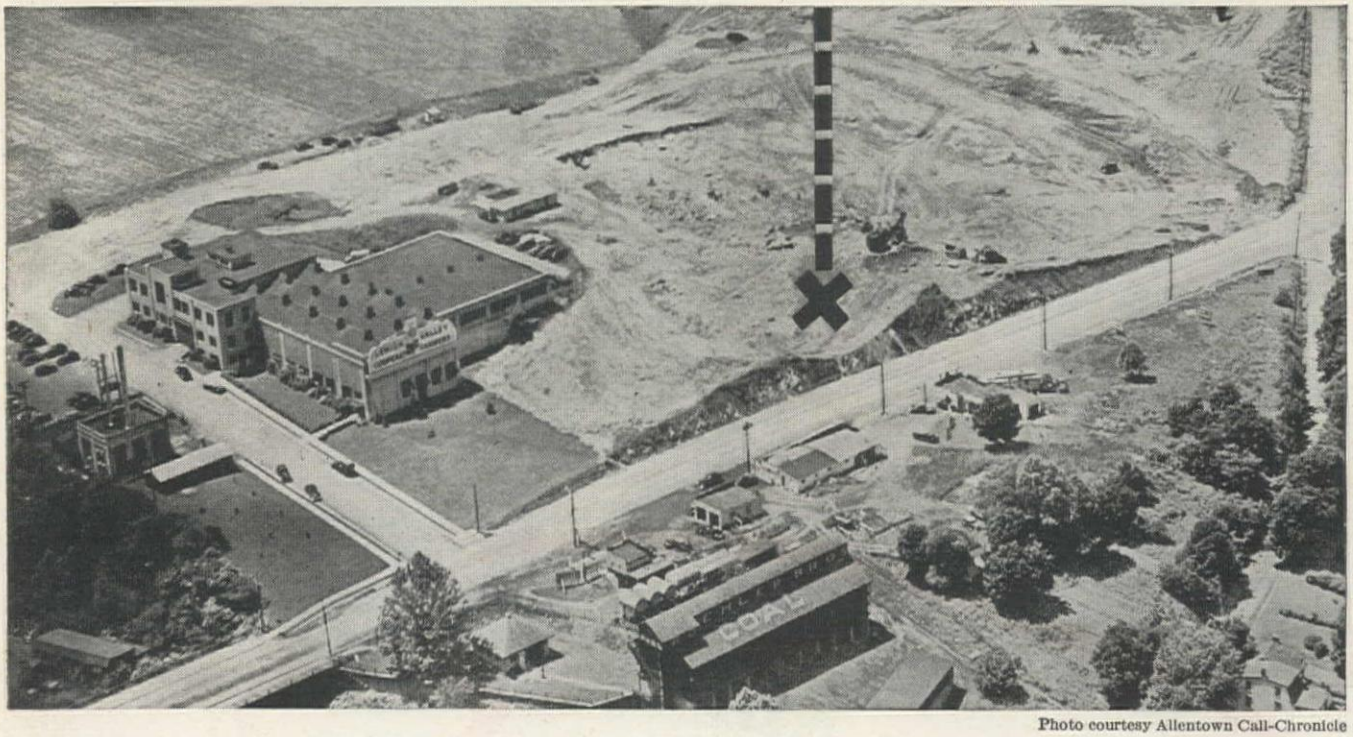


Photo courtesy Allentown Call-Chronicle

You Bet You Would! – If You Used

ATLAS ROCKMASTER

the blasting system that cuts down noise and vibration

Using the Atlas Rockmaster system, highly successful blasting was done within a stone's throw of offices, stores, and houses, two hotels, a schoolhouse and a state highway—and without any serious complaint.

That's because Rockmaster usually cuts down considerably on noise and vibration, even when more holes are shot! Many actual reports show that dynamite charges do not need to be cut down because of proximity to houses when Rockmaster is properly used. And that means money saved. Shovels are kept working. Rock is well broken without so much secondary blasting.

The blasting project in the photo was at the very city limits of Allentown, Pa., where land was being cleared for new buildings of the Lehigh Valley Cooperative Farmers. 25,000 cubic yards of rock was blasted here by R. F. Sell, excavation contractor of Bethlehem, Pa.

There's only one way to find out whether Rockmaster can do the same for you as it is doing for blasters the country over—in construction, quarries, coal stripping and metal mining. Call in the Atlas representative and see for yourself.

With our knowledge of explosives and your knowledge of your own problems, chances are that Rockmaster can help step up your shovel efficiency—cut down objectionable noise and vibration.

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

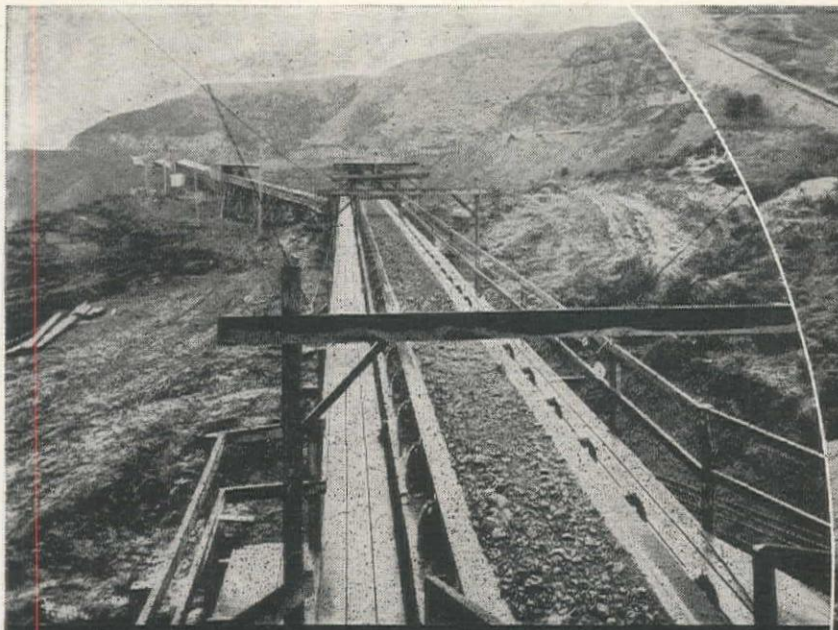
Offices in Principal Cities

ATLAS EXPLOSIVES

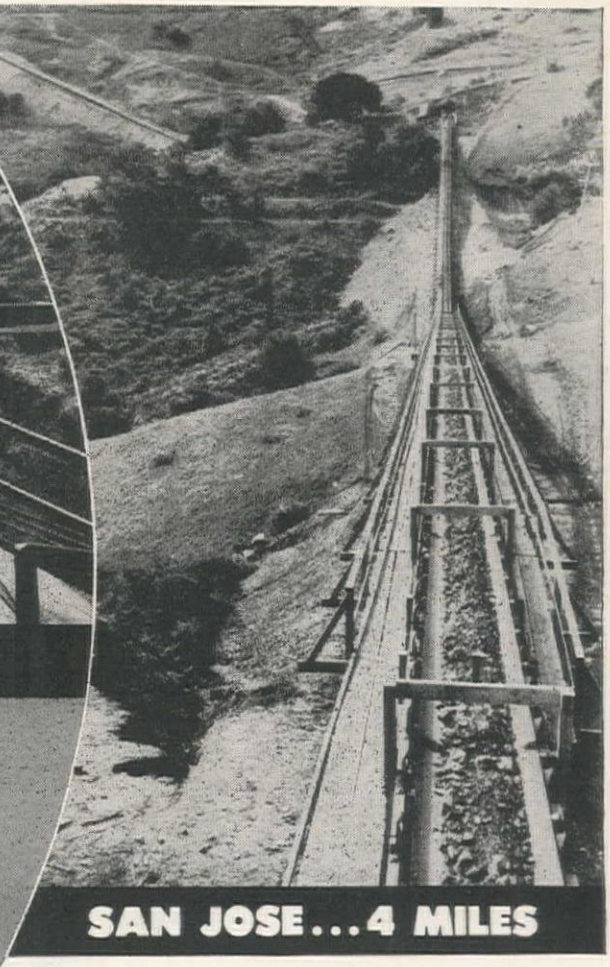
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

SAN FRANCISCO 4, CAL. ATLAS POWDER COMPANY SEATTLE 1, WASH.

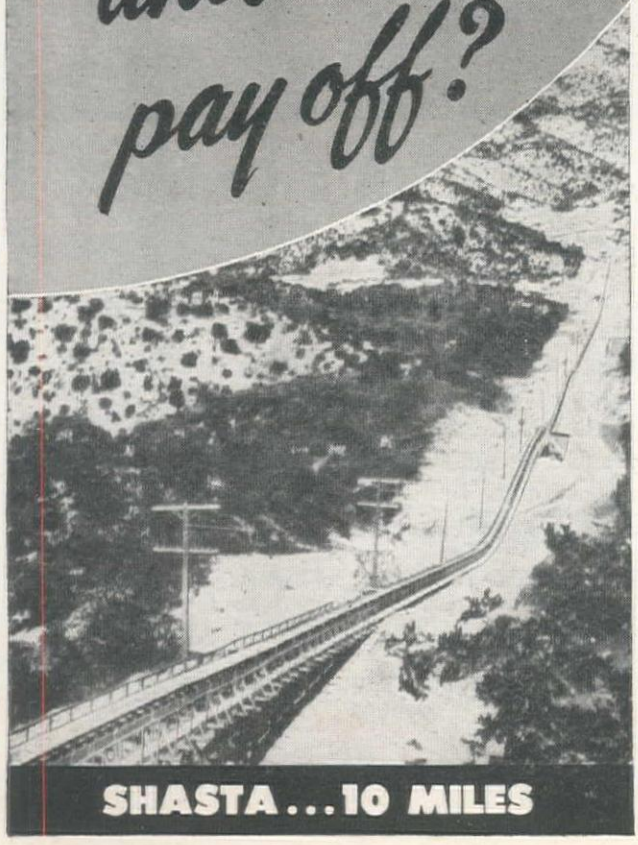


GRAND COULEE...2 MILES



SAN JOSE...4 MILES

HOW LONG CAN A CONVEYOR BE . . *and still pay off?*



SHASTA...10 MILES

On large construction projects, conveyors have long been the accepted tool for moving bulk materials in a continuous flow over short and medium distances . . . but how about relatively long hauls? Based on present data, 30 to 50 miles is probably the economic limit—one conveyor now under consideration would be 38 miles long, and there is every reason to believe that conveyor lengths may reach 50 miles in the near future.

Regardless of the length to which conveyors may grow, their electrification will not be a limiting factor. One-point electric control for the entire conveyor system is now possible, as well as electrical interlocking to prevent piling-up of material at flight junctions. On downhill runs, conveyor drive motors can function as generators and pump power back into the line . . . one conveyor system actually generated more power than it consumed, once it was placed in motion.

Conveyors are just one of many electrified construction tools on which General Electric engineers are working in co-operation with equipment manufacturers and contractors to speed construction and keep initial, operating, and maintenance costs at a minimum. Ask your G-E representative how electrification of your construction equipment can help you make a better product at lower cost. *General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

655-57-162

What's missing in this picture?

Thousands of dollars for this Crane —*but it can't work!*

● This crane erected on the job cost $41,000. But it can't do a nickel's worth of work until rigged with wire rope costing a fraction of that amount.

The wire rope used makes a big difference, yet for this job Preformed Wire Rope of Improved Plow Steel . . . the best there is . . . costs only about $300. Preformed permits faster, better work, with fewer shutdowns.

Management likes Preformed because it lasts longer. Workmen like it because it's easier and safer to handle. Get the most out of your machines by specifying Preformed of Improved Plow Steel.

PREFORMED WIRE ROPE

SEND FOR FREE COPY of informative book about Preformed. Address: Preformed Wire Rope Information Bureau, 520 N. Michigan Ave., Chicago 11.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

WIRE ROPE HANDLES EASIER - LASTS LONGER

INTERNATIONAL Diesel Crawlers

Your Best Bet for EXCAVATING

You can see for yourself in these photographs how the International TD-14 with a bulldozer blade gets on with a basement digging job. Here the average distance from cut to spoil was 60 feet, depth to dig was 6 feet, yardage dug was 420 cubic yards of clay. Total time required was 6½ hours.

Enough said when you say, "It's an International Diesel Crawler!"

Equipped with a bulldozer blade, it's your best bet for digging basements and other excavations.

With an International Diesel, whole blocks of basements can be dug in one operation—and economically. Then the same crawler can be used to spread the spoil and fill in between foundations or to push it over ramps into trucks for removal. And it can finish the job by building streets and landscaping the whole area.

No wonder many contractors who specialize in basement digging prefer the International Diesel Crawler.

Greatly favored for this work is the International TD-14 because its size is within limits which permit ready transportation on the streets and highways of most municipalities and states. Yet it is a powerful, fast working crawler, fit for your toughest assignments.

Ask the International Industrial Power Distributor near you to supply specifications and complete information about this and other International Crawlers, Wheel Tractors, Power Units and matched equipment.

Industrial Power Division

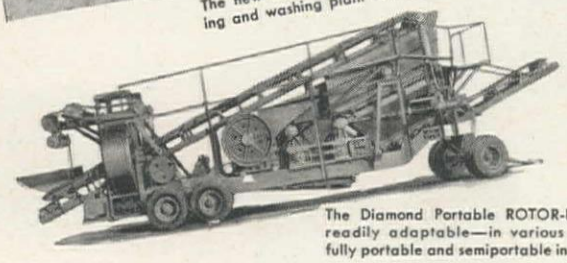
INTERNATIONAL HARVESTER COMPANY

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

INTERNATIONAL INTERNATIONAL HARVESTER **Industrial Power**

DIAMOND **DYNAMICS** *in action*

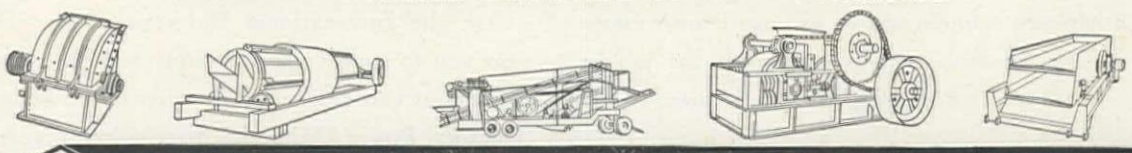
The new Diamond-equipped, gravel crushing, screening and washing plant of King Brothers, Dayton, Ohio.



The Diamond Portable ROTOR-LIFT Plant, readily adaptable—in various sizes—to fully portable and semiportable installations.

• • • Producing crushed gravel economically at or near the site of a job is one of the tough problems construction engineers have to lick. That's where the *portability* of the Diamond Rotor-Lift gravel crushing and screening plant can save time and cut haulage costs. Here in a completely *portable* plant, is all equipment needed to process gravel from its raw state to the exact size needed for the job . . . and as close to the job site as possible! Learn how Diamond Dynamics can work for you. Call your Diamond dealer today!

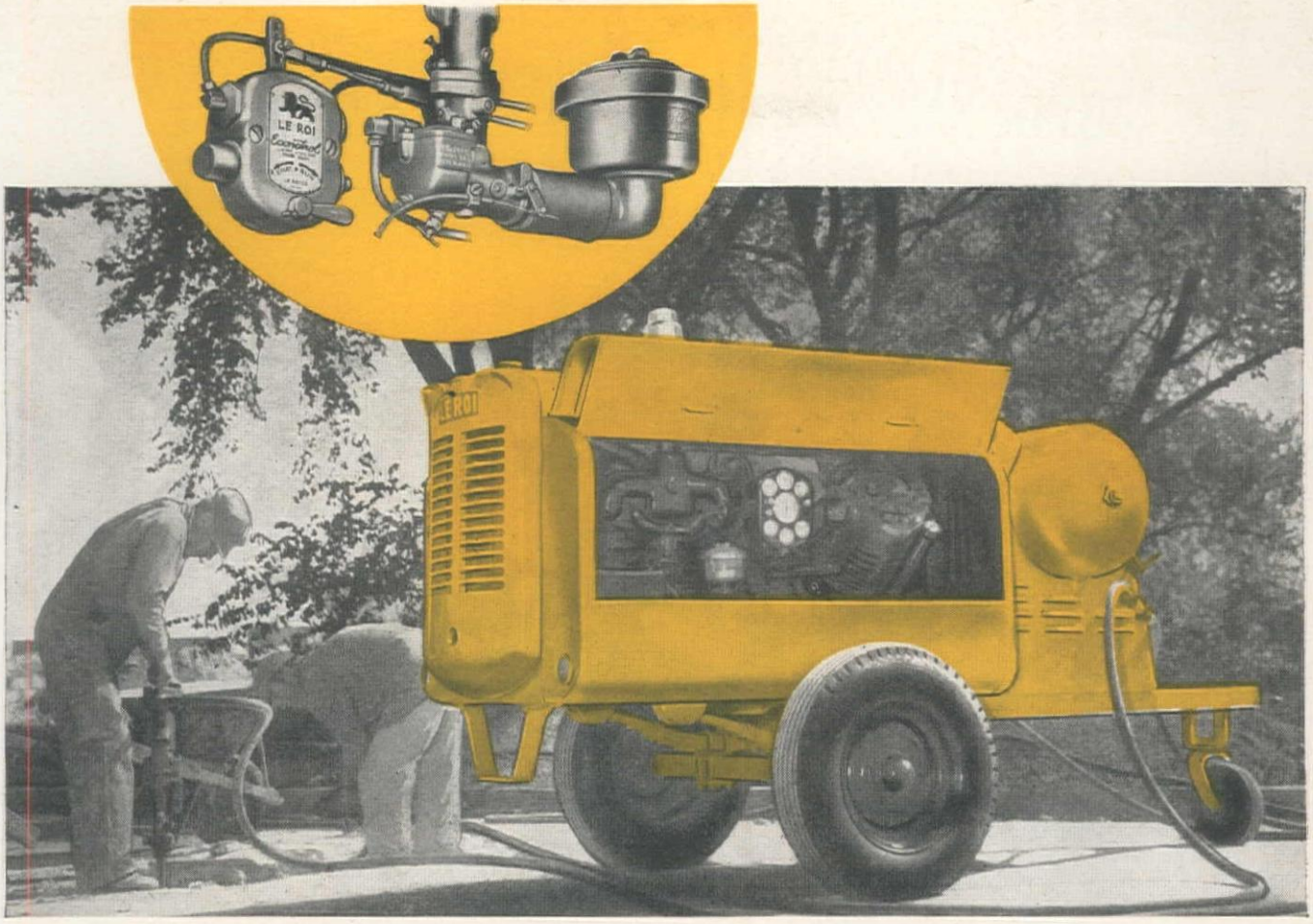
"THERE'S NOTHING TOUGHER THAN A DIAMOND"



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

YOUR NEAREST DIAMOND DEALER FOR SALES AND SERVICE

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



Everything's under control

Le Roi
Heavy-duty engine

Le Roi
Engine-generator set

Le Roi
*105 Tractair**

Le Roi-
Centaur Mower

–air pressure, fuel consumption, costs–when you use a dependable LE ROI AIRMASTER

Like the champions they are, Le Roi AIRMASTERS pace themselves to the requirements of the job. There is no sprinting at top speed and then a period of idling along. Instead, through use of the amazing, patented, fuel-saving Econotrol, engine speed is adjusted to the demand for air. Doing away with rapid acceleration and deceleration, in this manner, increases endurance — lengthens life — lowers fuel consumption — reduces costs.

Man-hour production is increased, too. The Econotrol* maintains higher average working pressures, forcing air tools to do more work. And in the size range from 60 to 500 cfm, there is the right AIRMASTER for your needs.

Put an Econotrol-equipped AIRMASTER on your job — watch your costs go down. Then, like other AIRMASTER users, you too can say "everything's under control." See your nearby Le Roi distributor. He can show you in a few minutes why an AIRMASTER* is — Portable Air Power at its Best.

LE ROI COMPANY
MILWAUKEE 14, WISCONSIN

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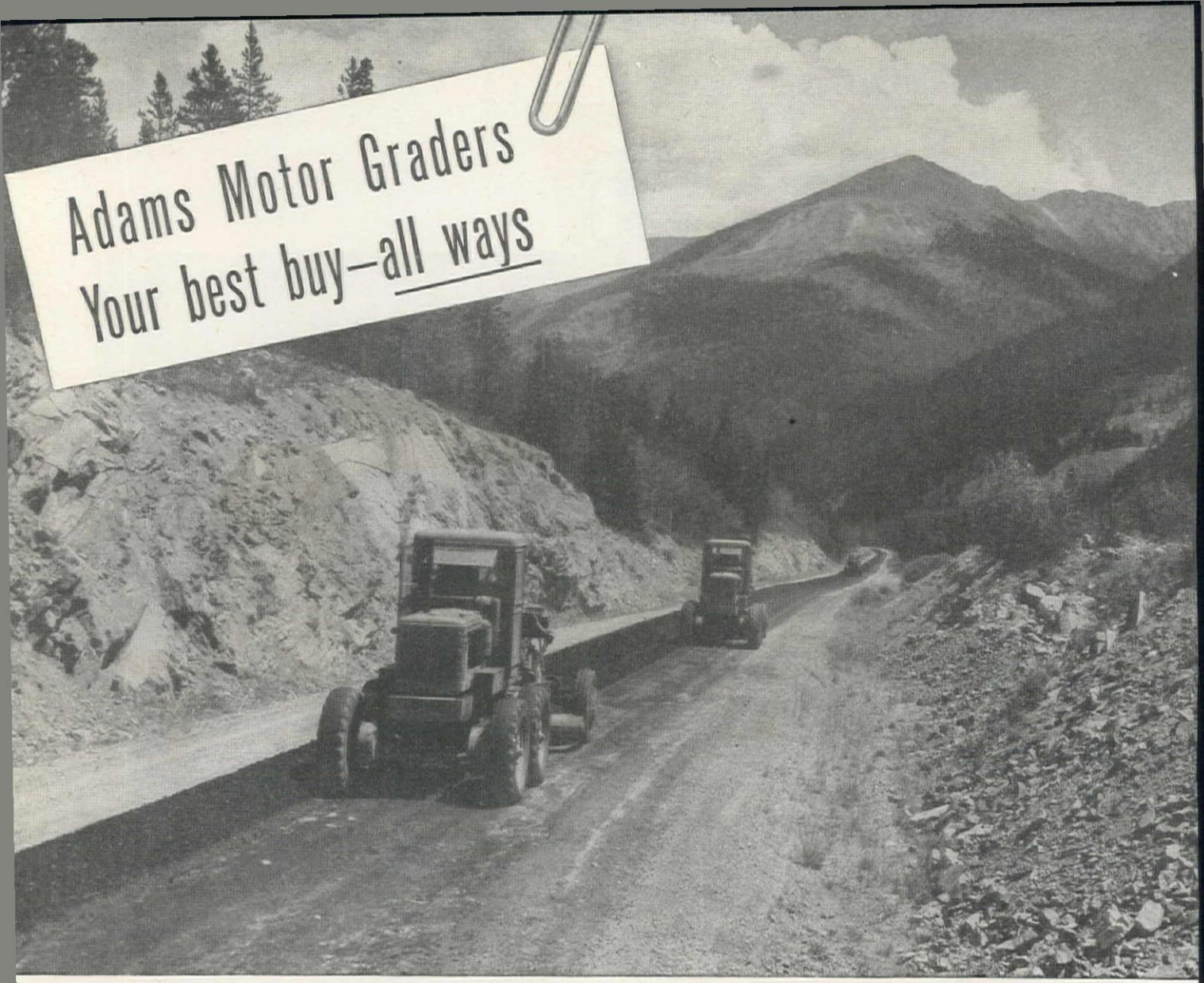
LE ROI MILWAUKEE

*Reg. U. S. Pat. Off.

C-110



8 Forward Speeds

SAVE TRAVEL TIME • SPEED OPERATIONS • CUT JOB COSTS

REGARDLESS of the type work you are doing—ditch cutting, bank cutting, blading, scarifying, aggregate mixing, spreading—Adams' 8 overlapping forward speeds provide instantly the right speed for doing the job at the fastest practical rate.

This means *more efficient work—more work per day—more profitable operation.* And Adams' high transport speeds (up to 21 m.p.h.) importantly reduce costly, non-productive travel time to jobs and between jobs.

Visit your local Adams dealer. He'll show you how and why Adams Motor Graders are *your best buy—in this way—and all ways.*

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

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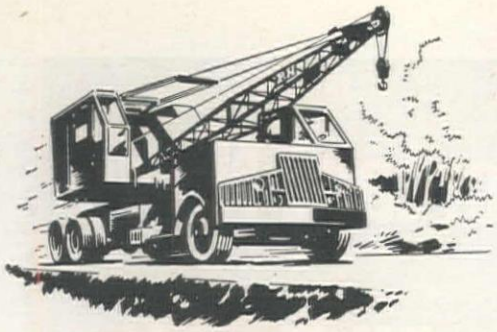
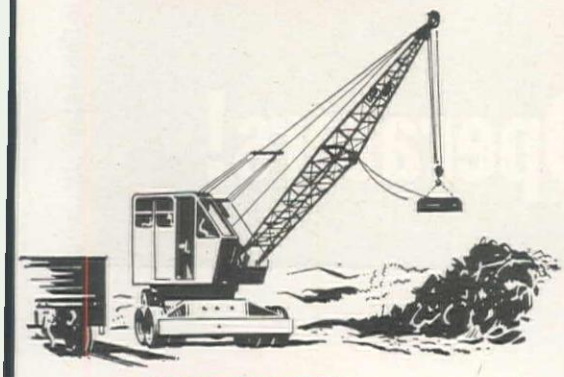


ONE ENGINE
FOR *TRAVEL*...



ANOTHER
FOR WORK...

Size for size, no P&H Truck Crane has ever been outlifted

P&H TRUCK CRANES

have the *Winning Combination*

You Can't Lose With Dual Power!

WHEN YOU TRAVEL, you travel at regular traffic speeds—with an engine built for travel alone. No time lost between jobs.

WHEN YOU WORK — whether it's crane, dragline, or shovel, you operate with another engine — the right power for unhampered load handling ability.

On the road or on the job, P&H dual power Truck Cranes have the exact requirements for faster, easier performance at lower operating costs.

P&H *Added Values*

- Hydraulic control — a new peak in operating ease and safety.
- Greater stability — with exclusive torsion bar-mounted front axle and lower center of gravity.
- Independent Planetary boom hoist — raises or lowers boom smoothly and safely, with or without load.
- Planetary load lowering—permits "inching" of loads, accurately.
- All-welded construction — greater strength. Weave-proof frame eliminates sway at boom point.

P&H REMOTE CONTROL AVAILABLE

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

HARNISCHFEGER CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS (P&H) HOISTS • WELDING ELECTRODES • MOTORS

HARNISCHFEGER CORPORATION: MILWAUKEE 14, Wisconsin, 4490 West National Avenue
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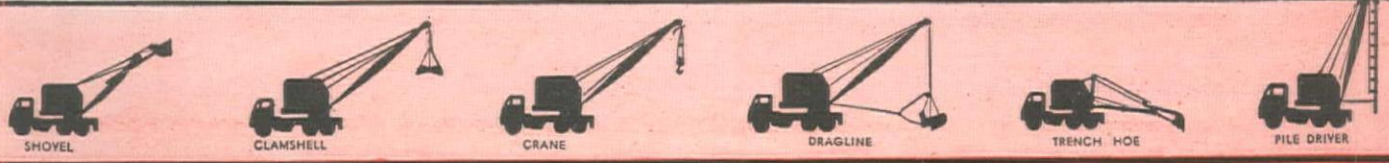
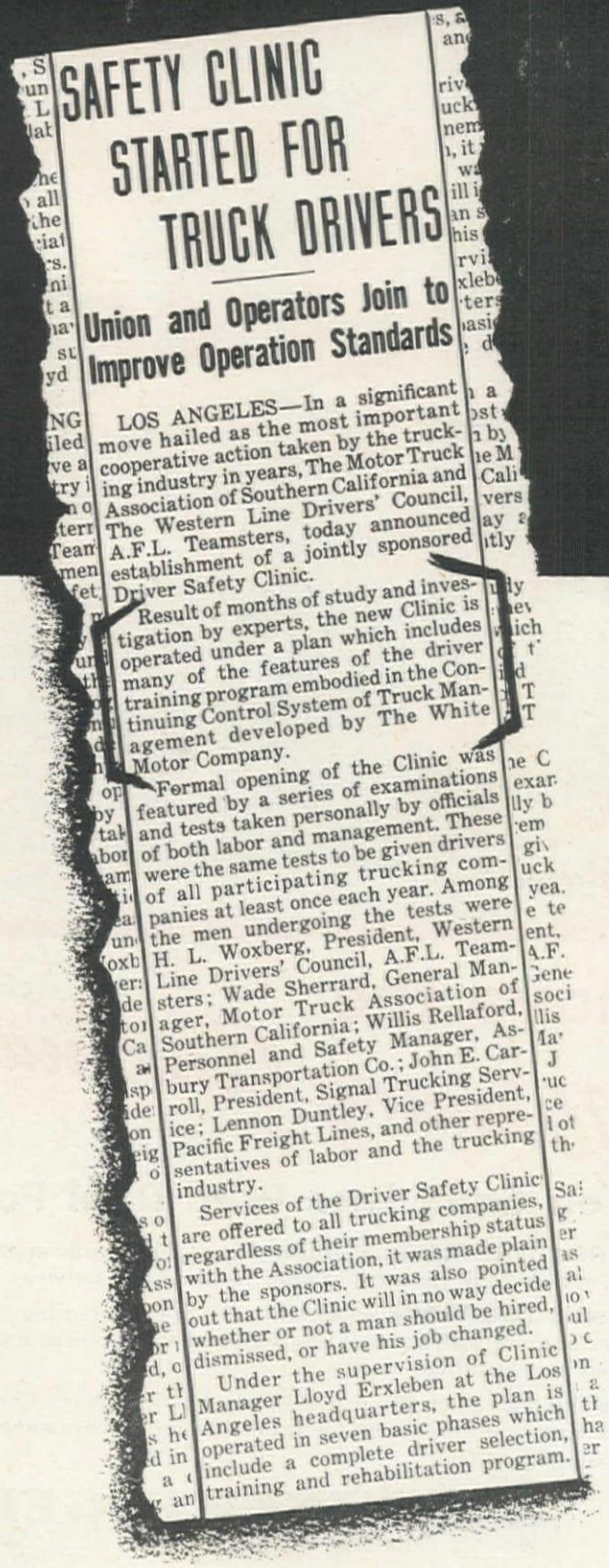
PORTLAND, Oregon, Loggers & Contractors Machinery Co., 240 S. E. Clay St.; **WILLOWS, Calif.,** Willows Motor Sales Co.; **BAKERSFIELD, Calif.,** Kern Tractor & Equipment Co., 24th & N. 99 Highway, P. O. Box 1695; **NAPA, Calif.,** Berglund Tractor & Equipment Co., 1016-18 Soscol Ave.; **SALT LAKE CITY, Utah,** National Equipment Co., 101 West Second St., So.; **BOISE, Idaho,** Olson Manufacturing Company, 2223 Fairview Ave.; **EL CENTRO, Calif.,** Faure Tractor & Equipment Company, 1414 Main St.; **FRESNO, Calif.,** Brown Tractor Co., 1824 Santa Clara St.; **SAN DIEGO, Calif.,** Southern Equipment & Supply Co., 668 Third Ave.; **SPOKANE, Wash.,** F. M. Viles & Co., East 124 Trent Ave.; **NORTH SACRAMENTO, Calif.,** Capitol Tractor & Equip. Co., 1001 Del Paso Blvd.; **RENO, Nevada,** Dennison Tractor & Supply Company, 559 East Fourth St.; **SEATTLE, Wash.,** Glenn Carrington & Co., 91 Columbia Street.





SAFETY CLINIC STARTED FOR TRUCK DRIVERS

Union and Operators Join to Improve Operation Standards

LOS ANGELES—In a significant move hailed as the most important cooperative action taken by the trucking industry in years, The Motor Truck Association of Southern California and The Western Line Drivers' Council, A.F.L. Teamsters, today announced establishment of a jointly sponsored Driver Safety Clinic.

Result of months of study and investigation by experts, the new Clinic is operated under a plan which includes many of the features of the driver training program embodied in the Continuing Control System of Truck Management developed by The White Motor Company.

Formal opening of the Clinic was featured by a series of examinations and tests taken personally by officials of both labor and management. These were the same tests to be given drivers of all participating trucking companies at least once each year. Among the men undergoing the tests were H. L. Woxberg, President, Western Line Drivers' Council, A.F.L. Teamsters; Wade Sherrard, General Manager, Motor Truck Association of Southern California; Willis Rellaford, Personnel and Safety Manager, Asbury Transportation Co.; John E. Carroll, President, Signal Trucking Service; Lennon Duntley, Vice President, Pacific Freight Lines, and other representatives of labor and the trucking industry.

Services of the Driver Safety Clinic are offered to all trucking companies, regardless of their membership status with the Association, it was made plain by the sponsors. It was also pointed out that the Clinic will in no way decide whether or not a man should be hired, dismissed, or have his job changed.

Under the supervision of Clinic Manager Lloyd Erxleben at the Los Angeles headquarters, the plan is operated in seven basic phases which include a complete driver selection, training and rehabilitation program.

Important News For All Truck Operators!

Further evidence of growing appreciation by the trucking industry of The White Motor Company's *Continuing Control System of Truck Management* is furnished by important news such as the accompanying story announces.

In setting up the Driver Safety Clinic its sponsors were unanimous in selecting most of the features of the driver training plan as detailed under the third factor of the White system. Specific tests developed by White to gauge drivers' traffic and driving knowledge were adopted intact by the Clinic.

Write today to your local White headquarters for information applying the entire system to your own operation.

THE WHITE MOTOR COMPANY • CLEVELAND

Pacific Coast Branches and Dealers in all the important cities

White

FOR MORE THAN 45 YEARS THE GREATEST NAME IN TRUCKS

FWD..THE TRUCK FOR HEAVY DUTY

Why do FWD four-wheel-drive and six-wheel-drive trucks remain first choice of highway construction and maintenance men? Simply because no other type of truck equals the performance of FWDs in the MANY heavy-duty road jobs every FWD can do. See your nearest Distributor about the ONE TRUCK for MANY JOBS, or write to . . .

THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis.
Canadian Factory: Kitchener, Ontario

FWD

America's Foremost Heavy-Duty Truck

FWD Distributors: ARIZONA—Arizona-Cedar Rapids Co., 401 N. First St., Phoenix; CALIFORNIA—The Four Wheel Drive Auto Co., 1339 Santa Fe Ave., Los Angeles 21, and FWD Pacific Co., 469 Bryant St., San Francisco 7; COLORADO—Liberty Trucks & Parts Co., P. O. Box 1889, Denver 1; IDAHO—Intermountain Equipment Company, Broadway at Myrtle St., Boise; MONTANA—Steffeck Equipment Co., 11 E. Cutler St., Helena; NEVADA—Allied Equipment Co., Reno; NEW MEXICO—The Myers Company, Las Cruces; OKLAHOMA—Halliburton Oil Well Cementing Co., P. O. Drawer 471, Duncan; OREGON—Feenaughty Machinery Co., 112 S.E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th So., Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 6th Ave., So. Seattle 2, Glenn Carrington & Co., 91 Columbia St., Seattle, and Feenaughty Machinery Co., 715 N. Division St., Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne; ALASKA—Glenn Carrington & Co., Nome, Fairbanks, Anchorage.

BAKER

still tops in PERFORMANCE!

Baker, pioneer builders of Bulldozers, have consistently maintained their leadership in the earth moving industry. There is no substitute for this experience — the engineering knowledge — the manufacturing skill which results in better on-the-job performance.

That is why Baker Bulldozers consistently out-perform anything on tracks—why Bakers are first choice of experienced users, why operators prefer Baker to any other make.

Built specifically for Allis-Chalmers Tractors to match their speed, balance, power and weight, Baker Cable or Hydraulic Bulldozers and Gradebuilders apply full tractor power to the blade — deliver maximum yardage per shift — provide longer useful service — important reasons why there are more Baker Bulldozers on Allis-Chalmers Tractors than all others combined.

BAKER MFG. CO. • Springfield, Ill.

BAKER

BAKER They Go Together! A-C

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

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

SALE!

LAST DAY

APRIL 30

TNT

ALL YOU WANT FOR ONLY 7 cents per pound!

Immediate Inspection! Immediate Delivery!

Here is a real opportunity to cut your blasting costs to the bone! WAA is releasing at once its entire stock of easy to store TNT for immediate sale. To get this low price* you need only purchase 30 50-lb. boxes. Easy to handle, stable to store (even under freezing conditions) TNT can be used in all processes where 40 to 60% Dynamite is employed except underground operation. Offers to purchase may be made by letter, wire or personal visit to any of the Regional Offices listed. If your offer is written, mark your envelope "Offer to purchase Trinitrotoluene A-56-2040".

* $.07 per lb., f. o. b. location in crystals, flakes and 1-lb. blocks; $.08 per lb., f. o. b. location in ½ lb. blocks; packaged in 50-lb. wooden or fibre boxes. Also available #10 & 12 blasting caps (required for TNT) and primacord.

DETAILED SALE INFORMATION

This material is offered, as is, subject to inspection by purchaser at location, without expressed or implied warranty except as to title. WAA reserves the right to reject any or all offers, to make awards in whole or in part, or to extend the period of sale. All items subject to prior withdrawal.

Purchasers of TNT are required to observe all applicable laws regulating the sale, use, handling and storage of explosive materials.

10% has been reserved to fill needs of Federal agencies received by April 30th. All other orders received by this date will be filled in following sequence: (a) Veterans of World War II; (b) All other priorities; and (c) Commercial purchasers. Purchaser's order must state thereon: (a) "This order is subject to WAA Standard Conditions of Sale, and all other advertised terms and conditions, and no other terms and conditions shall be binding on War Assets Administration"; and (b) Type of business and level of trade.

WAA OFFICE	½ LB. BLOCKS	1 LB. BLOCKS	CRYSTALS	FLAKES
Birmingham	—	360,039	—	—
Chicago	—	1,225,931	—	—
Cincinnati	28,045	3,544,245	67,500	98,443
Dallas	—	787,020	—	—
Denver	1,247,000	483,841	—	—
Fort Douglas	6,207	6,237,200	—	—
Los Angeles	1,000	966,350	—	—
Minneapolis	209,400	1,485,400	—	—
Nashville	1,751,100	—	—	—
New York	—	178,906	—	—
Omaha	1,068,050	1,848,550	14,250	—
Philadelphia	—	1,212,962	95,950	—
Portland	28,556	2,001,574	—	—
San Francisco	2,053,305	93,060	—	—
	6,392,663	20,425,078	177,700	98,443

OFFICE OF GENERAL DISPOSAL

WAR ASSETS ADMINISTRATION

GOVERNMENT WAA SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland Dallas • Denver • Detroit • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Omaha • Philadelphia Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Tulsa

1033-A

An Appetite for Bigger BITES!

The new ML 4 Athey MobiLoader is designed for digging — a sturdily-built unit that gets bigger loads Its new heavy-duty digging bucket, fast, "Finger-Tip" hydraulic control, new better balanced "Caterpillar" Diesel Tractor mounting, all add up to bigger production and easier operation on your digging and loading jobs.

Athey MobiLoaders employ the time-saving overhead method of loading. They cut time by travelling in a straightline from digging to discharging. They eliminate turning, save tractor wear and reduce maintenance costs.

Only the quality-built Athey MobiLoader gives so many profitable advantages. It's the time-proved, modern answer to your tractor-loader operations.

Your Athey-"Caterpillar" Dealer will gladly tell you more about the money-saving Athey MobiLoader See him today, or write direct to ATHEY PRODUCTS CORPORATION, 5631 West 65th Street, Chicago 38, Illinois.

Athey APCOR Products

"Finger-Tip" Control
A NEW ATHEY Feature

"Finger-Tip" Control — A convenient lever gives operator complete and accurate command over the movement of the heavy-duty bucket. Easier operation, bigger production.

Athey ML4 MOBILOADER

Need a BIG Truck ?

You can get immediate delivery on these 20-yard dump trucks

Huge payloads move when these tremendous Kenworth Model 888 dump trucks come on the job. With a gross capacity of 106,000 pounds, these giants have a 20-yard water level, rock type body to move out ore, dirt or rocks.

Design features of the new Kenworth Model 888 include: a twin cylinder telescopic hoist with a dumping angle of 50 degrees; an off-set cab for better driver visibility; the Knuckey dual chain drive bogey; either a 295 horsepower Hall-Scott gasoline or Hercules 214 horsepower diesel engine. Power steering is optional. Standard tires are 14.00 x 24, with 16.00 x 24 tires optional on the rear wheels.

Order now for immediate delivery. Wire or telephone Kenworth Motor Truck Corporation, Seattle 11, Washington, for the name of your nearest Kenworth distributor.

KENWORTH

TRUCKS ★ BUSES

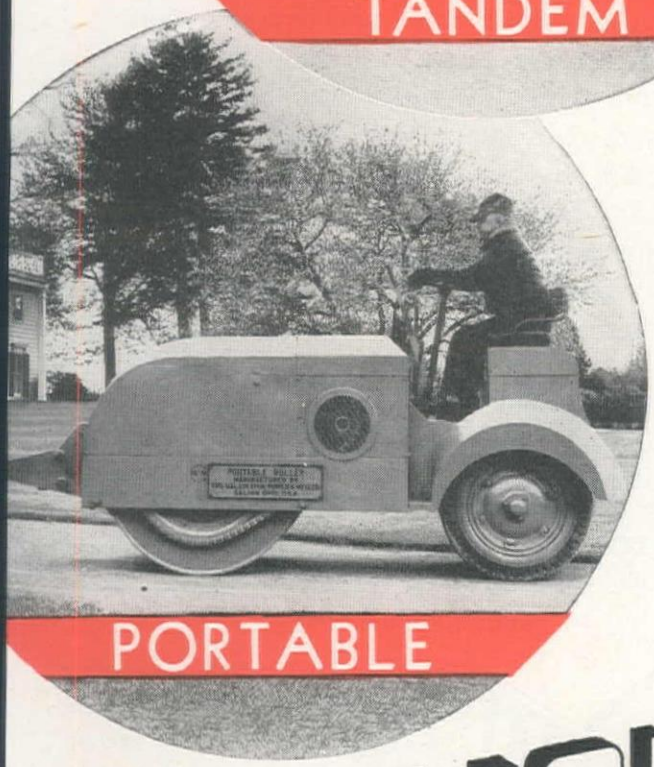
FACTORY AND HOME OFFICE: SEATTLE • *DISTRIBUTORS IN* PRINCIPAL WESTERN CITIES AND HAWAII

ON ANY ROLLING JOB

You're ahead with a GALION

THREE WHEEL

TANDEM



PORTABLE

For Primary Compaction

The Galion Three-Wheel Model will fill every need for a general purpose roller. Especially effective on early construction work such as compacting fills, and both rough and fine rolling.

For Finished Compaction

The Galion Variable Weight Tandem is highly efficient for rolling finished surface materials such as hot mix, asphalt, etc. This variable weight roller offers the important advantages of reduced roller investment and maintenance.

For Patching and Odd Jobs

A new and improved Variable Weight Galion Portable Model—exceptionally compact, yet has the compression effectiveness of a 5-7 ton tandem roller. Very economical and efficient for rolling all kinds of patch material and compacting loose materials on drives, streets, alleys, roads, airports, etc. Easily and quickly transported.

See your nearest GALION Distributor for complete information.

The GALION IRON WORKS & MFG. CO.
General and Export Sales Offices
Galion, Ohio, U.S.A.

GALION DISTRIBUTORS

ARIZONA:
Phoenix.....Brown-Bevis Equipment Co.
Tucson.....F. Ronstadt Hardware Co.

CALIFORNIA:
Los Angeles 11....Brown-Bevis Equip. Co.
San Francisco.....Western Traction Co.

COLORADO:
Denver 1.....H. W. Moore Equipment Co.

IDAHO:
Boise.....Nelson Equipment Co.

MONTANA:
Butte.....Hall-Perry Machinery Co.

NEVADA:
Reno.....General Equipment Co.

NEW MEXICO:
Las Vegas....Las Vegas Truck & Equip. Co.

OREGON:
Portland 14.....Nelson Equipment Co.

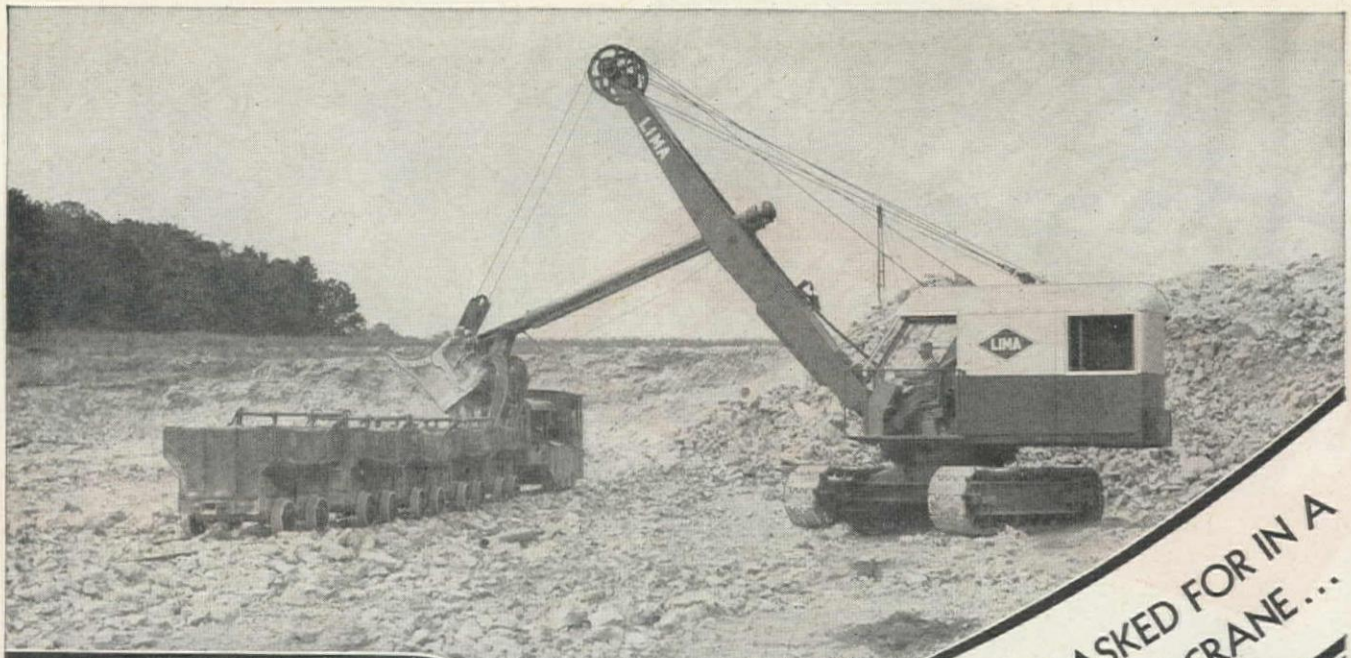
UTAH:
Salt Lake City 1.....Arnold Machinery Co.

WASHINGTON:
Seattle 14.....Nelson Equipment Co.
Spokane.....Nelson Equipment Co.

GALION IRON WORKS

hydraulic

GRADERS · ROLLERS



THE NEW LIMA type 604

EVERYTHING THAT COULD BE ASKED FOR IN A 1½ CUBIC YARD SHOVEL OR 30 TON CRANE...

"PRECISION" AIR CONTROL
ANTI-FRICTION BEARINGS
INDEPENDENT CHAIN CROWD
ONE-PIECE WELDED FRAME
FOLDING GANTRY FRAME
WELDED STEEL SHOVEL BOOM
TUBULAR DIPPER HANDLE
ROLLER CHAIN POWER TAKE-OFF
CONVERTIBLE FRONT ENDS
INDEPENDENT BOOM HOIST
HOOK ROLLERS
CENTRAL LUBRICATION
MODERN STREAMLINED CAB

The LIMA Type 604 is a brand-new convertible shovel, crane and dragline that brings to the user everything that could be asked for in a 1½ cubic yard shovel or a crane of 30 tons capacity. Tested under actual job conditions – this great new LIMA has proved that it has the same superior quality, unrivalled ruggedness and great power that characterize all LIMA shovels, cranes and draglines. Its modern, up-to-the-minute design embodies numerous advantages and refinements that contribute to lower operating costs and peak performance throughout a long and profitable life. Yes, you will agree that the Type 604 was worth waiting for. Write today for a copy of bulletin 64.

LIMA LOCOMOTIVE WORKS, INCORPORATED
Shovel and Crane Division LIMA, OHIO, U. S. A.

OFFICES IN PRINCIPAL CITIES

LIMA SHOVELS CRANES DRAGLINES

Capacities
Shovels ¾ Yd. to 5½ Yds.
Cranes 13 Tons to 100 Tons
Draglines Variable

LIMA

THE LIMA DIAMOND
FOR 75 YEARS AN EMBLEM OF QUALITY WORKMANSHIP

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

Chiloquin, Oregon, Job of R. A. Heintz Construction Company, Portland, Oregon

—with a fleet of Wooldridge Terra-Cobras

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

Working on a 7.5 mile stretch of a new 40 mile highway, which will by-pass the crooked snowy Sun Mountain grade, just North of Fort Klamath, Oregon, Wooldridge Terra-Cobras are handling full loads of volcanic boulders, decomposed lava and cinder soil on an 8 minute round-trip cycle, over a distance of 6400 feet. 40 to 60 seconds loading and 30 seconds spreading in distances up to 100 feet contribute to consistent and continuous speed of haul—down and back a 3% grade. Ample traction and power plus positive two-wheel steering insures sure-footed travel at maximum speed every inch of the way. Flexibility of travel and effortless control saves equipment and operator fatigue. To figure on lower yardage costs, figure on using Wooldridge Terra-Cobras. Investigate fully today.

Measure Each Job in terms of WOOLDRIDGE EQUIPMENT:

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

WOOLDRIDGE MANUFACTURING CO.
SUNNYVALE, CALIFORNIA
NATIONWIDE SERVICE

WOOLDRIDGE

TERRA COBRA

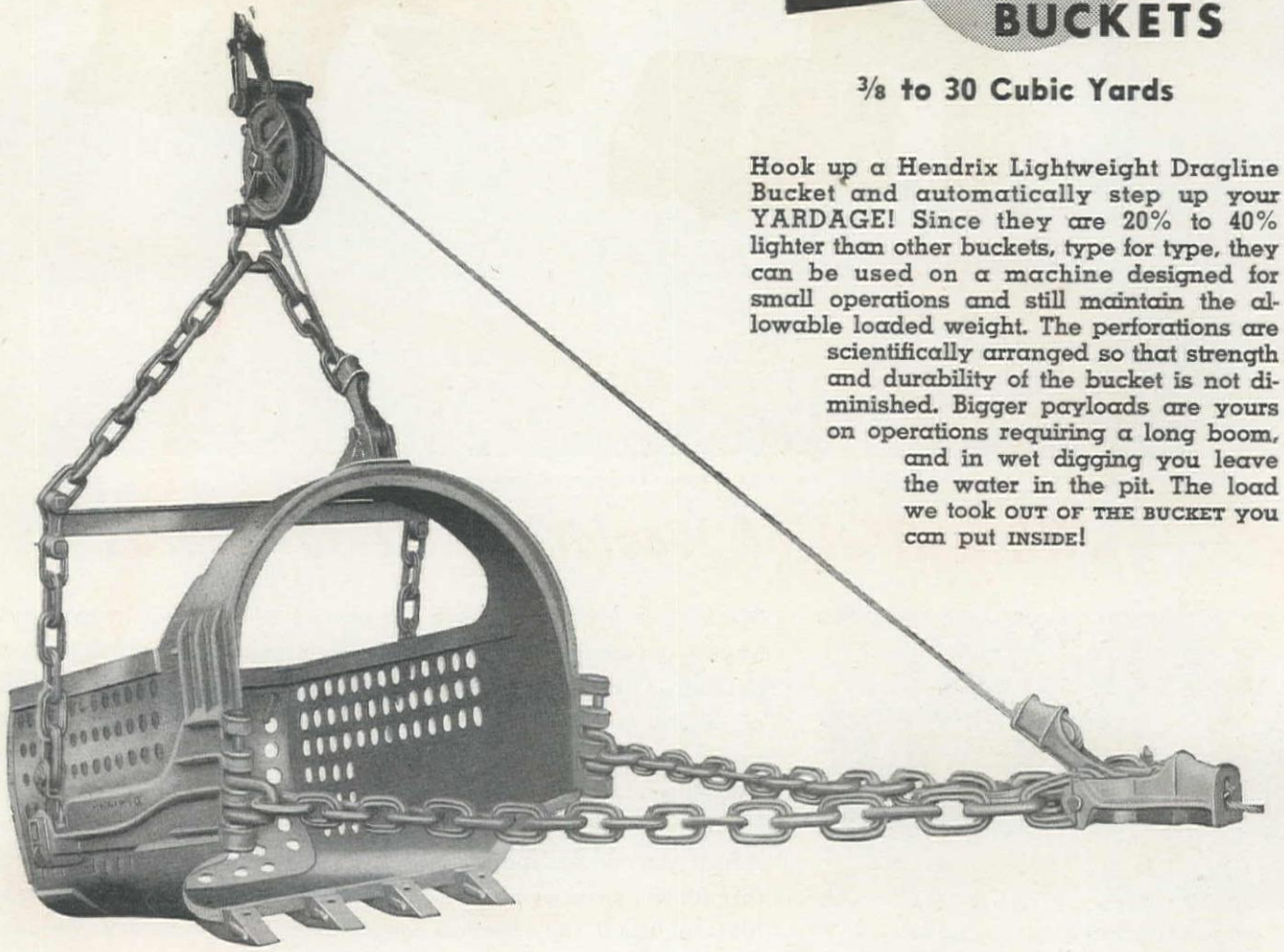
HIGH SPEED-SELF PROPELLED

EARTHMOVERS

Durable WITH A CAPITAL "DO"

HENDRIX Lightweight DRAGLINE BUCKETS

3/8 to 30 Cubic Yards



Hook up a Hendrix Lightweight Dragline Bucket and automatically step 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. The perforations are scientifically arranged so that strength and durability of the bucket is not diminished. Bigger payloads are yours on operations requiring a long boom, and in wet digging you leave the water in the pit. The load we took OUT OF THE BUCKET you can put INSIDE!

WHY HENDRIX BUCKETS ARE YOUR BEST BET

- ★ **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.**

Write for descriptive literature—or ask your dealer

HENDRIX MANUFACTURING COMPANY
MANSFIELD INCORPORATED LOUISIANA

FORMERLY DESOTO FOUNDRY, INC.

CUMMINS *Dependable* DIESELS

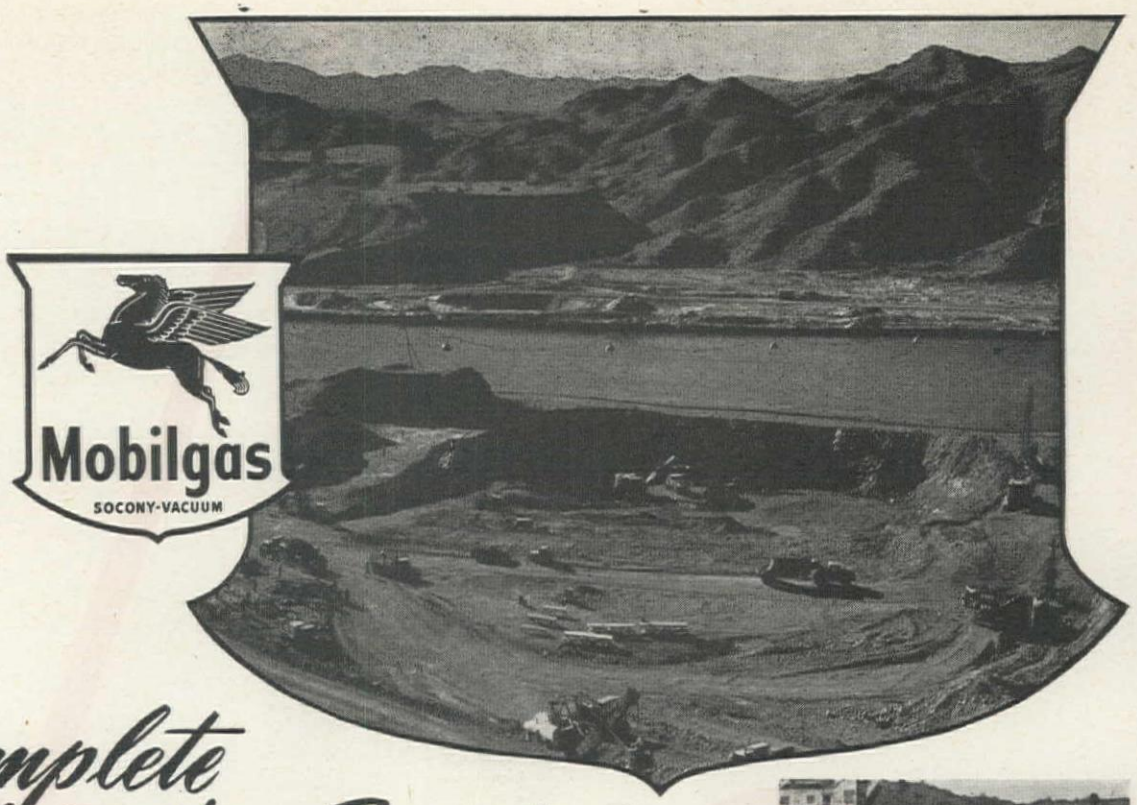
SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

Profitable POWER

Handling heavier loads faster . . . operating on smaller quantities of low-cost fuel 

. . . designed for easy servicing,  Cummins Dependable Diesels are the source of profitable power on hundreds of jobs such as yours.

CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA



Complete Lubrication Service

FOR UTAH CONSTRUCTION CO. at DAVIS DAM

Forty-two dump trucks are running twenty-four hours a day in a record-breaking earth-moving job for The Utah Construction Co. at Davis Dam. These 12 or 14-yard bottom-and-end-dump trucks are filled by five shovels, carving out the 4500 foot diversion channel for the Colorado River. The Utah Company holds a joint venture contract of $21,462,505, from the Reclamation Bureau, for this power development and water control dam, situated between Boulder and Parker dams.

General Petroleum's Contractors' Service supplies a complete stock of fuels and lubricants at Davis Dam, and G. P. products are used 100% for every type of equipment on the job. Selection of each type of oil and grease is based on severity of service, past experience and Equipment Manufacturers' recommendations. Performance is constantly checked by James Bly, experienced G. P. lubrication engineer assigned to the job.

Jack Hanafin, G. P. contractor representative, looks over the Davis Dam job, where he works closely with General Supt. T. L. Terry, and H. E. Williams, project engineer.

Fuel and lubricant needs are supplied from this convenient G. P. dock, with complete stocks right on the job.

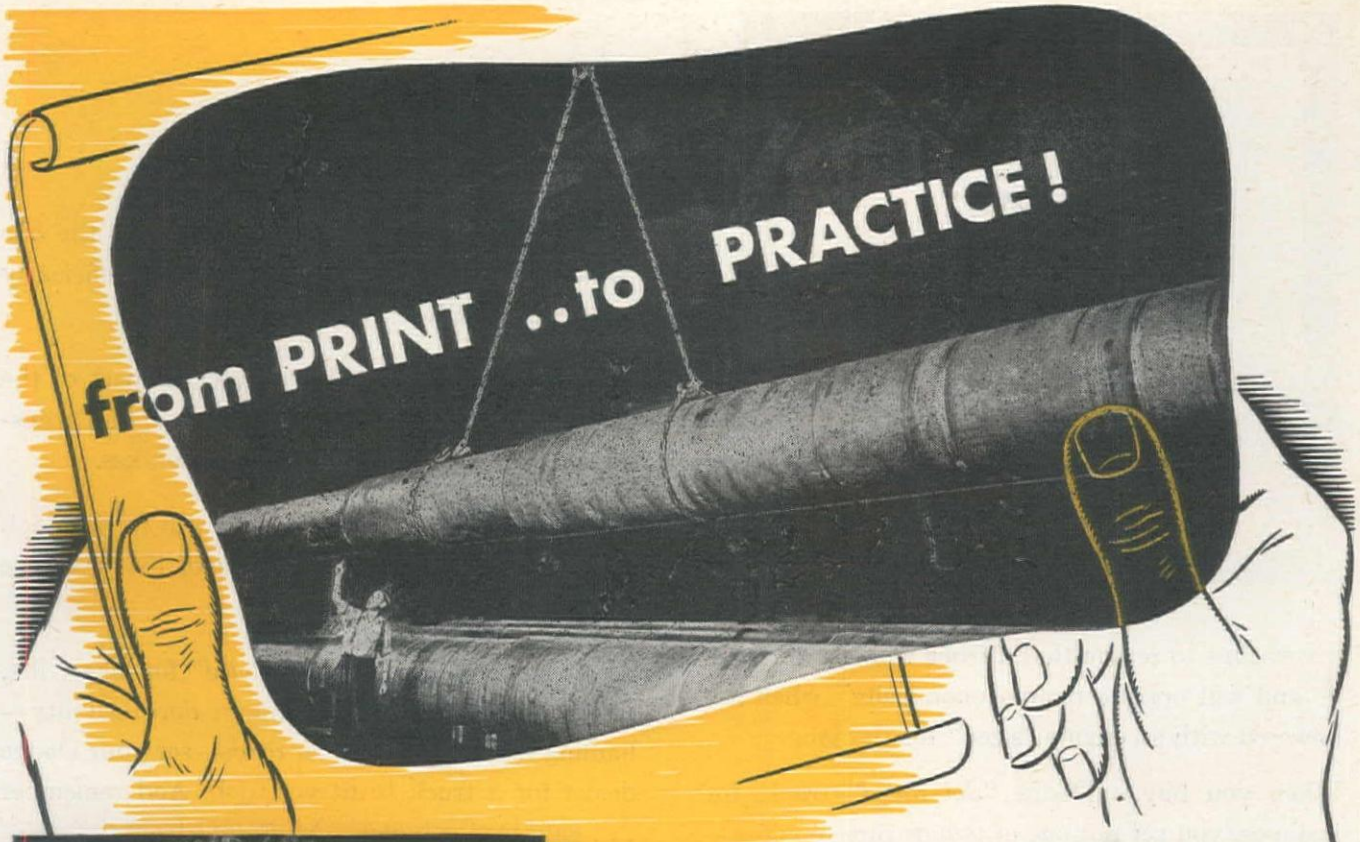
• • •

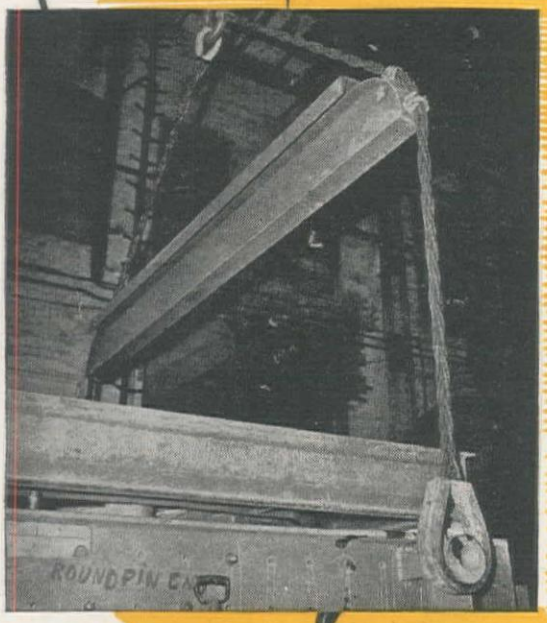
Mobilgrease in wheel bearings stood up under a 54-ton load when this equipment was hauled 38 miles up a 6% grade, with outside temperature at 115°F.

GENERAL PETROLEUM CORPORATION

{A Socony-Vacuum Company}

Tune in every Monday night, 6:30 PST, NBC Network, for the Victor Borge show, starring Benny Goodman and his orchestra





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

*PATENTS: U. S., 1475859, 1824671, 2142641, 2142642, 2299568; CANADIAN, 252824, 258068

Give us the "picture"... we'll fit your routine lift or special job with the correct YELLOW STRAND *BRAIDED* SLING*

It can be a blueprint, sketch or description. Given an accurate "picture" of your lifting problem, we will suggest a practical answer. And because it will be in the form of a Yellow Strand *Braided* Safety Sling, you'll get an efficient sling with these advantages: increased protection for men and loads, easy-to-manage flexibility, high kink-resistance, light weight.

Is the load slippery or awkward, requiring a choker grip? Should it be cradled in a basket hitch... picked up by the edges... hooked through eyebolts... kept level? For such recurring situations in factories, foundries, shops, utilities, warehouses and construction industries, there are numerous types of Yellow Strand *Braided* Slings. One may fit your case. But if you need an original sling—perhaps with spreader bar or special hooks—we'll design a custom job embodying the stamina of Yellow Strand Wire Rope and the time-saving features of the patented *braided* construction.

Send details of your application now and let B & B engineers offer a recommendation. Broderick & Bascom Rope Co., St. Louis 15, Mo. *Branches:* SEATTLE, Portland, New York, Chicago, Houston. *Factories:* SEATTLE, St. Louis, Peoria.

BRODERICK & BASCOM
Yellow Strand
***BRAIDED* SAFETY SLINGS**

Remember this:

A TRUCK THAT FITS THE JOB LASTS LONGER

IT STANDS to reason that a truck will last longer—and will operate more economically—when it's powered with an engine "sized" for the job.

When you buy a Dodge "*Job-Rated*" truck, for instance, you get not one of two or three engines—but the right one of 7 different engines—the one "*Job-Rated*" to handle your jobs most efficiently and economically.

You get the right unit in every other part of the truck, too—the right one of 5 clutches, of 4 transmissions, of 18 rear axles—the right brakes.

Dodge can give you a truck that will fit your job—because Dodge builds a range of 175 different "*Job-Rated*" chassis models.

So if you want a truck "*Job-Rated*" for longer life, greater economy, and maximum dependability—hauling *your* loads over *your* roads—see your Dodge dealer for a truck to fit your job. And remember . . . *only* Dodge builds "*Job-Rated*" trucks!

DODGE DIVISION OF CHRYSLER CORPORATION

ONLY DODGE BUILDS "*Job-Rated*" TRUCKS

Fit the Job . . . Last Longer !

We were behind the 8-ball until...

We were going crazy on this big housing project. An old building had been razed, and it was our job to get the debris out of there but *fast!* Hard as we worked, we just couldn't seem to stay on schedule.

I'd probably be a gibbering idiot if our Oliver "Cletrac" dealer hadn't happened to drive out. "Why not put a Sargent OVERHEAD on that Cletrac of yours?" he grinned. "Then you can back up to that mess, get a load, and pull straight up to your truck, without turning, and dump the load. You'll save enough time to catch up to schedule. I've got an OVERHEAD in my place now. Send in your tractor, and my boys will mount it tonight."

Well to cut the story short, that's just what I did, and we not only caught up to schedule, we beat it! That quick service certainly got us out from behind the eight-ball. The Oliver "Cletrac" dealer is a good guy to know.

Cletrac

a product of

The OLIVER Corporation

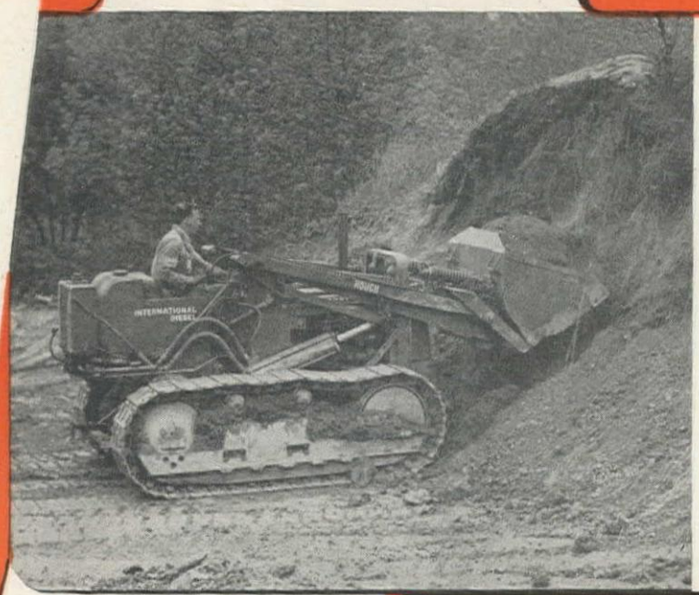
OLIVER
Cletrac
SALES
SERVICE

"THE SIGN OF EXTRA SERVICE"

State of *Arizona*: Choguill Tractor Co., Phoenix. State of *California*: Gustafson Tractor Co., Eureka; Mechanical Farm Equipment Dist., Inc., San Jose; Comber & Mindach, Modesto; Tractor Service Company, Inc., 820 Broadway, Chico; Tractor & Equipment Co., San Leandro; Flood Equipment Co., Sacramento; W. J. Yandle, Santa Rosa; Hamsher Tractor Co., Stockton. State of *Washington*: Inland Truck & Diesel Company, Spokane; Pacific Hoist & Derrick Co., Seattle; Melcher-Ray Machinery Co., 202 East Alder Street, Walla Walla; Coleman-Jones Equipment Co., Chehalis; Central Tractor and Equipment Co., Wenatchee. State of *Oregon*: Loggers & Contractors Machinery Co., Portland and Eugene. State of *Idaho*: Idaho Cletrac Sales Co., Lewiston; The Sawtooth Company, Boise. *Western Montana*: Western Construction Equipment Company, Billings and Missoula. State of *Nevada*: B & M Tractor & Equipment Corp., 1420 S. Virginia St., Reno. *British Columbia*: Pacific Tractor & Equipment, Ltd., 505 Railway Street, Vancouver.

HOUGH "HUFF" Digging Power

ON TRACKS



MODEL 9-A BULLDOZER SHOVEL

Here's full 1 yd. capacity in a Bulldozer-Shovel built specifically for the International T-9 or TD-9 TracTracTor. The Model 9-A is a real DUAL-PURPOSE unit — a rugged versatile Shovel and a powerful full-fledged Bulldozer, to handle a wide variety of excavating, stripping, loading, grading or any bulk materials. Packed with exclusive features — unique in design, thoroughly job proved in every detail, the Hough Model 9-A can be relied upon for maximum daily yardage at the lowest net cost per yard.

ON WHEELS

MODEL HL Payloader

For construction, excavation, maintenance or general bulk material handling the powerful 1 cu. yd. HL Payloader can take over and cut yardage costs sharply. Built big and powerful, easily maneuvered, perfectly balanced, the HL is built from the ground up for heavy duty material handling service. Digs, loads, carries, dumps and spreads; available with bulldozer blade and crane attachment, the HL is the most versatile unit of its kind.

SEND for Catalog No. 164 on the Model 9-A and Catalog No. 163 on the HL today.

THE FRANK G. HOUGH CO.

707 SUNNYSIDE AVENUE, LIBERTYVILLE, ILLINOIS

NOW For the first time

ROADSTONE *and* AGSTONE
in one operation!

This portable hammermill plant is another new Cedarapids portable crushing and screening plant that opens up an entirely new market for contractors and quarry operators. The crushing unit is a 4033 or a 3033 Cedarapids Hammermill that will turn out 20 to 40 tons of agstone or 140 to 180 tons of 1½" material per hour depending upon the size of feed and kind of stone. Or — the portable hammermill plant will produce a percentage of each product all in one closed cycle operation. The agstone comes off the delivery conveyor over the end of the plant while the crushed rock comes out on a side delivery conveyor.

In this installation, the rock is going into a five yard portable truck loading bin that acts as a surge between truck loads. Note the separate power unit for the hammermill which permits a change of speed to suit hammermill performance in various kinds of stone.

The Cedarapids Hammermill not only produces a much finer quality and uniform size of material but will turn out more tons per hour than other similar types of pulverizing equipment of comparable size, and with less maintenance cost. Cedarapids Hammermills are available in 2033, 3033 and 4033 sizes — on skids or portable.

When you buy a crushing plant—buy the best — buy Cedarapids. See your nearest Cedarapids dealer for details.

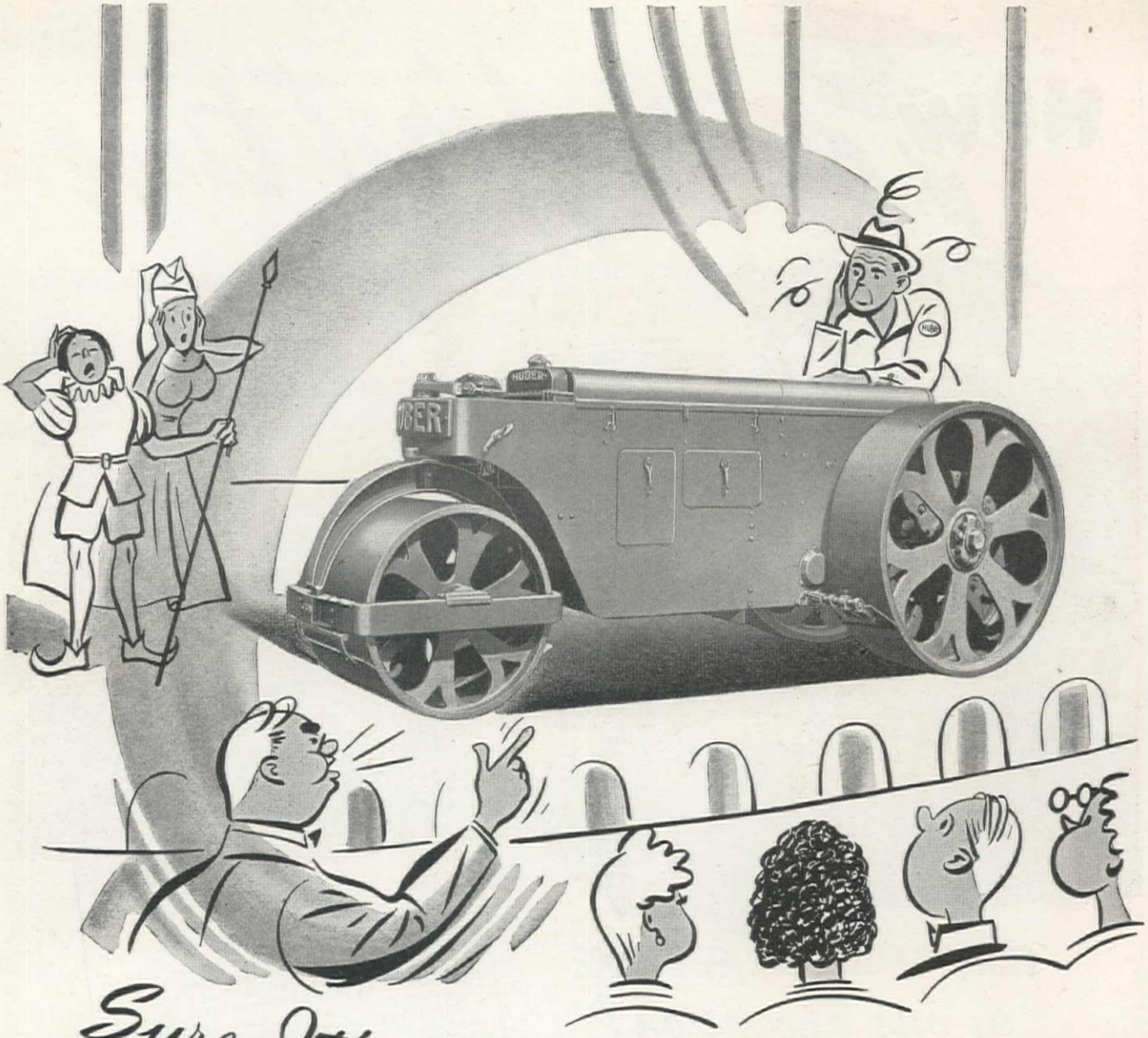
THE IOWA LINE

of Material Handling Equipment is distributed by

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

Cedarapids
Built by IOWA

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.



Sure It's a Star Performer . . .

. . . . . but a **HUBER ROAD ROLLER** is not a means of entertainment. It is an honest-to-goodness working tool that gets "top billing" in any contractor's language—and plenty of "curtain calls" for performance, economy, and service. This is your "cue" to check the many features of Huber Rollers that will make a "hit" with you.

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

LEE & THATRO EQUIPMENT CO.	Los Angeles, Calif.
JENKINS & McCLOUD	Reno, Nevada
CONTRACTORS' EQUIPMENT & SUPPLY CO.	Albuquerque, New Mexico
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WESTMONT TRACTOR & EQUIPMENT CO.	Missoula, Montana
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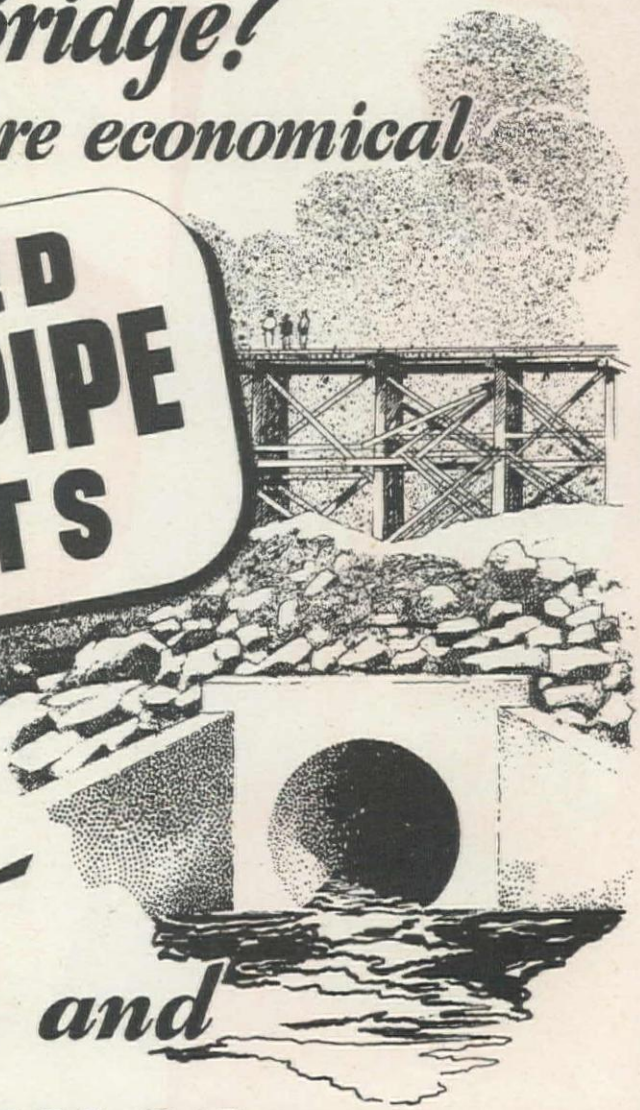
Why build a Bridge?

when it's more economical to install

REINFORCED CONCRETE PIPE CULVERTS



for Strength-Capacity and Permanence

with less traffic delays

Have you noticed how many old-fashioned bridges are being replaced with durable, reinforced concrete pipe culverts? Permanent installations with greater economy and less traffic delay during construction, reinforced concrete pipe culverts are *made right* in your own district and delivered *on the job* ready for installing. For better culverts and drainage pipe, write for the name of your nearest manufacturer members of--

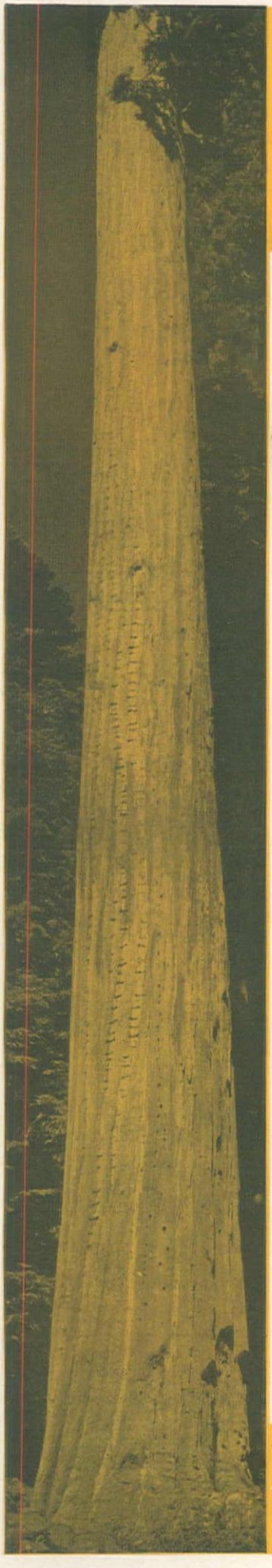
CALIFORNIA ASSOCIATED

CONCRETE PIPE

MANUFACTURERS

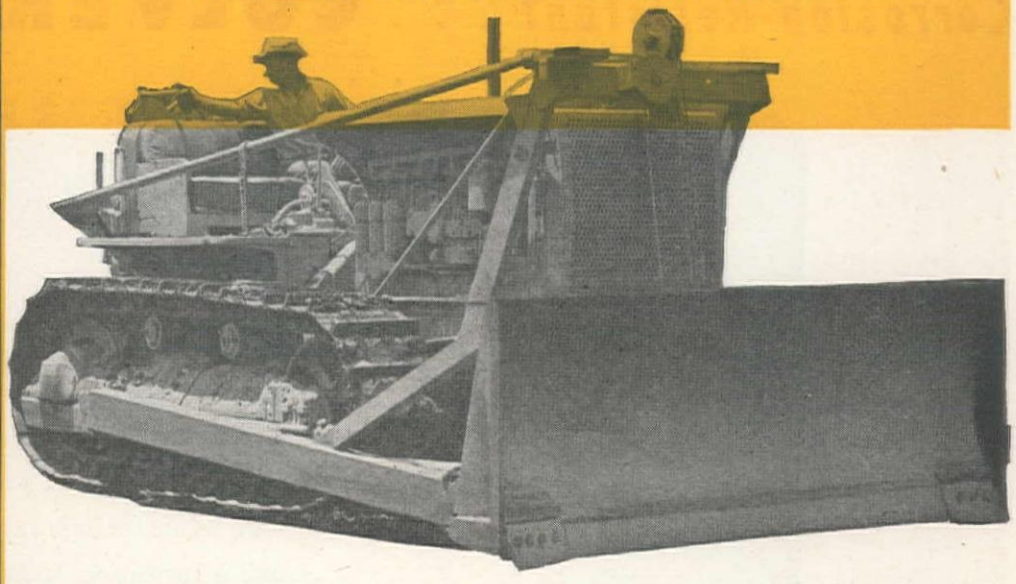
P.O. BOX 152 FRESNO 7

CALIFORNIA



K-B BULLDOZERS

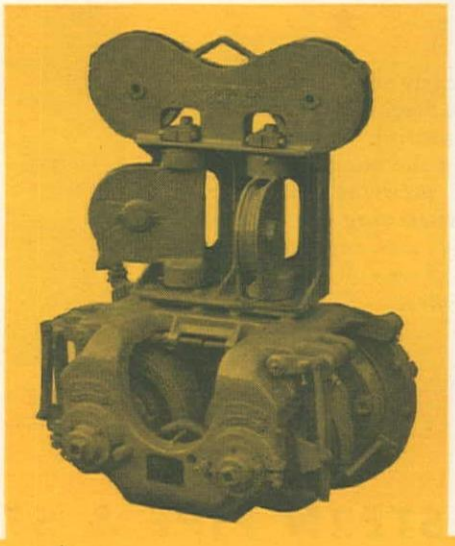
"BY TEST—BEST FOR THE WEST"



Years of experience in earthmoving on countless western jobs has gone into the sturdy design of K-B Bulldozers. Out of that experience has been developed the practical features that give K-B Bulldozers their *extra* performance. Blade design that really rolls the dirt, with mounting at the proper angle to fit the job. Ample clearance and maximum lift and drop for handling all types of dirt. A welded box-type frame that gives utmost strength with minimum weight. Extra digging ability in hard shale and rock that saves ripping and blasting. All these things and many others make the K-B Bulldozer ideal in logging road construction or any other job.

Hydraulic or Cable Control

The Kay-Brunner Model 78 double drum power control unit is built for heavy duty work on tractors up to 113 h.p. All working parts are easily accessible—all movable sections are bolted—no welded parts. Simple to maintain, one adjustment takes up clutch—one adjustment tightens or loosens brakes. Precision built of cast steel sections machined to insure complete parts interchangeability.



***Equipment Division*, Kay-Brunner Steel Products, Inc.**
2721 ELM STREET, LOS ANGELES, CALIFORNIA

Corrosion-Resistant . . . CULVERT PIPE

. . . IN DIAMETERS FROM 8" to 96"

Asphalt coating culvert pipe to give it additional protection.

Where durability and resistance to corrosion are important, Western Pipe & Steel's corrugated culvert pipe is being specified. It is available in both iron and steel; also, asphalt-dipped and plain.

Corrugated galvanized culvert pipe possesses the advantages of light weight and comparative low cost. Its use for highway, railroad and airport drainage is increasing, together with its use for storm drains, sewage disposal plants, and as replacements for small bridges.

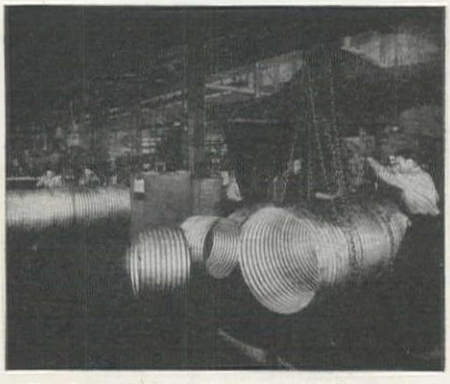
Western's facilities for the fabrication of corrugated culvert pipe and other steel products are unmatched in the West. With its five plants, Western is in position to handle large volume production.

Sectional plate pipe and arches are also available in sizes from 60 inches to 180 inches.

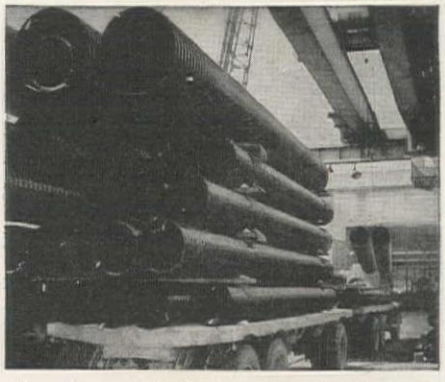
★

For nearly 40 years, Western Pipe & Steel has taken the lead in pioneering methods for improving the quality of steel fabricated products. *For information concerning the company's products and engineering services, call any Western Pipe & Steel office.*

★



Riveting section of corrugated culvert pipe in one of Western's five plants.



Loading asphalt dipped culvert pipe for shipment to big drainage project.

WESTERN PIPE & STEEL COMPANY of CALIFORNIA

FABRICATORS • ERECTORS

P. O. Box 2015—Terminal Annex
5717 Santa Fe Ave., Los Angeles 54

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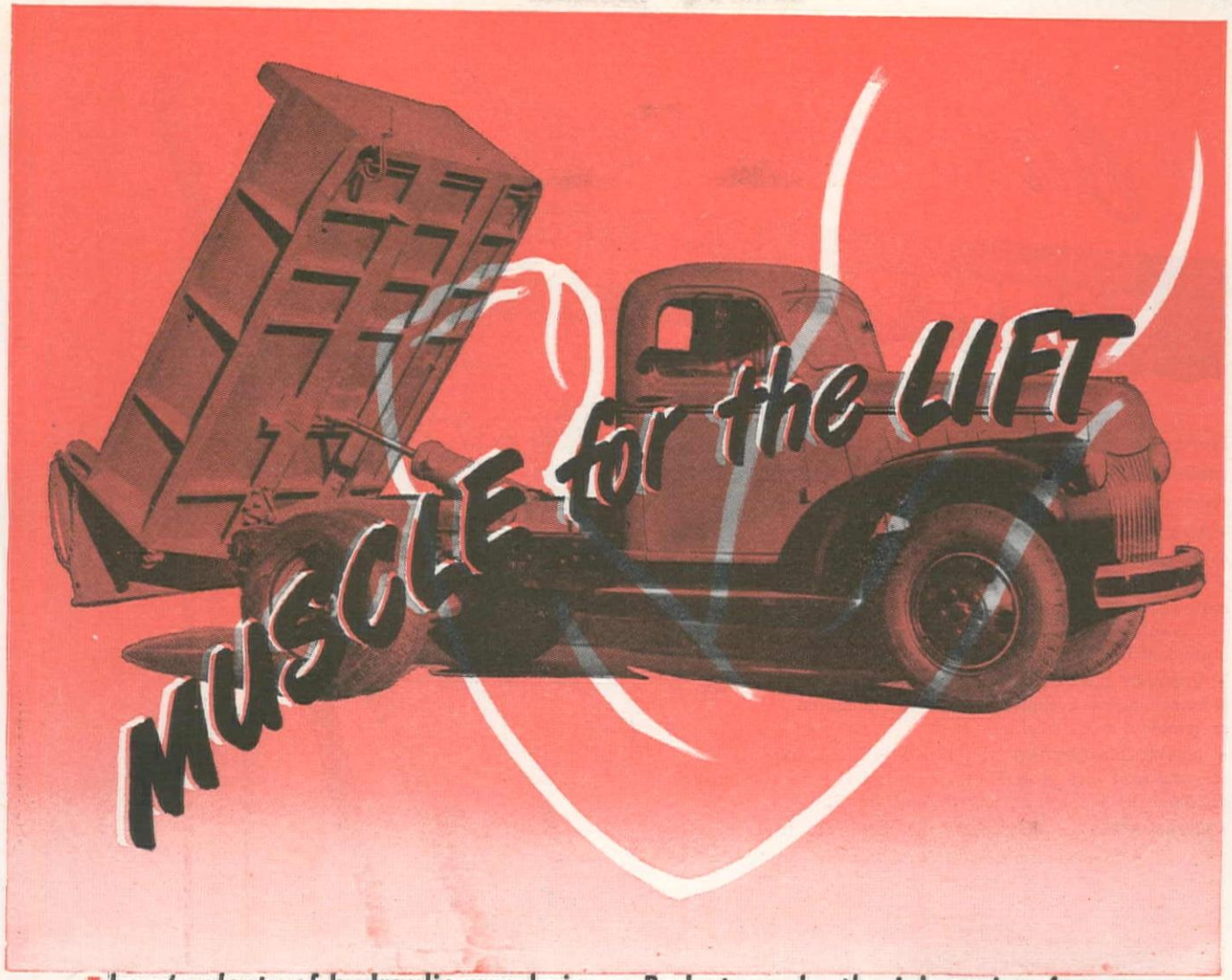


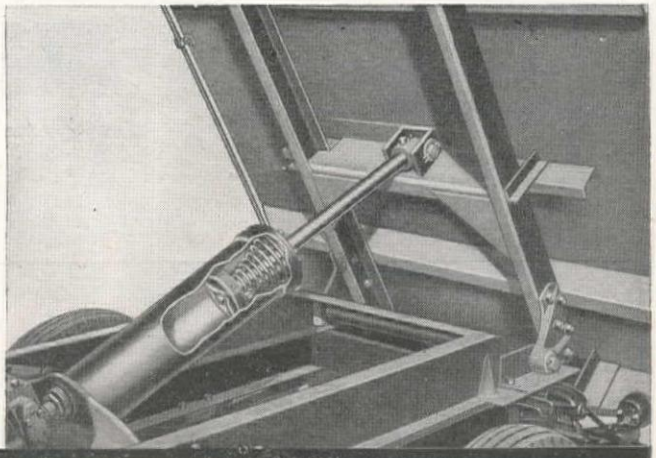
There's *plenty* of hydraulic muscle in those Gar Wood Hoists . . . plenty of *guts* to do a clean, quick dump job, no matter what you're hauling . . . plenty of *dependable* power to help you get your job done easier.

Why? They're *rugged*. All Gar Wood Hoists and Dump Bodies are designed, engineered, and built to do the toughest kinds of jobs.

What do you work with . . . sand, gravel, rock, coal, construction material? Whatever you carry, there's *at least* one type of Gar Wood Hoist and Dump Body to make the job easier, faster, safer . . . help you make more money-per-job.

Want proof? Ask the men who use Gar Wood Hoists and Dump Bodies on the toughest jobs all over the world . . . year in and year out. Ask them for an honest appraisal. See if they don't agree that *if it's Gar Wood it's got to be good!*

Then, for your *own* good . . . specify Gar Wood!



Specify Gar Wood

GAR WOOD GW TRADE-MARK INDUSTRIES

HOIST & BODY DIVISION
WAYNE, MICHIGAN

HOISTS • BODIES • WINCHES • CRANES • BOATS • HEATING EQUIPMENT • TANKS • ROAD MACHINERY

ARIZONA: Allison Steel Mfg. Co., 19th Ave. and So. Pac. Tracks, Phoenix; CALIFORNIA: Gar Wood Industries, Inc., 1210 Mateo St., Los Angeles 21; Gar Wood Industries, Inc., 17th and Folsom Sts., San Francisco 10; COLORADO: Liberty Trucks & Parts Co., 690 Lincoln St., Denver 1; IDAHO: Olson Mfg. Company, 4000 Warm Springs, Boise; General Machinery Co., E. 3500 Block, Riverside Ave., Spokane 1, Wash.; MONTANA: Reymer Machine Co., Inc., 115 N. 25th St., Billings; Granite Alaska Garage, 45 W. Granite St., Butte; NEW MEXICO: Oden Equip. Co., 312-24 N. 4th St., Albuquerque; Lone Star Equip. Co., 1500 Texas St., El Paso, Texas; OREGON: Fruehauf Trailer & Equip. Co., 1138 S. E. 10th St., Portland 14; UTAH: Lundberg Equip. Co., 257 N. Main St., Logan; Cate Equip. Co., 49 East 9th South, Salt Lake City 4; WASHINGTON: Fruehauf Trailer & Equip. Co., 300-4 Michigan St., Seattle 8; WYOMING: Wilson Equip. & Supply Co., 902 W. 22nd St., Cheyenne.

fast-low cost...

power pole work...

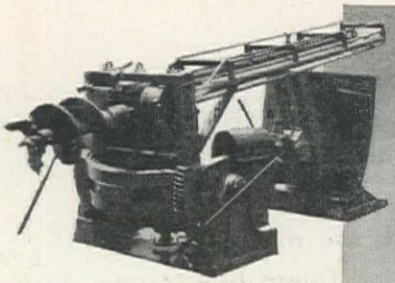
with

BUDA EARTH DRILLS

Here are some of the features that make BUDA Earth Drills the increasing choice for fast-low cost power pole work:

- **MAXIMUM MOBILITY** . . . easily transported as a complete truck-mounted unit.
- **QUICK SET-UP AND DRILLING** . . . One man moves tower to vertical position in a few minutes (on cradle-mounted models) . . . in average ground, drills better than a foot a minute.
- **COMPACT SELF-POWERED UNIT** . . . Heavy-duty gasoline engine, complete unit easily mounted or removed from truck.
- **CONTROLLED DRILLING** . . . Operator completely controls feed into ground. 4 speed and reverse transmission provides flexible power, any desired speed.
- **CLEAN HOLES** . . . Compacts the hole wall, fewer cave-ins.

See your nearest Distributor for complete details.



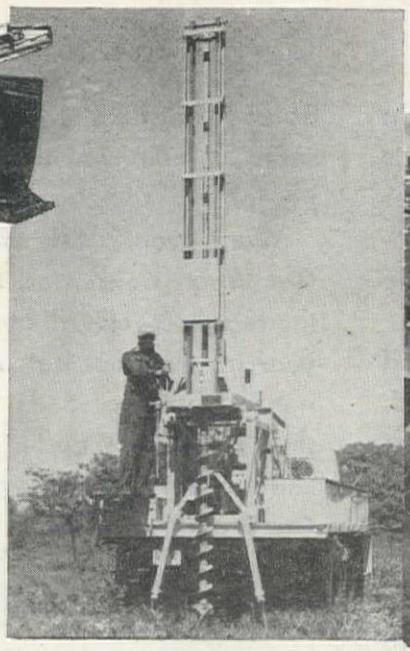
• *Above:* Cradle-mounted Earth Drill Model HBE, shown in traveling position, complete with 45 h.p. gasoline engine.

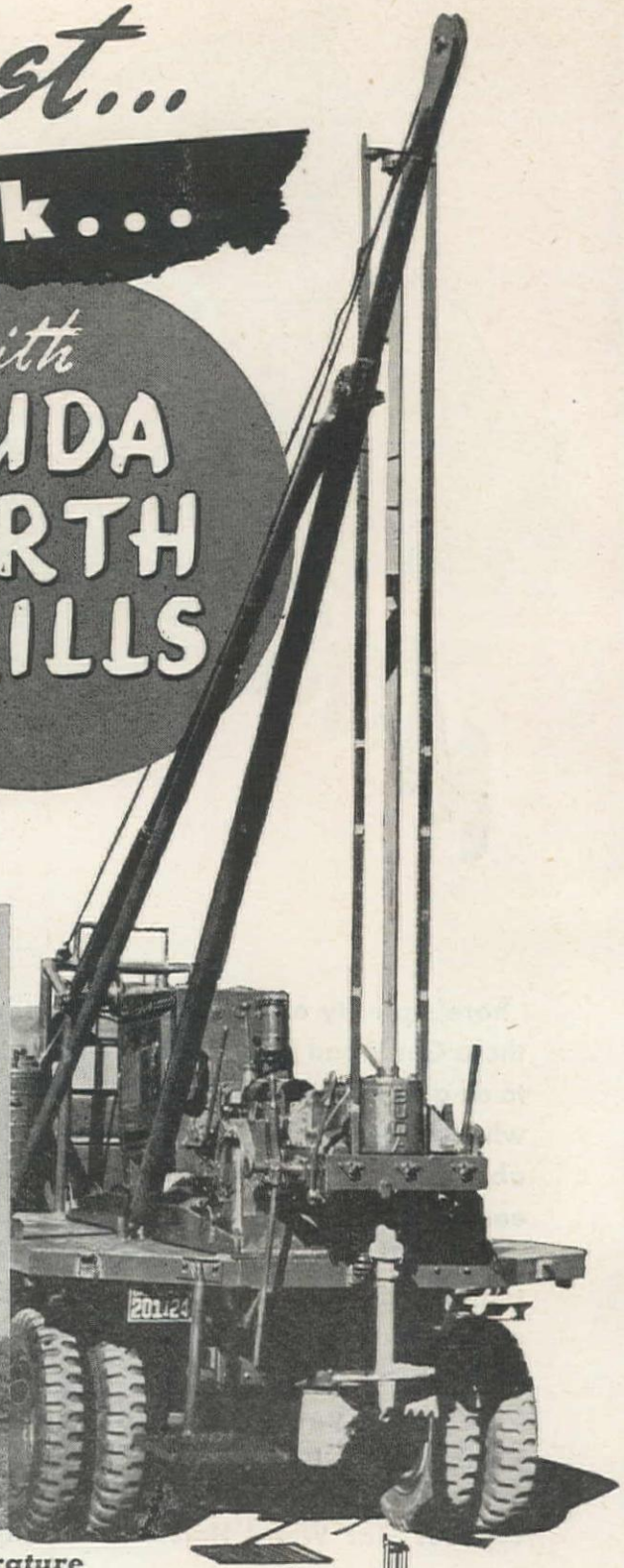
•

• *Right:* Model HBH Deep Hole Earth Drill. Ideal for soil testing, prospecting. Tower lowers into traveling position for highway traveling.

•

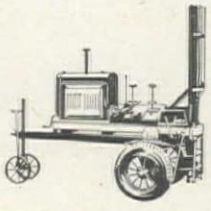
• *Extreme right:* Model HBE Earth Drill with pole setting derrick in place for power pole work.





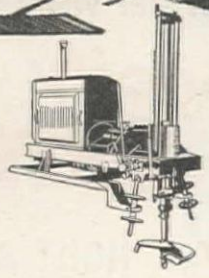
Write for literature

Buda Model HBB Trailer-Mounted Earth Drill. Can be towed by truck or tractor.



BUDA

15424 Commercial Avenue
HARVEY *(Chicago Suburb)* ILLINOIS



Buda Model HBD Earth Drill. Rigid head. Designed and built for a wide range of construction work.

Earth Drill Distributors:

LOS ANGELES, CALIFORNIA	**Fornaciari Company**
SAN FRANCISCO, CALIFORNIA	**Coast Equipment Company**
PHOENIX, ARIZONA	**Brown-Bevis Equipment Co.**
DENVER, COLORADO	**Ray Corson Machinery Co.**
SALT LAKE CITY, UTAH	**Arnold Machinery Co., Inc.**
BILLINGS, MONTANA	**Western Construction & Equipment**

DISTRIBUTORS

ALABAMA
Birmingham—YOUNG & VANN SUPPLY CO.
ARIZONA
Phoenix—MINE & SMELTER EQUIP. CO.
ARKANSAS
North Little Rock—STANDARD EQUIP. and SUPPLY CO.
CALIFORNIA
Oakland and Eureka—BURAN EQUIP. CO.
Los Angeles—GARLINGHOUSE BROTHERS
COLORADO
Denver—GUNDERSON-KRINGEL CO.
CONNECTICUT
Stamford—M. F. TAYLOR CONSTRUCTION EQUIPMENT & SUPPLIES
FLORIDA
Jacksonville—FARQUHAR MACHINERY CO.
Miami—GENERAL EQUIP. & SUPPLY CO.
Tampa—EPPERSON & CO.
GEORGIA
Atlanta—GILL EQUIPMENT CO.
ILLINOIS
Chicago—CENTRAL CONTRACTORS SERVICE
Mt. Vernon—ED MEYER TRACTOR COMPANY
Rock Island—WESTERN EQUIP. & SUPPLY CO.
INDIANA
Indianapolis—BOCK EQUIPMENT CO.
Rochester—DEEDS EQUIPMENT CO.
IOWA
Cedar Rapids and Des Moines—GLOBE MACHINERY & SUPPLY CO.
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Baltimore—MARYLAND SUPPLY & EQUIP. CO.
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Detroit—W. H. ANDERSON COMPANY, INC.
Grand Rapids—E. K. S. EQUIPMENT CO.
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MINNESOTA
Duluth and St. Paul—BORCHERT-INGERSOLL, INC.
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Jackson—WATKINS-ALDRIDGE EQUIP. CO., LTD.
MISSOURI
Kansas City—CONTRACTORS SUPPLY CO.
St. Louis—MISSOURI-ILLINOIS TRACTOR & EQUIPMENT CO.
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Butte and Great Falls—MONTANA HARDWARE CO.
NEBRASKA
Omaha—FEHRS TRACTOR & EQUIP. CO.
NEVADA
Reno—NEVADA TRUCK SALES
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Columbia—TIDEWATER SUPPLY CO., INC.
TENNESSEE
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Memphis—HOWELL EQUIPMENT CO.
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El Paso—DON A. CARPENTER CO.
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San Antonio—ACME WIRE AND IRON WORKS
Waco—CONTRACTORS EQUIPMENT SALES & SERVICE, INC.
UTAH
Salt Lake City—THE LANG CO., INC.
VIRGINIA
Norfolk and Roanoke—TIDEWATER SUPPLY CO.
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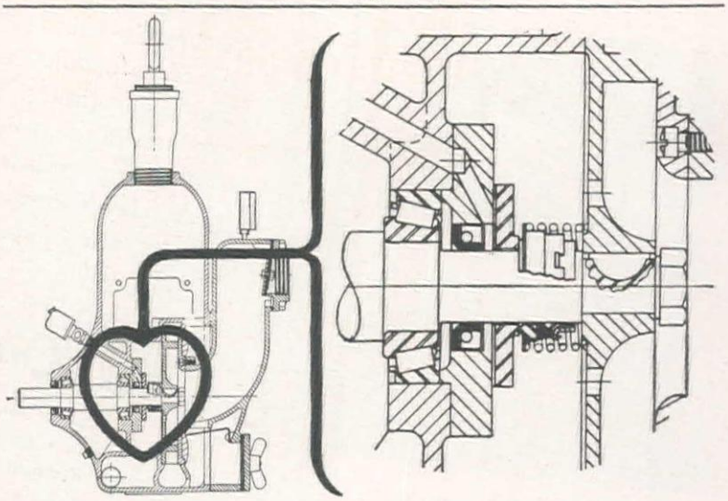
WEST VIRGINIA
Charleston—CLYDE W. BECKNER, INC.
WISCONSIN
Milwaukee—STONE MANUFACTURING CO.
Park Falls—STEIGER MOTOR SALES

NOVO NEWS

MARCH, 1947



Novo Stout-Hearted Seal Always Stays on the Job!

More Features of Novo "Pronto-Prime" Pumps

- Super-Speed Priming
- Independent Pump Unit
- Accessibility of All Wearing Parts
- Self-Cleaning
- Universal Base
- Advanced Mechanical Advantages

Models range from 1½" to 6"—3,000 to 90,000 gallons per hour

Other Contractors' Equipment By Novo

Novo contractors' equipment—backed by over 50 years of manufacturing experience—includes diaphragm pumps, pressure pumps, hoists, generator sets, air compressors, pavement breakers, engines.

"Build us a pump with a seal that can take it," said hundreds of contractors when Novo asked them what features they considered most important in self-priming centrifugal pumps.

Novo engineers produced exactly what was ordered—and more!

For example, for over 2000 hours a Novo "Pronto-Prime" actually pumped water containing so much abrasive grit, including sandblast sand, that the metal alloy impeller and wear plate were cut and gouged. Yet the seal was still good—still holding perfectly. In another instance, a "Pronto-Prime" ran 1008 consecutive hours after being rescued from repeated cave-ins.

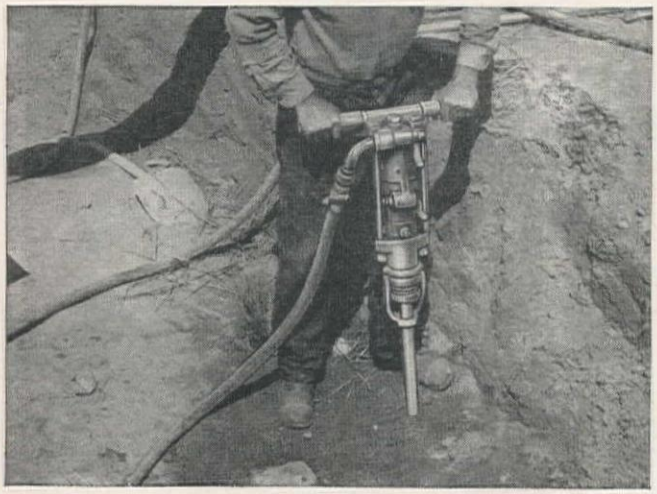
Such performance records are the result of sound basic design. The Novo stout-hearted seal is self-aligning, self-adjusting, oil lubricated, hardened and polished steel. A corrosion-resistant spring maintains correct pressure between the rotating and stationary plates.

For tough jobs, more and more contractors are depending on the Novo "Pronto-Prime."

Allied Member of A.E.D.

NOVO ENGINE COMPANY
LANSING 9, MICH. U.S.A.
CONTRACTOR'S EQUIPMENT
· GRAY IRON CASTINGS ·
ENGINES

There's always a CP Tool exactly suited to the job



For whatever type of work a contractor needs pneumatic tools, he will find CP equipment designed to handle the specific job most efficiently and economically. Besides the four typical CP products illustrated, other CP tools in wide use in contracting work include wagon drills, demolition tools, clay diggers, sheeting drivers, concrete vibrators, sump pumps and sludge pumps. Write for Catalog 600.

CHICAGO PNEUMATIC TOOL COMPANY

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

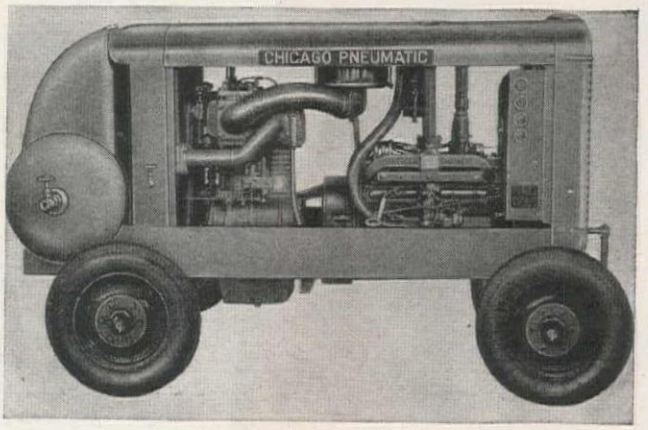
Pneumatic Tools • Air Compressors • Electric Tools • Diesel Engines
Rock Drills • Hydraulic Tools • Vacuum Pumps • Aviation Accessories

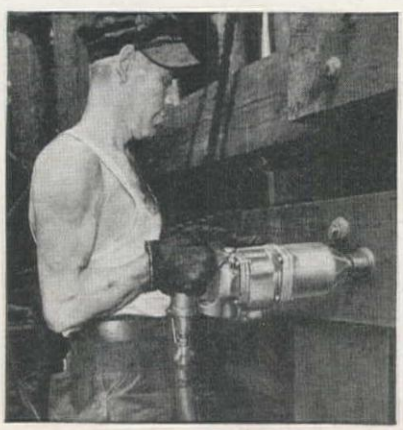
A Leader in its Weight Class

The 56-pound CP-42 Sinker Drill is ideal for general excavation, road work, shaft sinking, and quarrying, because of its penetrating power, fast drilling speed, strong rotation and good hole cleaning qualities. Its low air consumption makes it especially desirable for use with portable air compressors. CP Sinker Drills range from the 28-pound CP-22 to the 119-pound CP-60N.

Three Models of CP Backfill Tampers

CP has a pneumatic Backfill Tamper exactly suited to any particular job. CP-3 for medium heavy jobs; CP-MM for all general heavy backfill tamping; CP-4 for extra heavy work, as in earth dams. In trench work, especially, CP Backfill Tampers soon earn their cost by saving the time and labor of handling surplus excavated material.





Ample Air — with Fuel Economy

In this portable compressor the gradual speed regulator and other CP features effect fuel savings of 15% to 35%. Varying the speed in proportion to air demand also reduces maintenance. CP gasoline-driven compressors range from 60 to 315 c.f.m.; Diesel-driven, from 105 to 500 c.f.m.

Popular CP Impact Wrench

With the CP 365-RP Impact Wrench, nuts and bolts, up to 1¼" bolt size, are applied or removed in a fraction of the time required by hand wrenches. Available either with side handle or pistol grip. One of a complete line of six models.

Distributors

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WESTERN MACHINERY CO., Spokane, Washington

HALL-PERRY MACHINERY CO., Butte, Montana

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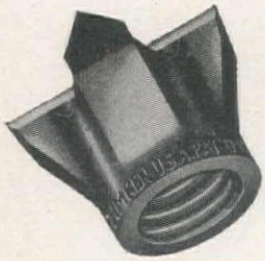
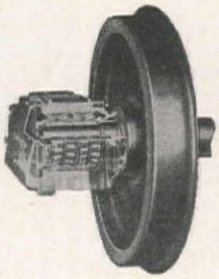
WESTERN MACHINERY CO.
760 Folsom Street
San Francisco 7, California

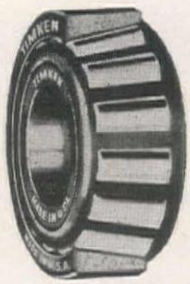
WESTERN MACHINERY CO.
500 North 16th Street
Sacramento 2, California

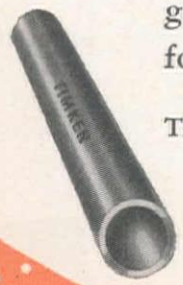
TIMKEN

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









Means "Made By The Timken Roller Bearing Company." It identifies the source of Timken Tapered Roller Bearings, Timken Railroad Roller Bearings, Timken Alloy Steel, Timken Seamless Steel Tubing and Timken Rock Bits. This trade-mark is your assurance of getting genuine Timken products. Look for it when buying.

THE TIMKEN ROLLER BEARING COMPANY
CANTON 6, OHIO

Haul TWICE as much . . for HALF the cost

Part of the fleet of Hercules Huskies operated by the R. B. Tyler Company on a road construction project near Miami, Florida. Working 24 hours a day, these semi-trailer dump bodies carry 12 cubic yards per trip over a 44-mile round trip route.

On the big hauling and dumping jobs, one Hercules Husky does the work of two standard size dump trucks. That's a 50% savings in direct labor costs right there. Better still, you can add the savings on fuel, tires and maintenance, made possible through FEWER trips with LARGER loads. Logical? . . . you bet it is! Ask your Hercules distributor to show you the facts and figures about the Hercules HUSKIES . . . designed and built for the big jobs.

DISTRIBUTED EXCLUSIVELY BY

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1331 Third Ave., ***Seattle***

OREGON—
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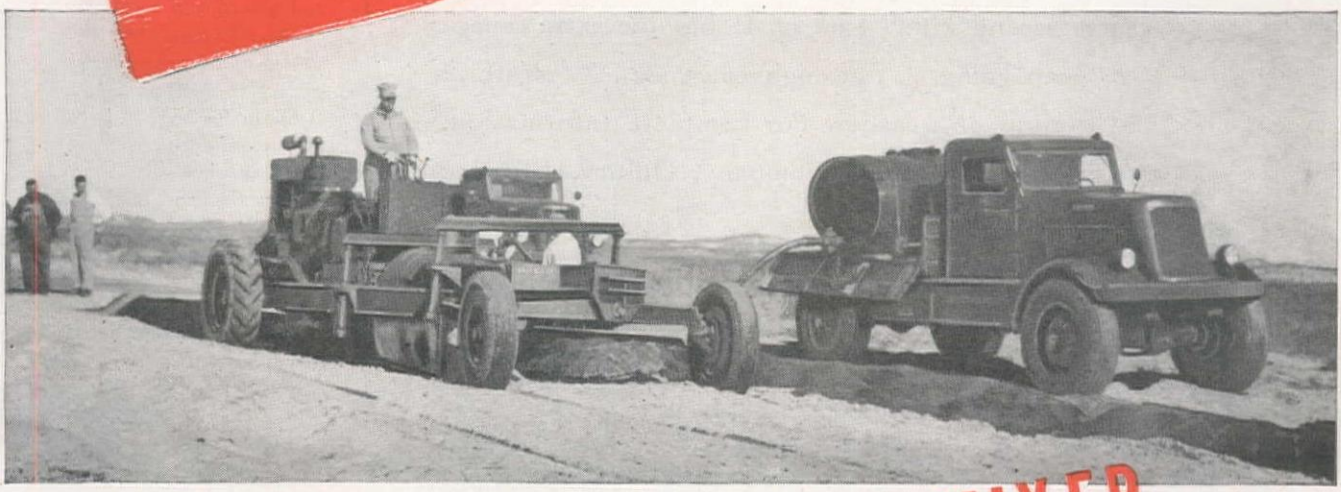
HERCULES
DUMP BODIES · POWER TAKE-OFFS
HYDRAULIC HOISTS

HERCULES STEEL PRODUCTS COMPANY . . . GALION, OHIO

Maintaining Traction in Loose Ball Bearing Sand . .



THE SELF-PROPELLED MODEL 36 WOOD ROADMIXER

Taking loose ball bearing sand from a flat position requires adequate traction. A self-propelled Wood Roadmixer Model 36 demonstrates its ability while mixing a stretch of beach road near Nags Head, Dare County, for the North Carolina State Highway and Public Works Commission. RC cut-back, taken directly from the supply truck, was mixed with the sand. To keep traction, the supply truck was forced to carry a light load and use oversize balloon tires. In addition to its adequate traction under all kinds of going, the self-propelled Wood Roadmixer Model 36 offers 15 m.p.h. job-to-job speed, mixing capacity up to 150 tons per hour and *one man operation.* It requires the lowest capital investment per ton of capacity of any mix-in-place equipment on the market. See your local distributor for complete facts, or write for Bulletin 36.

ROADBUILDING

WOOD MANUFACTURING CO.

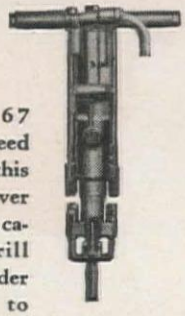
EQUIPMENT

BOX 620, 6900 TUJUNGA AVENUE • NORTH HOLLYWOOD, CALIFORNIA

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

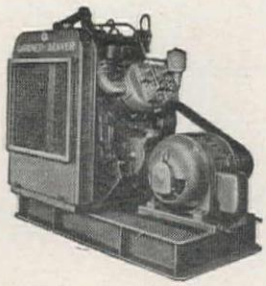
when you need "SECOND WIND"

■ Equipment that slows down or quits when the going gets too tough won't do for long-pull jobs. The Gardner-Denver equipment shown on this page has its "second wind" *built in.* It has the extra capacity to keep going . . . at high efficiency . . . regardless of ground or weather. For complete information, write Gardner-Denver Company, Quincy, Illinois.



With its 67 pounds of speed and power, this Gardner-Denver S73 has the capacity to drill faster in harder ground and to drill deeper holes without the handicap of excess weight. Yet this sinker uses no more air than the average 55-pound drill. Excellent holding characteristics enable the operator to maintain high drilling speed, hour after hour.

Broiling heat or bitter cold won't affect the performance of Gardner-Denver Portable Compressors. That's because their cylinders are *completely* water jacketed for sustained high efficiency, regardless of temperature or altitude. Complete water cooling, too, means less lubricating oil consumption.



With its combination radiator and air-cooled intercooler, this Gardner-Denver "WB" Compressor is ideal where water is scarce or of poor quality. Evaporation of the cooling water is practically nil, so that water seldom needs to be added. Note the compact design.

GARDNER-DENVER

SINCE 1859

USE COMPRESSED AIR FOR SAFETY CONVENIENCE FLEXIBILITY

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

A full six-foot change, with something extra for odd steel changes, is readily handled by the Gardner-Denver UM99 Wagon Drill. Vertical holes can be drilled down to a rock face or at any angle with the fully adjustable U-bar of the UM99. The D99D drill blows deep holes efficiently.

A ROCK EATER

says BILL REES, Monroe, Wisconsin

More than 2 yards of ¾" per minute with Universal 293-Q Pacemaker Senior Portable Quarry Plant

"In my opinion, the Universal 293-Q Pacemaker is the finest portable rock plant built. It consistently produces 125 yards of ¾" material per hour from rock with a wearing test of 41.3. It can be moved from the quarry for dynamite shots and be back in operation in 22 minutes. On one occasion we moved the entire plant 28 miles and were set up and crushing to capacity in 4 hours. We have produced over 300,000 tons with no expense other than normal operation and maintenance costs which have been unusually low."

"Stream-Flo" Engineering and Twin-Dual Rolls Provide Amazing Capacity at Low Cost Per Ton

Featuring three stages of reduction with only two crushers, the 293-Q Pacemaker shovel-loads direct from quarry, increasing profits by eliminating the expense of quarry trucks and costly ramps. Once you start feeding rock into its sturdy shovel-loading hopper, material flows in a steady stream to save time and cut operating costs. The complete plant consists of a jaw crusher, Twin-Dual roll crusher, 2½-deck gyrating screen, apron feeder, bar grizzly and by-pass, under conveyor, Rotovator, and return conveyor. These units, combined with all auxiliaries necessary in a smooth, well-balanced plant, are mounted on a dual pneumatic tired gooseneck truck equipped with mechanical brakes and rear wheel equalizers.

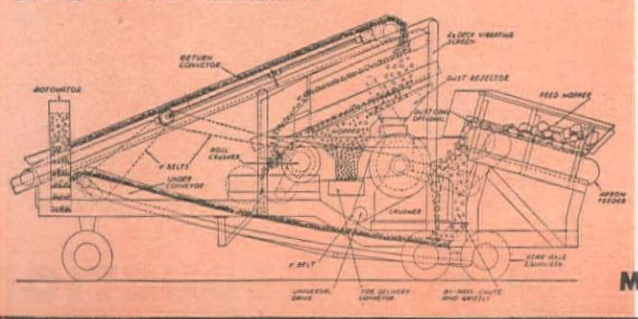
For capacity to tackle largest jobs, for portability to handle small contracts profitably, investigate the Universal 293-Q Pacemaker now. Learn how "Stream-Flo" Engineering gives you higher capacity, ready portability, and lower costs per ton. Your nearby Universal distributor has the facts or write for full information.

●

Contractors Equipment Corporation, Portland 14, Oregon
Industrial Equipment Company
Los Angeles, Calif., Oakland 3, Calif., Reno, Nevada
Olson Manufacturing Co. ..... Boise, Idaho
J. K. Wheeler Machinery Co. ..... Salt Lake City 1, Utah

●

293-Q FLOW OF MATERIAL



UNIVERSAL

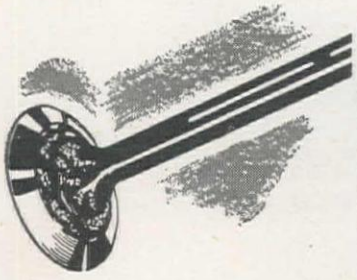
ENGINEERING CORPORATION
323 Eighth Street N.W., Cedar Rapids, Iowa

MORE TONS PER HOUR—LESS COST PER TON

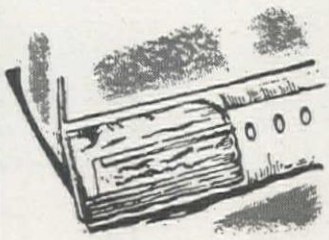
ENGINEERS AND BUILDERS OF "STREAM-FLO" ROCK, GRAVEL, AND LIME PLANTS—SCREENING AND WASHING PLANTS—CONVEYORS—APRON FEEDERS

LONGER LIFE FOR NEW AND WORN PARTS

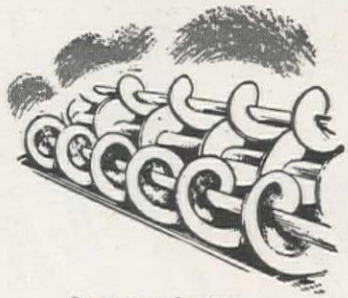
FROM EXHAUST VALVES TO DRILLING BITS . . .



Exhaust Valves



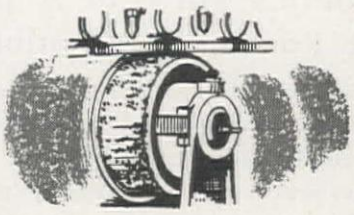
Bulldozer Tips



Conveyor Screws

Clam Shells

Roll Crusher Teeth



Track Rollers

Drilling Bits

BY HARD-FACING WITH STOODY ALLOYS

Whatever your problem — heat, corrosion, impact or abrasion — Stoody hard-facing alloys will give you the most effective solution. With one application of these wear-retarding materials the service life of both new and worn parts is increased many times. Listed below are some of the most widely used Stoody alloys.

For further details *write for Catalog No. 40* — Air Reduction, General Offices, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, General Offices, Houston 1, Texas. Represented Internationally by Airco Export Corporation.

1—STOODITE. A cast alloy rod recommended for application where wear resistance is particularly important. Deposit tends to polish under abrasion. Applied electrically or by gas process. Deposits test from 54 to 58 on Rockwell "C" scale.

2—STOODY SELF-HARDENING RODS. A rod fabricated of steel strip and carefully selected alloys. Suitable for electric or gas application. Good wear resistance and high impact strength in relation to hardness. Forms excellent bond with manganese steel. Particularly useful for hard facing excavating equipment. Can be forged without loss of hardness. Deposits test from 52 to 54 on Rockwell "C" scale.

3—STOODY No. 1. A non-ferrous, hard-facing alloy consisting of cobalt, chromium and tungsten . . . excellent corrosion resistance . . . retains hardness and wear resistance even at red heat . . . cold hardness of 53 to 55 on Rockwell "C" scale. May be used wherever heat, abrasion and corrosion are involved. While recommended for application by gas process, rods suitable for electric application are available. Rockwell "C" hardness A.C., D.C.: 46 to 50.

4—STOODY No. 6. Excellent corrosion resistance . . . high impact and good wear resistance with some degree of ductility . . . retains hardness and wear resistance at red heat . . . cold hardness of 42 to 44 Rockwell "C" Scale. May be used wherever heat, impact, abrasion and corrosion are involved. While recommended for application by gas process, rods suitable for A.C. or D.C. electric application are available.

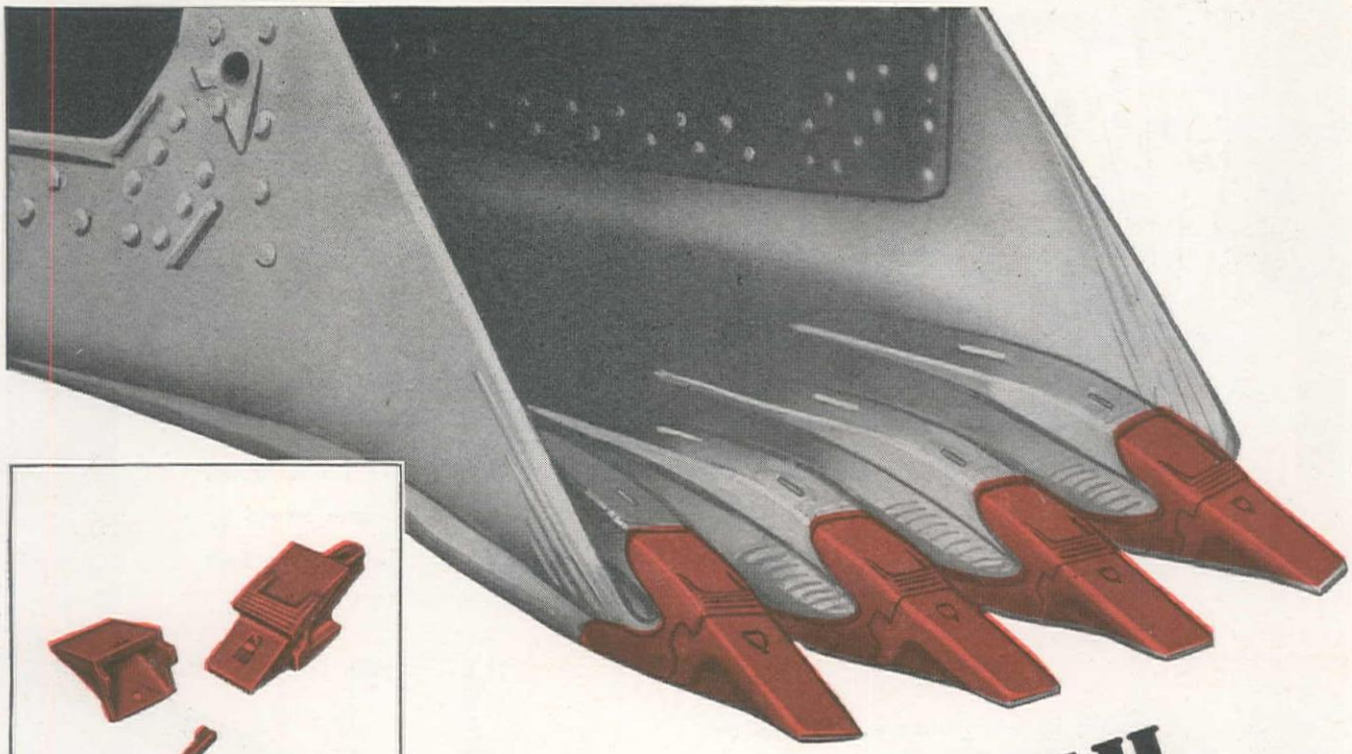
5—TUBE BORIUM. A fabricated rod composed of particles of Borium and mild steel strip . . . forms an extremely hard surface, which is heterogeneous and will resist wear better than any other metal. Because of the great, almost diamond-like hardness of the Borium particles, this rod has highly efficient cutting qualities on the edges of rotary drilling bits, bean knives and the like . . . as well as being resistant to abrasion on scarifier teeth, grader blades and similar tools.

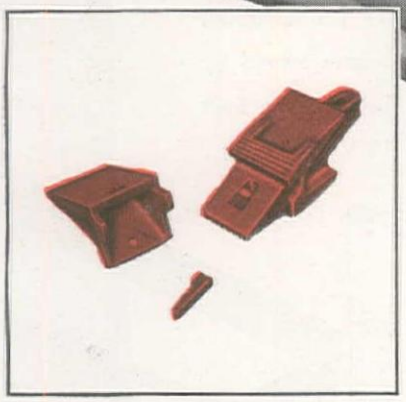
There are two types of Tube Borium, Acetylene Tube Borium, for oxyacetylene application only, and Electric Tube Borium for electric application only.

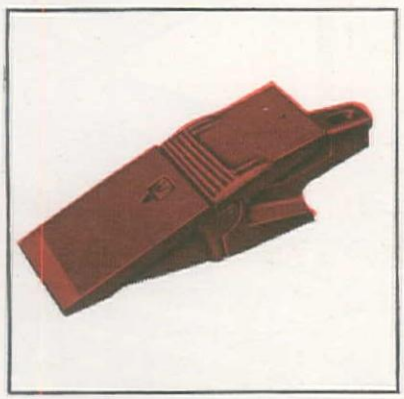
AIRCO **AIR REDUCTION**

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







Top: Perfect fit of tooth onto adapter takes all shock and strain. Only function of Alloy steel pin, which is held in place by molded live rubber sheathed in steel at point of contact, is to lock the point on the adapter.
Above: Renewable tooth attached to adapter.

A NEW TOOTH for faster digging

Sharp teeth mean fast digging — and here at last is the new, better tooth that *is* sharp and *stays* sharp with the least possible trouble, expense and loss of time.

It is the new *ESCO* renewable tooth that is made to stay sharper and dig faster in four ways:

1. **Wear Resistant**—made of *ESCO* Alloy 12M steel; tip of point is heat treated to twice the hardness of rest of point.
2. **Shock Resistant** — lasts longer on the job.
3. **Self-sharpening Design** — stays sharp as it digs.
4. **Quickly Replaced** — four teeth removed and replaced in five minutes.

Adapters and box type points are available for practically all popular makes of buckets. This reduces tooth stock to a minimum.

The *ESCO* renewable tooth has proved itself on some of the toughest jobs in the country, including Friant Canal section of Central Valley (California) project, Davis Dam in Colorado, Anderson Ranch Dam in Idaho, and on severe rock quarry work for Basalt Rock Co., of Napa, California, Puget Sound Bridge & Dredge Co., of Seattle, Washington.

The *ESCO* renewable tooth will dig faster for you, too. Get detailed information from your nearest *ESCO* representative, or fill in and mail the coupon to us.

ESCO STAINLESS STEEL FOR ULTIMATE ECONOMY

ELECTRIC STEEL FOUNDRY

2163 N. W. 25th AVENUE • PORTLAND 10, OREGON

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ELECTRIC STEEL FOUNDRY
2163 N. W. 25th Avenue, Portland 10, Oregon
Without obligation, send me additional data on ESCO Renewable Tooth.

NAME_____

ADDRESS_____

CITY_____

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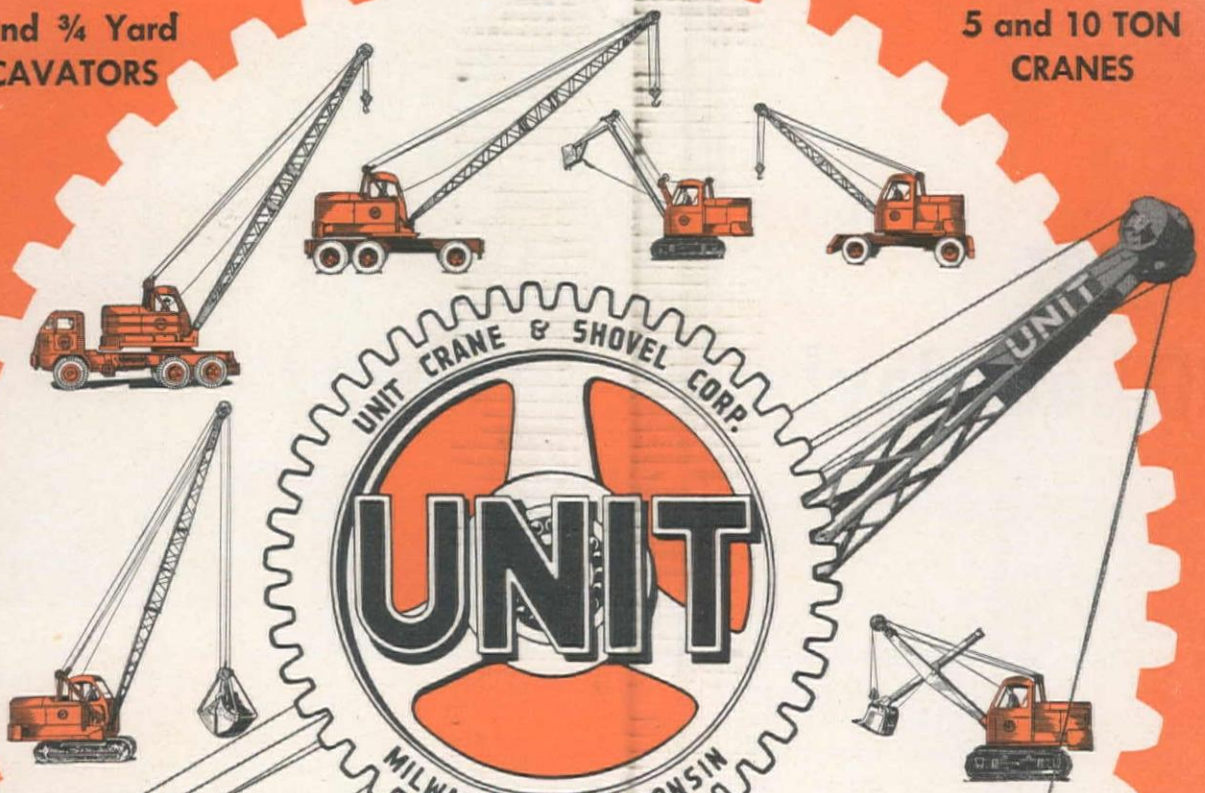
SEE YOUR NEAREST DEALER: Brown-Bevis Equipment Co., Los Angeles-Phoenix; Feenaughty Machinery Co., Portland-Seattle-Boise-Spokane; B. M. Fletcher, Butte; Garfield & Company, San Francisco; Held & McCoy Machinery Co., Denver; C. H. Jones Equipment Co., Salt Lake City; Studer Tractor & Equipment Co., Casper,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

Super Service

ON ALL TYPES OF JOBS!

½ and ¾ Yard
EXCAVATORS

5 and 10 TON
CRANES



Every UNIT is FULLY CONVERTIBLE

Regardless of whether your job calls for a shovel, clamshell, magnet, dragline, trenchoe, grapple or backfiller, a UNIT machine easily "fills the bill"! For UNIT is convertible to ANY attachment and gives an excellent account of itself on ALL types of service. The change from one attachment to the other can easily and quickly be made on the job, by any ordinary mechanic. UNIT exclusive features include: Automatic traction brakes... Disc type clutches... One-piece cast gear case and above all, UNIT's safety-promoting FULL VISION CAB.

CONTACT FACTORY DIRECT FOR PRICE AND DELIVERY

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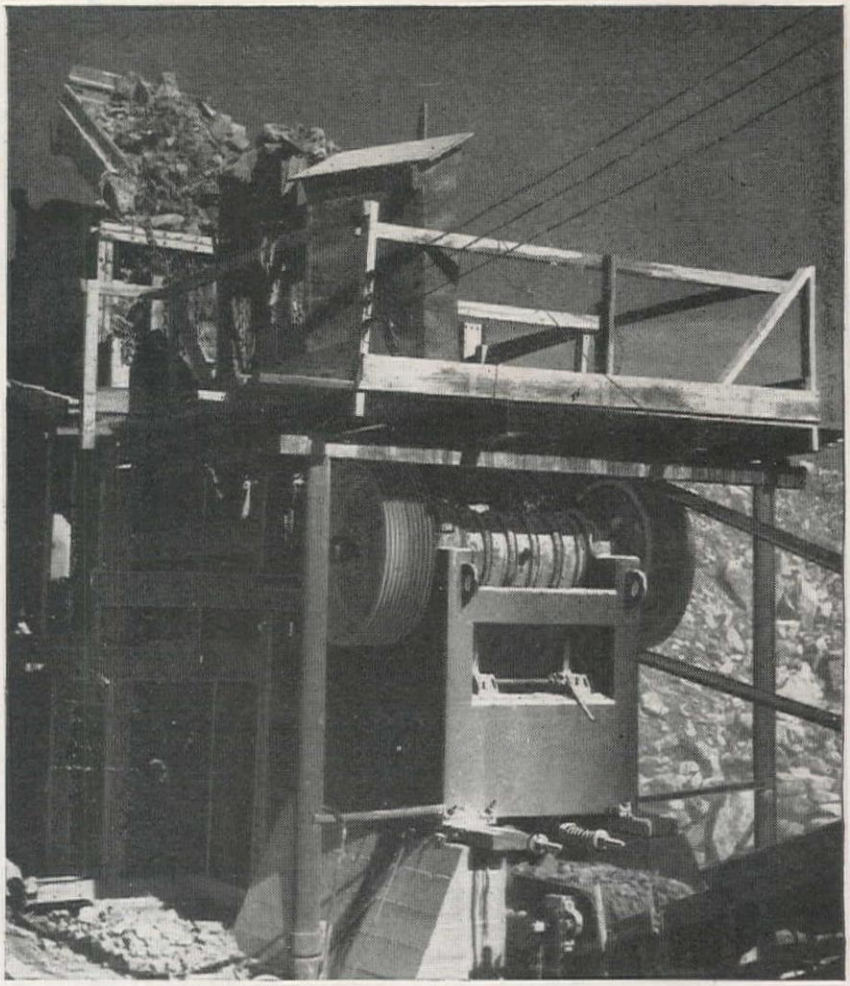
6421 WEST BURNHAM STREET

1500 tons per 10 hour day!



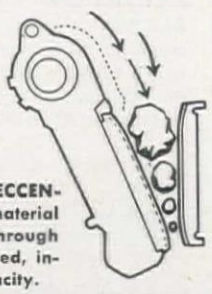
That's an average day's output for this 30″ x 42″ Pioneer Jaw Crusher operated by the Meshberger Stone Company of Columbus, Indiana. This huge primary crusher easily handles the largest rock that passes through the bucket of a two yard shovel.

When you buy a primary for limestone, flintrock or the toughest ore; investigate the overhead eccentric type crusher. Comparatively low installation cost, greater capacity and low maintenance enables you to produce more material at lower cost per ton. Pioneer Jaw Crushers are made in nine sizes ranging from 10″ x 16″ to 30″ x 42″ to meet the requirements of your job.

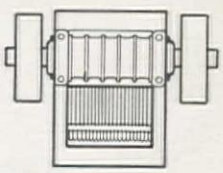
Buy a Pioneer *Continuflo* Jaw Crusher for higher output—lower upkeep!

PIONEER ENGINEERING WORKS
1515 Central Avenue • Minneapolis 13, Minnesota

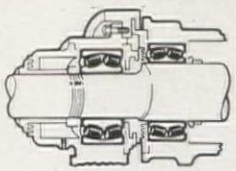
3 Big Reasons Why Pioneer is Preferred...



OVERHEAD ECCENTRIC forces material down and through as it is crushed, increasing capacity.



BIG RECTANGULAR OPENING takes larger rock . . . saving time and money in preparing material for the crusher.



EXCLUSIVE MOUNTING places bearings closer together than on any other anti-friction primary, reducing strain on the shaft.

BUY BOTH—
Higher Output, Lower Upkeep!

Pioneer *Continuflo* EQUIPMENT

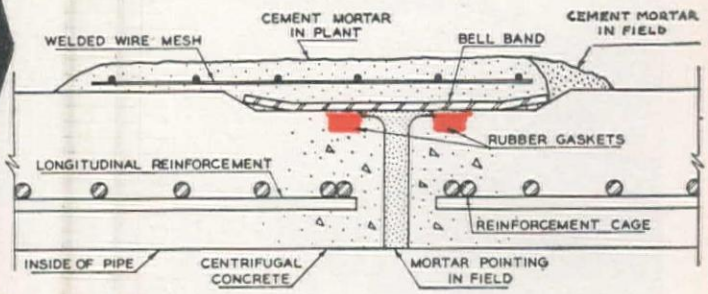
Neil B. McGinnis Company, Phoenix, Arizona; Pioneer Machinery Company, Idaho Falls, Idaho; Sanford Tractor & Equipment Company, Reno; Tractor & Equipment Company, Sidney, Montana; Westmont Tractor & Equipment Company, Missoula, Montana; Coast Equipment Company, San Francisco; Connelly Machinery Company,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

Another SIGNIFICANT DEVELOPMENT BY

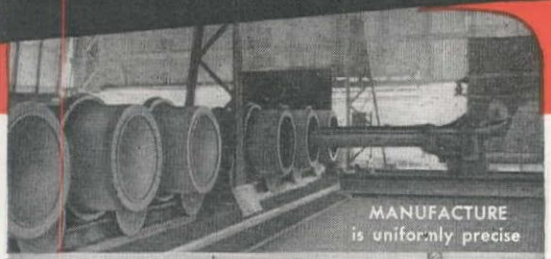
American

PIPE & CONSTRUCTION CO.

HUME CENTRIFUGAL CONCRETE PRESSURE PIPE WITH DOUBLE RUBBER GASKET JOINT...



Cross-sectional View of Field Assembly



MANUFACTURE
is uniformly precise

INSTALLATION
is simple and economical

SERVICE
is available throughout West

REPRESENTATIVE INSTALLATIONS

McAllister Springs Water Supply System, Olympia, Wash.
35,397', dia. 36", Max. oper. head 150' (1947)

Wichita Falls Supply Line, Wichita Falls, Texas
97,247', dia. 39",—29,841', dia. 48",
Max. oper. head 100' (1946-47)

El Monte Pipe Line, Section IV, San Diego, Calif.
14,000', dia. 68", Max. oper. head 135' (1947)

Condenser Circulating System, Harbor Steam Plant
Wilmington, Calif.
322', dia. 18",—1,576', dia. 36",
Max. oper. head 100' (1943-1946)

Salt Water Inlet and Outlet Lines for Cooling System,
Union Oil Company, Los Angeles, Calif.
3,262', dia. 45", Max. oper. head 50' (1942)

Main Water Supply Line, Camp San Luis Obispo, Calif.
49,000', dia. 24", Max. oper. head 160' (1941)

Simple — Strong — Efficient

The need for a special kind of pipe for moderate operating heads was recognized by this company over 20 years ago. Requirements included high initial and sustained carrying capacity, permanance and economy.

As a result, American pioneered the development of Hume Centrifugal Concrete Pressure Pipe in the United States. An early development with this type of pipe was in the accurate placement of steel reinforcement. Another was the proper control of concrete mixes and spinning. Then the double rubber gasket joint was developed as a final addition to an otherwise already outstanding product. This joint provides a smooth and tight-fitting bell and spigot, and contributes to greater uniformity, safety and strength in the field closure.

This simple, accurately-fitting joint provides ample flexibility, and is another example of ingenuity and engineering skill in the development of better products for water supply lines. Write for descriptive literature.

AMERICAN PIPE & CONSTRUCTION COMPANY

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

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MAIN OFFICE AND PLANT—4635 FIRESTONE BLVD., SOUTH GATE, CALIFORNIA
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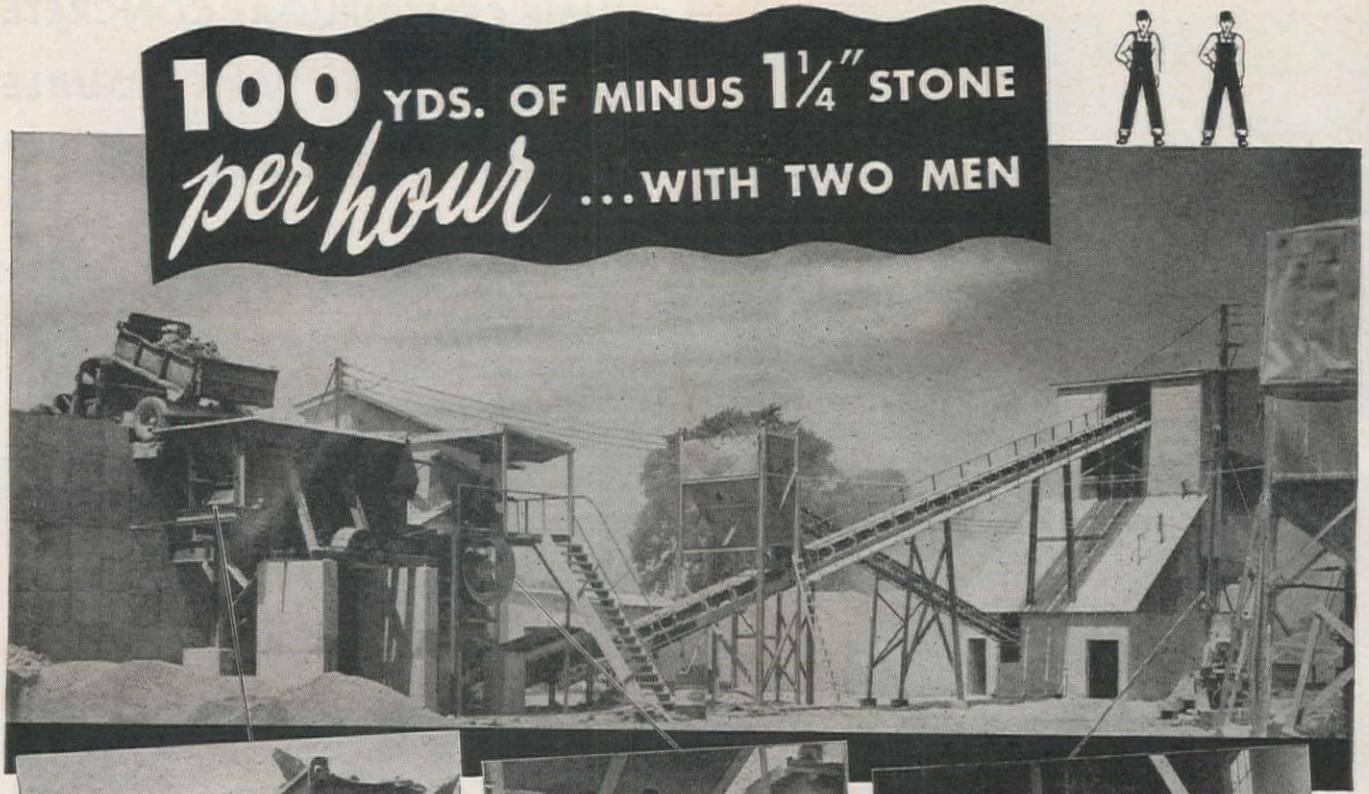
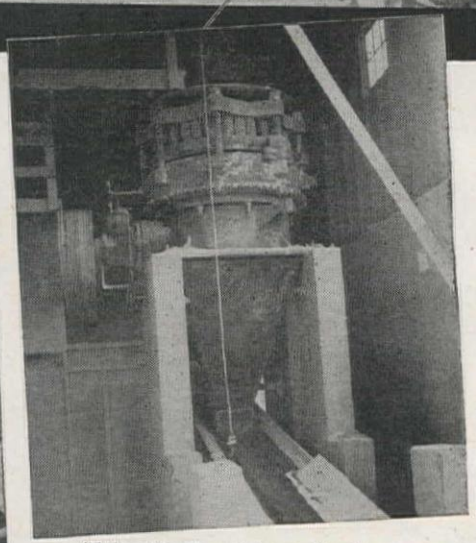
Specializing in the manufacture and installation of American Concrete Cylinder Pipe, Lock-Joint Concrete Cylinder Pipe, Pre-stressed Lock-Joint Concrete Cylinder Pipe, Hume Centrifugal Concrete Pressure Pipe.

100 YDS. OF MINUS 1¼" STONE *per hour* ...WITH TWO MEN



Telsmith Heavy Duty Apron Feeder

Telsmith Jaw Breaker



Telsmith Gyrasphere Crusher

• The Telsmith-equipped plant of Courtney & Plummer, contractors and producers, at Neenah, Wis., turns out 100 cy. yds. an hour. Three sizes of crushed stone are made—fines, passing 5/16" sq. screen opening, used for aglime; minus 3/4" chips used for resurfacing material; and minus 1¼" used for highway and building construction after preparation in the Courtney & Plummer ready-mixed concrete plant. Sound plant design plus the exceptional efficiency of Telsmith equipment, enables the plant to operate with only two men. Telsmith equipment includes: 36" x 10' Heavy Duty Apron Feeder; 25" x 36" Roller Bearing Jaw Breaker; 4' x 12' triple deck 2-bearing Vibro-King finishing screen; 36" Gyrasphere Secondary Crusher. Modernizing the old, or building a new plant? Consult Telsmith engineers . . . get Bulletin Q-30.

MILWAUKEE TELSMITH WIS. U.S.A.

Q-18

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

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

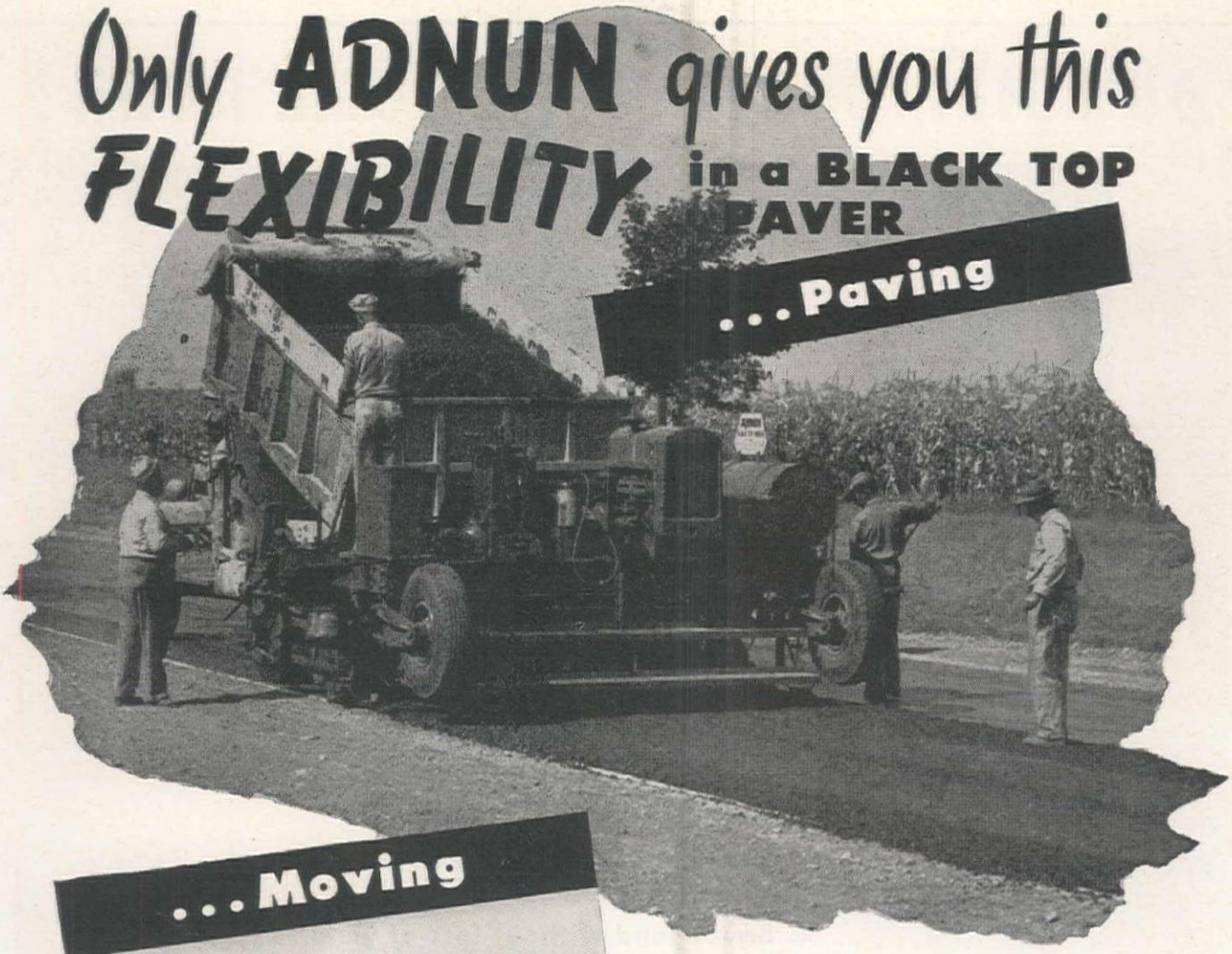
Clyde Equipment Co. Portland 9, Ore.

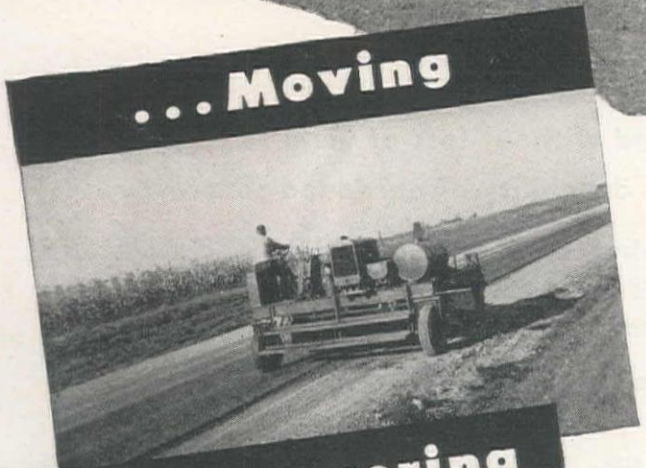
Clyde Equipment Co. Seattle 4, Wash.

General Machinery Co. Spokane 1, Wash.

Gordon Russell, Ltd. Vancouver, B.C.

Only ADNUN gives you this FLEXIBILITY in a BLACK TOP PAVER





Retractable wheels can be attached to Adnun Pavers already on the job, as well as to new machines. When ordering, please be sure to give serial number of your Adnun.

PAVING . . . Adnun Black Top Pavers continue to make records for fast, low-cost paving on a wide range of jobs. You can lay all of these materials with an Adnun: any type of bituminous paving, hot or cold, stone, slag, sand, gravel or soil cement. And Adnun Continuous Course Correction, hydraulic controls, power-cutoff, and many other exclusive advantages add up to real flexibility that means precision paving on more jobs for more profit.

MOVING . . . Between jobs, and returning the paver to begin a new strip, Adnun retractable wheels save you valuable time and labor . . . Just drop the wheels and roll smoothly over newly-laid pavement—or cobblestones—without damage to machine or road surface. Adnun can be easily towed, or operated under its own power when retractable wheels are down.

MANEUVERING . . . Turning around, or getting into position to begin paving, an Adnun simplifies the operator's job and permits more time on work that makes the profit: actual paving operation.

Your Adnun Distributor has the whole story on Adnuns . . . Ask him for details, or write us direct.

THE FOOTE CO., INC.

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ADNUN

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Browning-Ferris Machinery Co., Dallas & Houston, Texas; Francis Wagner Company, El Paso, Texas; Le Roi-Rix Machinery Co., Los Angeles, Calif.; C. H. Grant Company, San Francisco, Calif.; Hall-Perry Machinery Company, Butte, Montana; Western Equipment Company, Boise, Idaho & Spokane, Wash.; The Colorado Builders' Supply Co., Denver, Colorado; Lively Equipment Company, Albuquerque, New Mexico; The Lang Company, Inc., Salt Lake City, Utah; Howard-Cooper Corporation, Portland, Albany, Eugene, Roseburg, Central Point, Oregon, & Seattle, Washington.

BUILDING COSTS MUST COME DOWN!

DAREX
AEA

HOW TO SAVE MONEY AND GET BETTER CONCRETE

Here are a few things DAREX AEA will do:

1. **Greater workability—speeds placing.**
2. **Prevents segregation of aggregates—minimizes honeycombing.**
3. **Reduces bleeding—green shrinkage—speeds finishing.**
4. **Saves sand without loss of yield.**
5. **Improves durability of hardened concrete.**

This essential ingredient for BETTER CONCRETE is added at the mixer—offers great savings on the job—at ready mix plants . . . in concrete block and pipe plants.

★
APPROVED BY:

- Bureau of Reclamation
- U. S. Army Engineers
- Public Roads Administration
- Other public bodies, including the highway departments of most states, including all the 11 Western States.

DAREX AEA, the ***approved air-entraining agent,*** will save you money and reduce your costs in many ways. It is a liquid that comes ready to use, and is safe and easy to handle. ***It costs but a few cents per cubic yard.*** DAREX AEA gives you improved workability, permits hauling in open dump trucks without segregation, makes concrete easier to place and assures quicker finishing.

SIMPLE DISPENSERS AVAILABLE

ASK YOUR NEAREST DEALER ABOUT DAREX:

Pacific Coast Aggregates, San Francisco; Baldwin Hills Building Material Co., Los Angeles; Denver Fire Clay Co., Salt Lake City; Baker-Thomas Lime & Cement Co., Phoenix; Ray Corson Machinery Co., Denver; Mason's Supply Co., Portland.

Charles R. Watts & Co.

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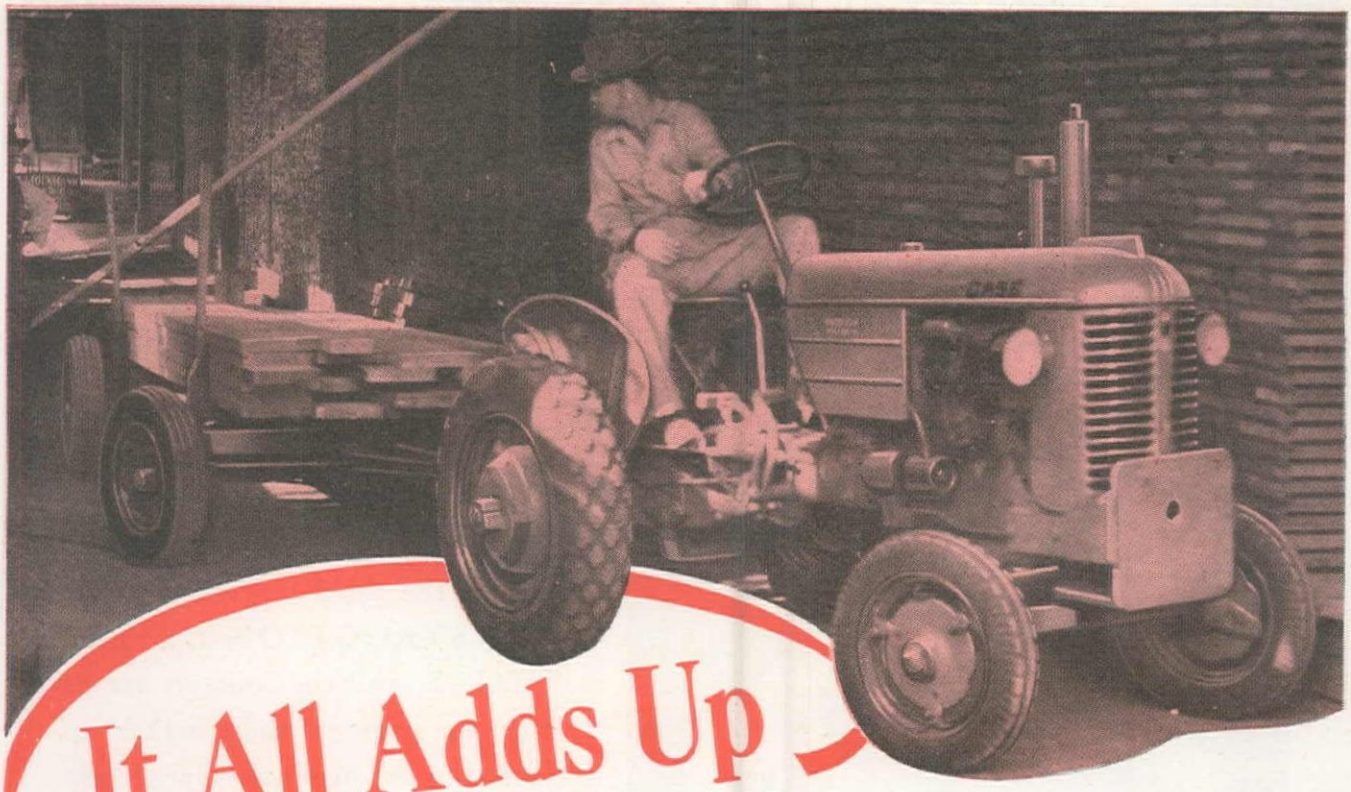
DISTRIBUTORS FOR DEWEY-ALMY CHEMICAL CO. IN 11 WESTERN STATES.



It All Adds Up

TO GETTING THINGS DONE FASTER . .

Why does work go so swiftly, so smoothly, with a Case Industrial Tractor? In a nutshell, it's because these tractors don't have to be "babied." They're quick to start and ready to pull . . . right now! They have clutches that take hold like velvet, get going without faltering. The Case valve-in-head engine is a "lugger" . . . pulls as strong when slowed down as at full speed . . . saves countless seconds by skipping a lot of gear shifting. And then Case Industrial Tractors have ENDURANCE—more freedom from minor mechanical difficulties, long working life before major overhaul.

Shown here is Model "VAI," smallest of four basic sizes that cover a weight range from 2500 to more than 10,000 pounds, master a myriad jobs on streets and highways, in docks, warehouses, and industrial plants. J. I. Case Co., Oakland, Los Angles.

CASE ★ ★ ★

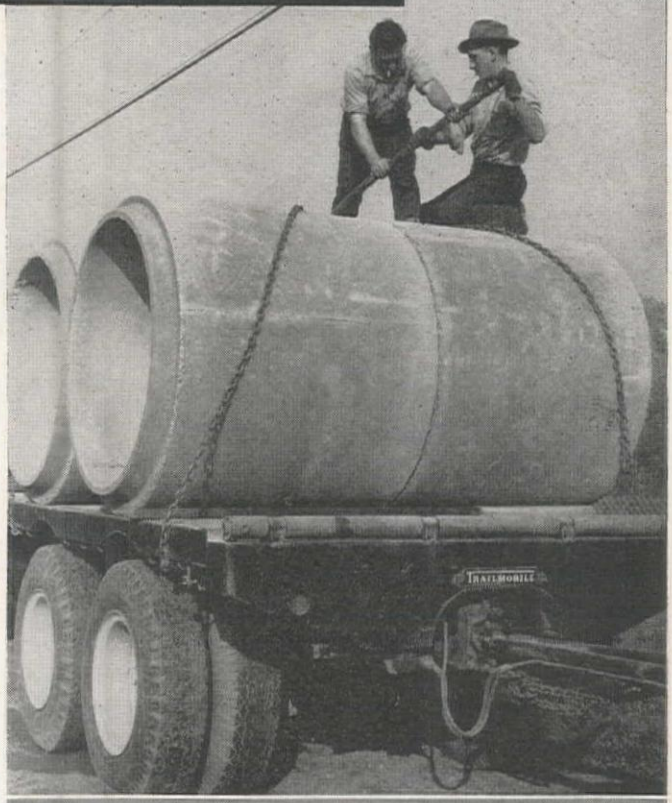
See Your Case Industrial Dealer for latest information on the four sizes of Case industrial tractors, also on cranes, loaders, mowers, snow-plows, and all manner of tractor-mounted equipment. Take advantage of his trained personnel and shop facilities to keep your present equipment ship-shape. Let his varied experience help plan purchases of new equipment for the long pull ahead. Case "VAI" tractors are in regular production; keep in touch with your dealer about outlook for larger sizes.

CONTRACTORS LIKE TRAILMOBILES

TRAILMOBILES have long been tops in the construction industry in hauling steel beams and girders; timbers, piling and finished lumber; cement, aggregate, culverts, sewer pipe and in moving heavy equipment from one job to another.

TRAILMOBILES are specifically designed and constructed for exactly the kind of hauling they are expected to do, that is why they are universally successful in service. Contractors especially like their loading characteristics—the bed of the TRAILMOBILE remaining level while loading and unloading.

Shown here is one of the TRAILMOBILES operated by DIAMANTINE BROS. of Hayward, California, used in hauling lumber, machinery and concrete pipe throughout Northern California and into the Sierra Nevada Mountains. If your loads are long and heavy, and you want to barrel along with a minimum of mechanical trouble—BUY TRAILMOBILES. In just a short time you will understand why—"the trend is toward TRAILMOBILE."



THE TRAILMOBILE COMPANY
BERKELEY, CALIFORNIA

TRAILMOBILE

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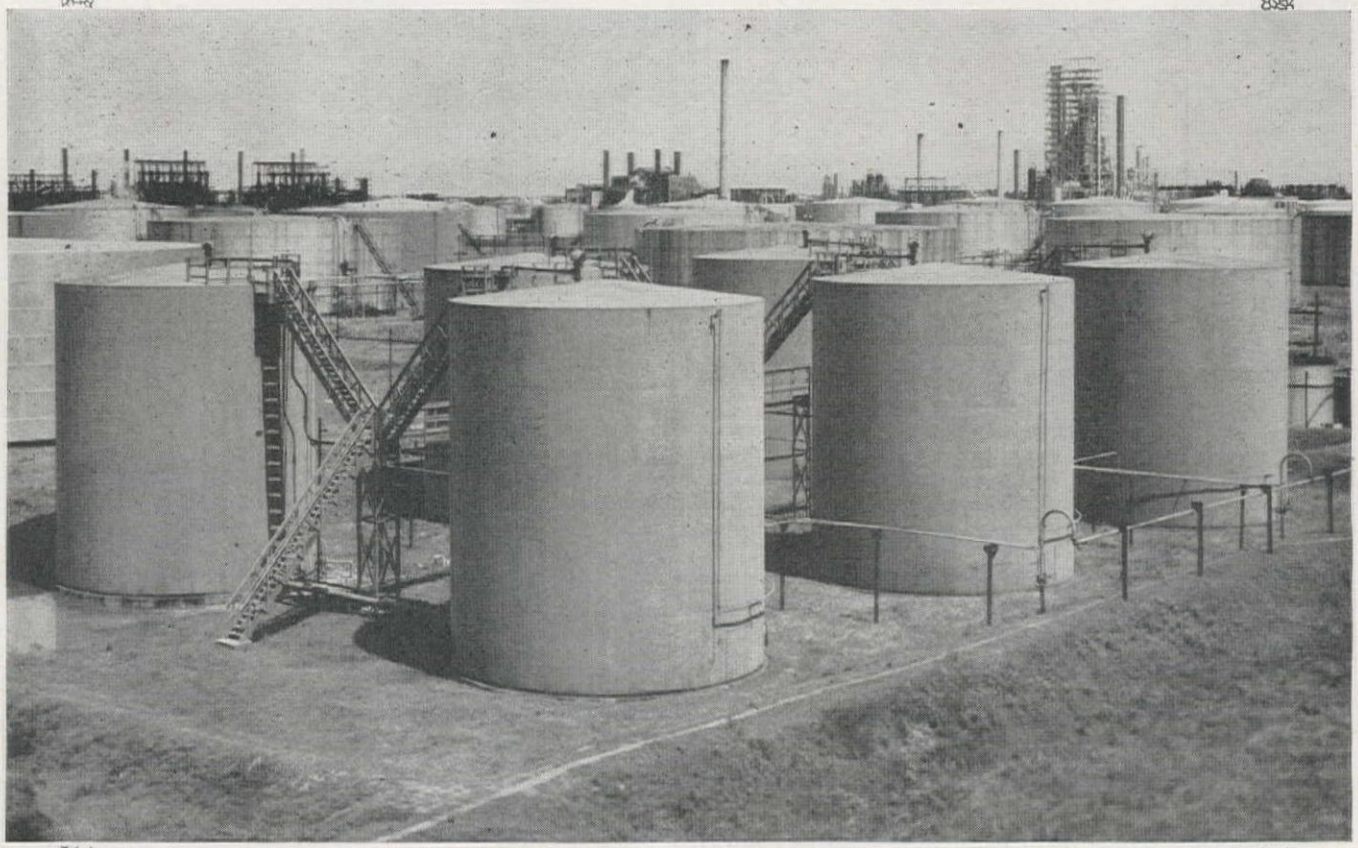
NUMBER ONE STORAGE FACILITIES

. . . for the handling of oil, water, molasses alcohol and other liquids at industrial plants



HORTON WELDED STEEL TANKS

Horton steel storage tanks of welded construction are a familiar sight throughout industry. The view above shows six 36-ft. diam. by 40-ft. high Horton cone roof tanks at an oil refinery.

Most Horton flat-bottom tanks are designed and built in accordance with API specifications. We are, however, equipped to build tanks of this type to meet special requirements. Standard sizes range from 500 bbls. to 150,000 bbls. Constant improvement in welding technique and equipment has made it practical to use welded construction at almost all locations. We can also furnish riveted tanks when necessary.

Tanks that are used to store water, asphalt, fuel oil, etc. are usually equipped with cone roofs. If desired, however, structures 41 ft. or less in diam. may be built with umbrella roofs. When tanks are to be used for crude oil, gasoline and other volatile liquids, they are usually equipped with special evaporation prevention roofs such as Horton Double-Deck Floating Roofs and Horton Liquid-Seal Lifter Roofs.

A minimum amount of maintenance is required to keep Horton all-welded steel tanks in good condition for years. Usually a coat of paint applied regularly to prevent rusting is all that is necessary. When figuring on equipment of this type get quotations from our nearest office.

CHICAGO BRIDGE & IRON COMPANY

SAN FRANCISCO • ATLANTA • BIRMINGHAM • PHILADELPHIA • DETROIT • HAVANA
CHICAGO • HOUSTON • NEW YORK • CLEVELAND • TULSA • LOS ANGELES

Plants in BIRMINGHAM, CHICAGO, and GREENVILLE, PENNSYLVANIA

WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
March, 1947 Vol. 22, No. 3

Just a Minute, Mr. Congressman!

A FEW DAYS AGO we received a card from one of our readers, quoting another publication to the effect that citizens must see the futility of demanding reductions in government spending, while clamoring for federal funds for their own local projects. The editorial and our reader are both right, of course.

But they, and you, Mr. Congressman, must analyze the words "government spending" a little bit. There is necessary public spending and there is wasteful public spending. And sometimes they're pretty hard to differentiate, because departments of government which have legitimate "necessary" expenditures have during recent years added functions which are "wasteful," and when this latter spending is threatened, they parade before you Congressmen the "necessary" work they do as a basis for asking your indulgence in the less necessary.

The Bureau of Reclamation is a case in point, we feel. They operate one of the finest, if not the very best, engineering department in this country, and they have built and are building some of the most monumental, most valuable and most "necessary" projects imaginable. For you to cut the funds for these projects would be a major disaster. In general these funds are only loans, anyway, and are all repaid, (see "Irrigation Pays Its Way" below) or at least they're supposed to be.

But during the years the Bureau has been under the control of curmudgeon Ickes and his successor Krug, who would sell his own department down the Authority river, a great many UNnecessary, even wasteful expenditures have been added to the department. It has, for instance, made the generation of electricity the primary function of the organization whereas the law indicates power was meant to be a secondary issue to the irrigation of dry land, and which it was hoped would assist in repaying the cost of the irrigation. Instead of digging canals, it has spent much money in building power transmission lines parallel to existing lines.

The Bureau has spent a lot of time writing reports and devising ways of making farming **less** efficient, by breaking up large going farms into small garden plots (40 ac. in some places, 160 ac. in others). It has spent time, money and labor in devising ways of taking over functions of the Army Engineers and Department of Agriculture. It has hired great staffs of economic specialists and socialist organizers for purposes never dreamed of by the authors of the law.

You should make sure that these secondary and "wasteful" expenditures by the Bureau are eliminated, but you dare not fail to support financially the many valuable and "necessary" projects the Bureau is constructing.

The Army Engineers, Mr. Congressman, merit your support, perhaps even more than the Bureau. Flood control has been deemed a national responsibility. Hundreds of flood control projects in all parts of the country have been studied by the Army Engineers and their construction justified both on the basis of engineering feasibility and economic necessity. They have in fact been authorized by your body. Every day of delay in their construction brings closer the deaths of hundreds of people, the destruction of property worth millions of dollars. To refuse the money is the falsest, most hypocritical kind of false economy.

This agency, too, has some plans that are **not** necessary. Navigation schemes in places where water navigation is not of particular importance; construction of military facilities only a few miles from existing structures that would subsequently be torn down; flood control and power projects not justified economically. As in the case of the Bureau, you must weed out the "wasteful" elements, but DON'T, Mr. Congressman, PLEASE DON'T simply make an over-all slash in funds without careful review of the needs.

Similarly the Civil Aeronautics Administration, with its program to improve the nation's airports, many now virtual death traps; the Public Roads Administration, endeavoring to eliminate the hazards of auto travel; the Geological Survey, with its most "necessary" stream gaging and mapping programs; the Soil Conservation Service, struggling to preserve the farm land we now have; and other agencies like these are in need of funds for "necessary" programs, and you will be considerably more unfaithful to your nation if you deny them, than if you just blindly "reduce the budget."

By the time this appears, doubtless the budget ceiling will have been compromised, but beneath that ceiling, you can still apportion the appropriations. TVA boasts of its self-support, though it has never yet been evident, for they have annually asked you for funds—let them begin that self-support this year. Give them nothing. They'll quickly eliminate the traveling evangelists that have been carrying their doctrine to other areas. You are eliminating the outmoded and unnecessary OPA—good! Let's cut down on free funds to the beggar nations of Europe. Let them, like TVA, go to work and become self-supporting. We wouldn't presume to advise you on funds for the armed services, but we suspect there's considerable room for saving. You should examine this very carefully. Ask the Veterans Administration why it's building great hospitals all over the country while at the same time existing Army and Navy hospitals are being sold as surplus. There's plenty of room for saving, Mr. Congressman, without destroying the "necessary" works.

Irrigation Pays Its Way

MOST SIGNIFICANT event in the history of Western irrigation took place last month at Yakima, Wash., when the water users of the Tieton division of the Yakima irrigation project paid the last installment of the construction costs to the Bureau of Reclamation, 37 years after the Bureau (then the Reclamation Service) undertook to construct the water storage, transmission, and distribution facilities. At that time the area west of Yakima was largely sage brush-covered hills good for nothing but grazing a few cattle.

The Bureau of Reclamation spent $3,597,479 to bring water to some 21,500 ac. of land in the Tieton division. In the 34 years since the first construction was completed this division has produced crops with an average annual value of $3,880,771, which is well in excess of the total cost of constructing the irrigation facilities. Now the federal government has been completely repaid by those who benefited by the original expenditure.

To us this seems to be the ultimate argument in favor of continuing development of irrigation in the West. Four decades ago those acres had almost no value. The nation loaned some money, and increased the value of the land immeasurably. In the long run it has cost no one anything, yet the entire country has benefited.

Critics of the irrigation program are too prone to consider appropriations for reclamation to be all outgo when in reality they are largely loans that will eventually materially contribute to increasing of the national income.

As a matter of fact, a quarter of all construction costs on major irrigation projects in the Pacific Northwest has been repaid to the federal government and payments are less than 2 per cent delinquent, while the record is almost as good in all of the 17 Western states with less than 3 per cent of the payments delinquent on a total outlay of $335,700,000.

This Illinois Limestone Plant with its 25″x40″ Primary Jaw Crusher, 10″x36″ Intermediate Jaw Crusher and 40″ x 22″ Roll Reduction Crusher has an hourly production of from 125 to 150 tons, ordinarily divided equally between Road Stone and Agricultural Limestone. If desired, the Crushers can be adjusted to produce all "Agstone." The Plant includes a 30″ x 84′ feed conveyor, 30″ x 48′ return conveyor, 4′ x 10′ triple deck vibrating screen, and 20-yard two-compartment bin.

Operating efficiency of the Plant is high. Exclusive Austin-Western features of Crusher design insure maximum output. The finest of construction throughout insures uninterrupted operation and low upkeep costs.

Each Austin-Western Crushing and Screening Plant is especially designed for the job it has to do. Our Engineering Department will be glad to discuss your problems, and suggest the size and type of Plant best suited to your particular needs.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

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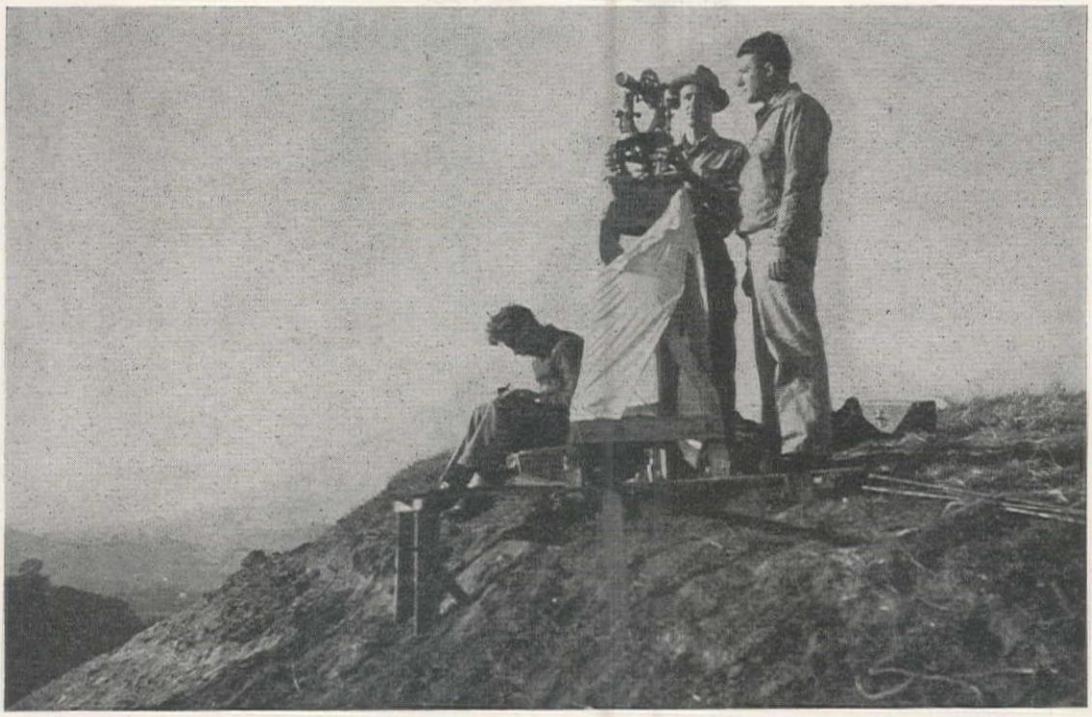
WESTERN CONSTRUCTION NEWS
MARCH • 1947



SETTING UP theodolite preparatory to night observations in the East Bay area triangulation survey, are J. H. Brown, recorder, Bruce Campbell, observer, and Bill Hansen, B-micrometer reader. Most stations are on prominent hilltops.

East Bay Triangulation Net

Cities and Districts on east shore of San Francisco Bay join with Coast and Geodetic Survey to provide first order triangulation net and base lines upon which all property surveys in area may be based—Angles are read 16 times, with maximum permissible closure error set at 3 sec.

By W. R. McLEAN
Senior Civil Engineer,
East Bay Municipal Utility District,
Oakland, Calif.

and S. P. HAND
Geodetic Engineer,
U. S. Coast and Geodetic Survey

THE EAST BAY Municipal Utility District, with the cities of Oakland, Alameda, Berkeley, Richmond, El Cerrito, Emeryville, Piedmont, San Leandro, and Contra Costa and Alameda Counties of California, are cooperating in a joint project with the United States Coast and Geodetic Survey to establish a system of precise Geodetic control and coordinates.

In 1932, after the East Bay Municipal Utility District had acquired the various properties of the East Bay Water Company, the District established a fourth order triangulation scheme with plane coordinates for the purpose of mapping the lands and watershed areas. The existing United States Coast and Geodetic Survey triangulation network was used as the base, with the station "Grizzly Peak" as the origin of coordinates. Grizzly Peak was set as 50,000 North and 50,000 East on the coordinate system. Approximately 25 stations were established at that time and tied to the Coast and Geodetic Survey stations along the Bay, such as "Brooks Island, Richard, San Pablo Ridge, Franklin" and others. Most of the stations established at that time were located along the Oakland and Berkeley hills, with a few stations in the Orinda and Lafayette areas. In recent years this triangulation scheme has been expanded to more than 100 stations, of which 30 stations may be classed as primary, and the remainder as secondary or supplementary stations. All of the work was done with standard transits and day observations, therefore the accuracy compared only with third or fourth order work, or about 1 in 5,000. This scheme has served the purpose of the Utility District very well as it was more accurate than most of the existing cadastral surveys in the area.

Many of the stations were located and used by the U. S. Army during 1942 while mapping this area. In addition, many of the local engineers and surveyors have used the stations for position and bearing. However the accuracy of the scheme was such that it could not be used to any advantage for city surveys and a scheme with a higher degree of accuracy was needed. Rural areas were being subdivided, land values were rising rapidly, city property was becoming highly developed and a common coordinate system was needed in the area, upon which to base all future surveys.

Establishment of the new survey

On Oct. 8, 1945 a meeting was held of all the City and County Engineers at which time Captain E. H. Pagenhart, Supervisor of the Western District of the United States Coast and Geodetic Survey (retired) was present. Capt. Pagenhart advised the group that the Survey was eager to cooperate with municipalities on geodetic surveys.

Subsequently on Dec. 13, 1945, L. G.

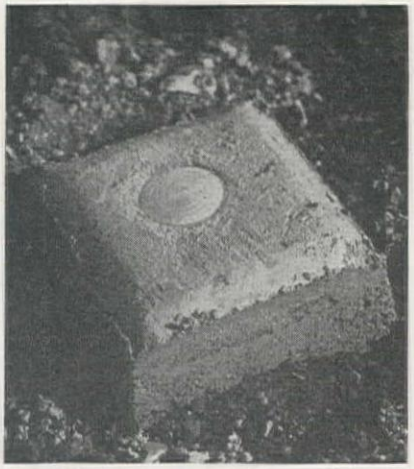
Simmons, Principal Geodetic Engineer of the Survey arrived in the Bay area and began the reconnaissance survey. He completed his survey and presented the results to the group on Jan. 24, 1946. The group of engineers were in favor of proceeding with the project and the Director of the Coast and Geodetic Survey in Washington, D. C. was requested to prepare an estimate of cost for the work outlined in the Simmons report. Briefly the cost was estimated at $60,200 which was the amount to be raised among the local group. The Survey agreed to furnish the skilled personnel, instruments, steel towers, monuments, etc., compute and publish all data. The Survey's share is approximately equal to the contribution from the local group. The estimated time for doing the field work was 5 months. Because of weather conditions it was essential that the work be started in the early fall and completed during the winter as this period was thought to be the most favorable for night observations in the Bay area.

Simmons, in his report estimated approximately 120 triangulation stations in the network with about 100 first order traverse stations in the city of Alameda. To proportion the cost of the project among 12 agencies in order for each to pay a fair share was difficult. The needs of each city were different and the stations were more numerous in the cities than in the counties, where large areas are undeveloped. The City of Alameda, being entirely flat, could not be adequately served by a triangulation scheme and it was decided to establish about 30 mi. of first order traverse throughout the city, tied to the triangulation scheme with five stations.

The cost was finally computed on a monument basis, each agency to pay approximately according to the number of monuments established and the value within its boundaries. On this basis, the East Bay Municipal Utility District, the cities of Alameda and Oakland, Contra Costa and Alameda Counties each contributed about $10,000 as their share, with the remainder contributed by Richmond, Berkeley, Piedmont, Emeryville, El Cerrito and San Leandro in the amount of $1,000 each.

The United States Coast and Geodetic Survey may not accept funds from any outside agency, therefore it became a problem to designate some agency to sponsor the project in order to obtain the necessary personnel and disburse the funds. Finally the group requested that the Utility District sponsor the project. J. S. Longwell, Chief Engineer and General Manager of the District, willingly agreed to present this request to his Board of Directors, and they in turn consented to sponsor the project. W. R. McLean was appointed as chairman to coordinate the work between the sponsor and the Coast and Geodetic Survey.

On Aug. 2, 1946 Capt. O. W. Swainson, Supervisor of the Western District, received instructions to proceed. During September 1946 the reconnaissance party began operations under O. S. Risvold. Lt. Cmdr. W. M. Gibson was later assigned to the project as officer in charge, with S. P. Hand, geodetic engineer, as his principal assistant. On Feb. 8, 1947 Lt. Cmdr. Gibson was transferred to other duties and supervision of the project was transferred to Mr. Hand.



CLOSE-UP view of brass disk in concrete monument, as used for triangulation stations in the survey. Below are shown the four types of markings used on disks in the East Bay.

Area of the survey

Essentially the general overall scheme as laid out by Mr. Simmons covers an area bounded on three sides by established triangulation with the southeast corner of the area controlled by the old station "Mocho." The center of the area is controlled by ties to the station "Mt. Diablo." This station and "Rocky Mound" established by the Survey in 1851 and 1876, respectively, are the oldest stations in the scheme.

The total area to be controlled is approximately 1,500 sq. mi., of which only about 100 sq. mi. might be considered metropolitan area. The total number of stations required, including the established stations that must be occupied is 130. (This does not include the traverse stations in the city of Alameda.) Approximately 40 stations are located in the metropolitan area from Richmond to San Leandro; 50 stations are in the areas of most importance and development in the two counties, and the remainder are existing stations in the area.

The major portion of the area to be controlled under the program is of a low mountainous type ranging from sea level to a maximum elevation of nearly 4,000 ft. The area is fairly free from timber, making the use of steel towers unnecessary except on a small number of stations.

The problem of length of control is difficult on a project of this nature, in that there exist so many established lines, having varying degrees of accuracy. The various cities in the metropolitan area desire the highest degree of accuracy, probably on the order of one part in 100,000. In order to obtain this accuracy it has been found necessary to establish three base lines within the scheme.

Provision has been made for a base line in the Livermore Valley along the Southern Pacific Railroad between Livermore and Pleasanton. This base has a length of about 3.9 mi. Two bases are provided in the metropolitan area, one along the Western Pacific Railroad, parallel to San Leandro Blvd., between High St. and 105th Ave., the other along the Southern Pacific Railroad parallel to the East Shore Highway between Gilman St. in Berkeley and 62nd St. in Emeryville. These bases have a length of 2.65 mi. and 2.5 mi., respectively.

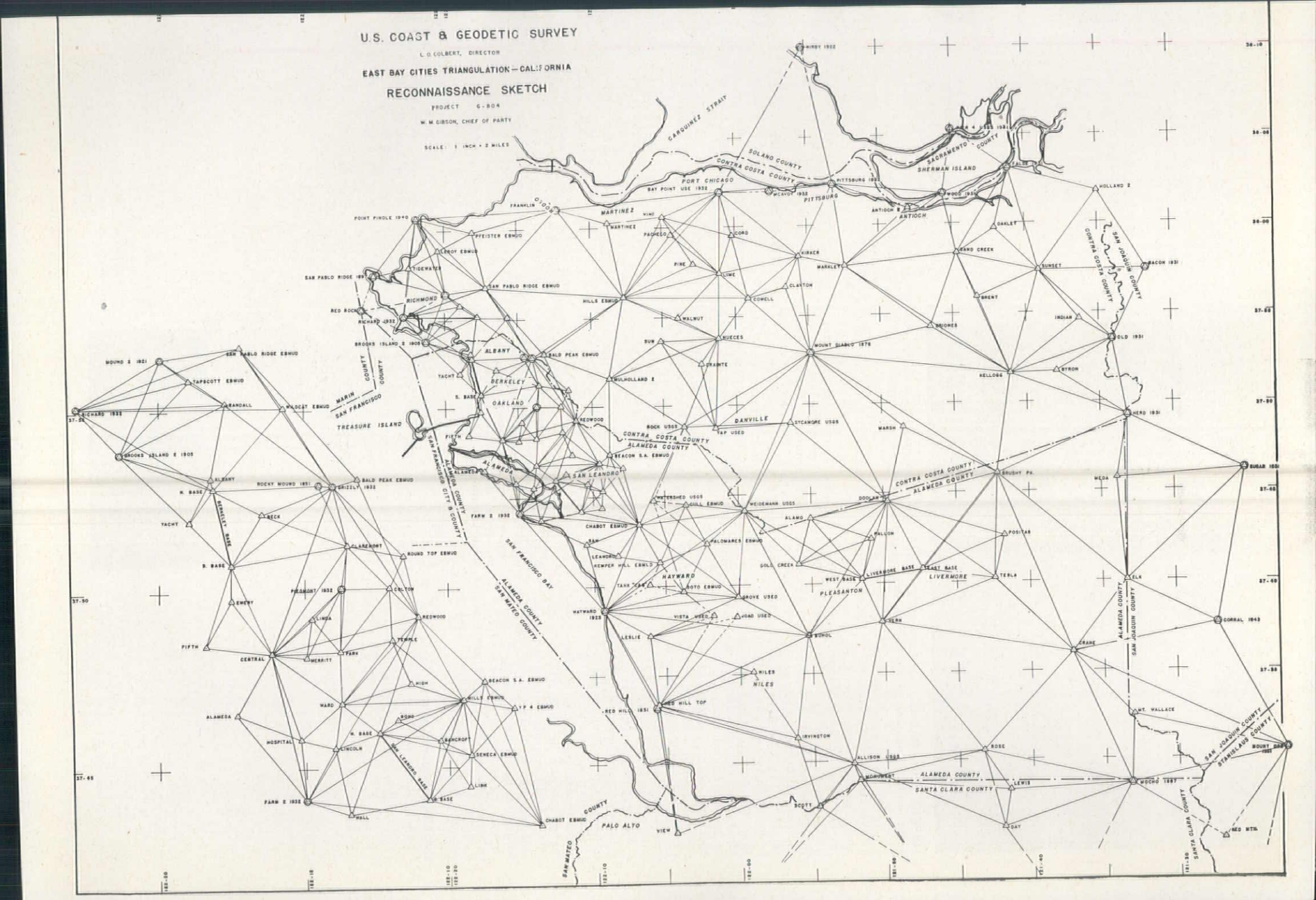
In the City of Alameda, the general plan includes three traverses lengthwise within the city as follows: Buena Vista Ave., from a connection with Main St. east to Northwood Dr., thence to Gibbons St., thence to High St.; Central Ave. from a connection with Main St. east to High St.; south along Sherman St. from Central Ave. to San Jose Ave., thence east on San Jose Ave. to High St. Six cross lines are also planned, along High St., Oak St., Grand St., Charles St., Webster St., and Main St. The last two lines are extended northward to permit an east and west traverse to be run across to form a loop. The five triangulation stations established in Alameda are distributed so as to properly control the traverse area.

Purpose of the survey

The purpose of the survey is to establish points throughout the cities and counties involved that will serve as control points for the local surveys of the various city and county engineers. Such control is essential for well coordinated surveys that cover any large area, so as to decrease accumulated errors and to detect specific errors in any particular survey.

Suppose that the reader was required to make a drawing to scale of the room in which he is sitting, showing the positions of all the various pieces of furniture. It would be necessary for him to know the distances between the corners; to show the size of the room, and to locate the articles in their proper places. He could then measure from two adjacent corners to each piece of furniture, or he could measure along a wall from one corner to a point opposite each article, then from the wall to the

DETAILED map of entire area appears to the right, showing location of all triangulation stations. Net at left is expanded view of the municipal stations.


U.S. COAST & GEODETIC SURVEY
L. O. COLBERT, DIRECTOR
EAST BAY CITIES TRIANGULATION — CALIFORNIA
RECONNAISSANCE SKETCH
PROJECT G-804
W. M. GIBSON, CHIEF OF PARTY
SCALE: 1 INCH = 2 MILES
CARQUINEZ STRAIT
SOLANO COUNTY
CONTRA COSTA COUNTY
SACRAMENTO COUNTY
SHERMAN ISLAND
PORT CHICAGO
BAY POINT USE 1932
MCAVOY 1932
PITTSBURG
ANTIOCH
OAKLEY
HOLLAND 2
SAN JOAQUIN COUNTY
CONTRA COSTA COUNTY
BACON 1931
SUNSET
SAND CREEK
KIRKER
MARKLEY
CLAYTON
COWELL
BRENT
INDIAN
OLD 1931
BRIONES
MOUNT DIABLO 1878
KELLOGG
BYRON
HERD 1931
MARSH
SUGAR 1931
MEDA
BRUSHY PK.
CONTRA COSTA COUNTY
ALAMEDA COUNTY
DOOLAN
WEIDEMANN USGS
WATERSHED USGS
GULL EBMUD
ALAMO
POSITAS
PALOMARES EBMUD
GOLD CREEK
WEST BASE
LIVERMORE BASE
EAST BASE
LIVERMORE
TESLA
PLEASANTON
ELK
CORRAL 1943
SAN JOAQUIN COUNTY
ALAMEDA COUNTY
CRANE
SUNOL
VERN
GROVE USED
JOAQ USED
VISTA USED
HAYWARD
HAYWARD 1923
LESLIE
TANK 2
ROYO EBMUD
KEMPER HILL EBMUD
SAN LEANDRO
CHABOT EBMUD
FARM 2 1932
SAN FRANCISCO BAY
ALAMEDA COUNTY
SAN MATEO COUNTY
SAN FRANCISCO COUNTY
ALAMEDA COUNTY
CONTRA COSTA COUNTY
ALAMEDA COUNTY
ROCK USGS
AP USED
DANVILLE
SYCAMORE USGS
BEACON S.A. EBMUD
REDWOOD
FIFTH
ALAMEDA
SAN LEANDRO
MULHOLLAND 2
TRAMPE
SUN
NUECES
WALNUT
HILLS EBMUD
SAN PABLO RIDGE EBMUD
PINE
LIME
MARTINEZ
WINE
PACHECO
CORD
MARTINEZ
FRANKLIN
POINT PINOLE 1940
PFEISTER EBMUD
ROY EBMUD
TIDEWATER
SAN PABLO RIDGE 1931
RICHMOND
RED ROCK
RICHARD 1932
BROOKS ISLAND 2 1905
ALBANY
BERKELEY
OAKLAND
S. BASE
YACHT
TREASURE ISLAND
MARIN COUNTY
SAN FRANCISCO COUNTY
MOUND 2 1921
SAN PABLO RIDGE EBMUD
TAPSCOTT EBMUD
RANDALL
WILDCAT EBMUD
RICHARD 1932
BROOKS ISLAND 2 1905
ALBANY
W. BASE
YACHT
ROCKY MOUND 1851
GRIZZLY 1932
BALD PEAK EBMUD
BECK
BERKELEY BASE
CLAREMONT
ROUND TOP EBMUD
S. BASE
EMERY
PIEDMONT 1932
CALTON
LINDA
REDWOOD
FIFTH
CENTRAL
MERRITT
PARK
TEMPLE
HIGH
BEACON S.A. EBMUD
HILLS EBMUD
YP 4 EBMUD
WARD
ALAMEDA
BOND
W. BASE
HOSPITAL
LINCOLN
BANCROFT
SENECA EBMUD
SAN LEANDRO BASE
LINK
S. BASE
FARM 2 1932
WELL
CHABOT EBMUD
SAN MATEO COUNTY
PALO ALTO
VIEW
RED HILL 1851
RED HILL TOP
MILES
NILES
IRVINGTON
ALLISON USGS
MONUMENT
ALAMEDA COUNTY
SANTA CLARA COUNTY
LEWIS
DAY
ROSE
MT. WALLACE
MOCHO 1887
SAN JOAQUIN COUNTY
STANISLAUS COUNTY
MOUNT OSO
RED MTN.
SANTA CLARA COUNTY
37-30
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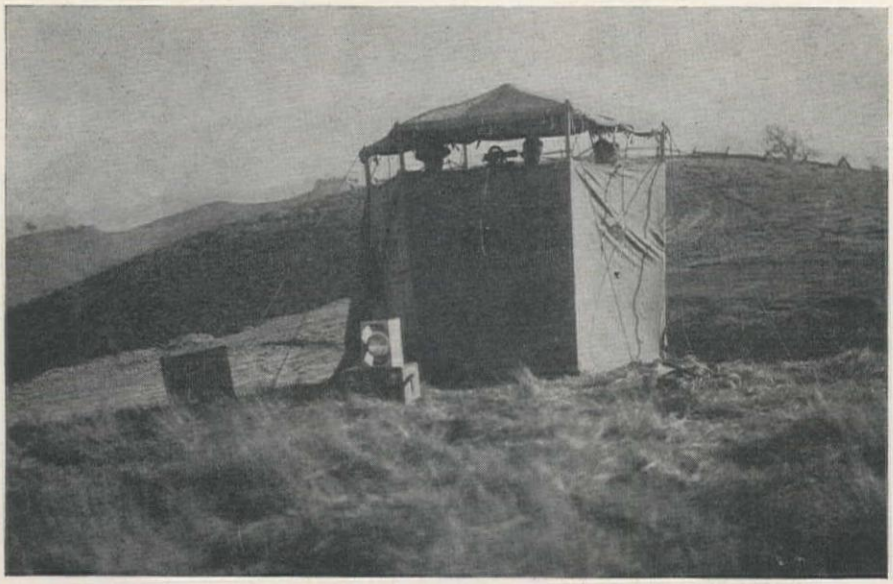
121-40
121-30



OBSERVATION PARTY ready for work. Tent protects both instrument and observers from wind and weather. Signal light, battery operated, shown in foreground.

article. Hence, the corners of the room would be his control points. Now suppose that the area to be mapped is much greater, the area of a large city, and he is required to locate valuable pieces of property in their exact places. Again it is necessary that he have at least one point from which to make his measurements. If he has only one, he must start each separate survey from that one point, and he must always measure back to it to check the accuracy of his survey. This involves a lot of work, time, and money. It is much simpler to have a lot of known points scattered over the city from which he can start.

City engineers, as well as independent local surveyors, have this problem continually before them. If each surveyor has his own control points that are not correlated with others, the resulting confusion can well be imagined. As a city grows and the value of property increases, the need for precise control multiplies. In laying out work covering large areas, such as city streets, subdivisions, water and sewer lines, errors can be held to a minimum with well spaced precise control points.

Establishing survey points

There are two methods of establishing these control points: triangulation and traverse. Traverse is better suited to flat terrain, and consists in directly measuring the distance and direction from one point to the next adjacent one; while triangulation is better adapted to rough terrain, where visibility is more easily obtained from one point to a distant one, and where measurement along the ground is impractical.

Triangulation consists of starting from two points at the ends of a line of known length (either a measured base or a line whose length has previously been determined by triangulation), and selecting other points over the area that will form a network of triangles. The points are called triangulation stations, and each station is the vertex of a triangle. The angles at each station are accurately measured, then with the line of known length, the distance and direction to each new station is computed.

Each station is marked by a bronze disk, either set in a concrete post embedded in the ground, or cemented in a drill hole in rock. The name of the station, and the year it is established are stamped on the disk. Whenever possible another mark is set directly beneath the station mark, and about four feet deep, to preserve the point should the surface mark be destroyed. Two reference marks, also bronze disks, are established at each station to aid in the recovery of the mark. Distances and directions to these are measured and published.

An azimuth mark is set for each station, at some distance away, provided the station is not conveniently intervisible with another station. The azimuth of this mark as measured at the station is determined and published to supply the local engineer with a starting bearing. These marks are valuable to the community in which they are located, and the public should try to preserve them. However, one of the valuable features of triangulation control is that, although a mark may be entirely obliterated, it can be replaced in its exact position. Indeed if any number of marks are destroyed, they can be replaced, although at considerable expense, provided they have been connected to the triangulation network of the Coast and Geodetic Survey.

DOUBLE STEEL tower, 90 ft. high, used when required to elevate instrument and observer. The theodolite is supported on inner tower, observer on the outer, thus protecting instrument from vibration.

The Coast and Geodetic Survey has, for more than a hundred years, been establishing such controls over the United States, and Canada and Mexico have connected their triangulation to it. The work is based on geodetic positions, which means the relative position of each station on the surface of the earth; that is, its latitude and longitude. This is determined from the distances and directions of each new station from two or more old stations whose positions are known. The computations take into consideration the fact that the earth is round, whereas plane surveys of small areas can ignore the fact.

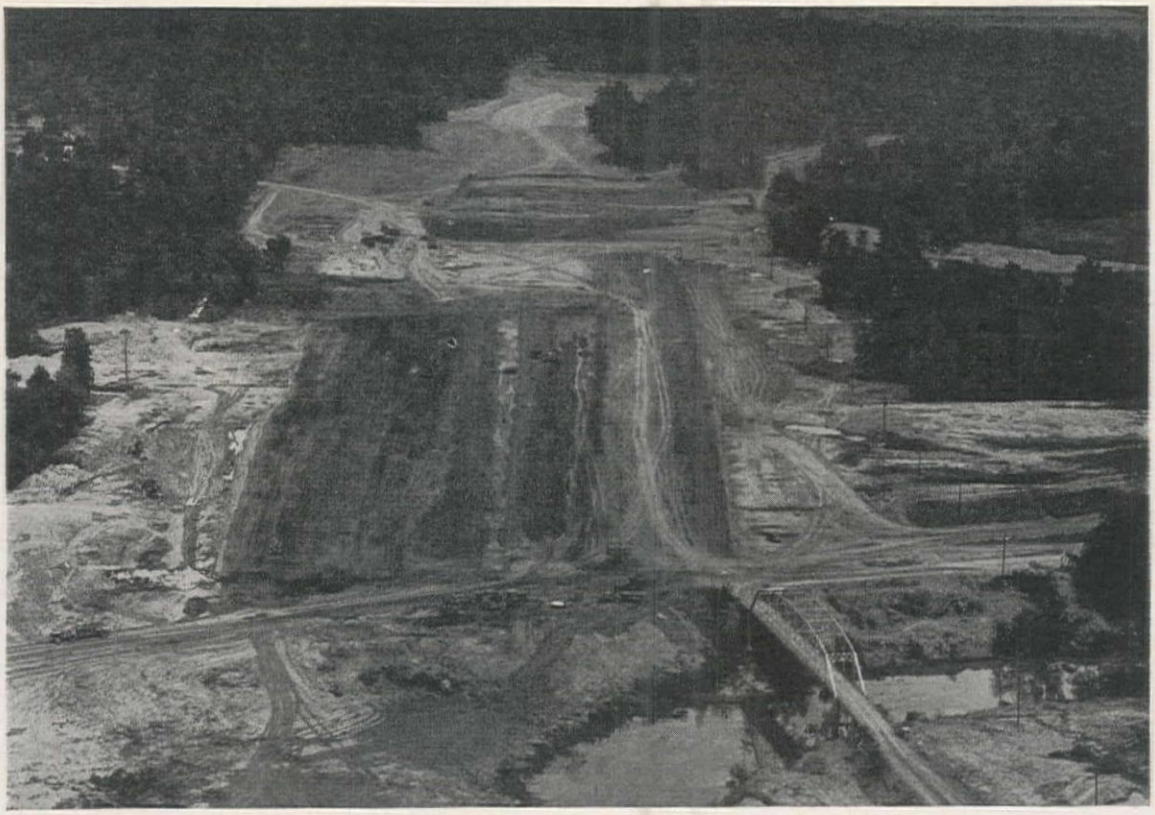
C. & G. S. field methods

The field methods of the Coast and Geodetic Survey are being used, with some refinements to obtain an accuracy of one part in 100,000. This means that for each mile the error should not exceed 0.6 in., so it is necessary that all measurements be made with the greatest of accuracy. A precise theodolite, with two vernier micrometers reading to one second, is used to measure the angles. Each angle is measured with 16 positions of the circle, or actually 32 times; the average of these is then taken out to .01 sec. Triangle closures are held to a maximum of 3 sec., with an average closure of not to exceed 1 sec. When there are two or more ways to compute the length of a single line, the check between these computed lengths is held to a high degree of rigidity.

The observations are made on lights at night, to avoid refraction caused by the heat of the day. Instruments and lights are accurately centered over the station marks. The accuracy of the triangulation is checked by connecting to the three base lines previously mentioned. These bases will be measured with tapes of invar, which have a low coefficient of expansion.

The theodolites are mounted on firm supports, which may be either wood stands four feet high or steel towers as high as 110 ft. The low wood stands are used on high ground free of obstructions such as trees. Steel towers are used where it is necessary to elevate the instrument and observer over intervening objects that might obstruct the line of sight. Each tower is in reality two; an inner tower to support the theodolite, and an outer one entirely disconnected from the inner, to support the observer. Thus no movement of the observer will disturb the instrument.

(Continued on page 116)



AIR VIEW of the main embankment at Wister Dam site. Tractors and Euclids in center foreground are placing fill at approximate elevation 462. Poteau River is in the foreground, with the observation pavilion in upper center.

Poteau River Flood Control

Flood protection for Oklahoma mining section to be provided with completion of flood-control reservoir at Wister Dam site—Initial conservation pool to have surface area of 4,000 ac. and a capacity of 30,000 ac. ft.—Construction of storage pool for temporary flood use also planned

By EUGENE E. ZELLER
Engineer-Economist,
Oklahoma Planning and Resources Board,
Oklahoma City, Okla.

WISTER DAM site is located at mile 61 on the Poteau River in LeFlore County, Oklahoma, about seven miles northwest of Heavener, and 47 mi. southwest of Fort Smith, Ark. This portion of Oklahoma lies considerably east of the 98th Meridian and the paramount problem is flood control. The problem is unique in that it involves considerable coal mine interests. Backwater floods from Poteau River have caused large damages to coal mines near the mouth of Brazil Creek, a tributary. The flood-control reservoir now under construction at Wister Dam site, under supervision of the Corps of Engineers, will provide a high degree of flood protection for the mining sections in the area. Wister, Okla., which lends its name to the site, is about two miles south on U. S. Highways Nos. 270 and 271, and is served by a branch line of the St. Louis - San Francisco Railroad and the main line of the Chicago, Rock Island and Pacific Railway.

The Wister project was authorized by the Flood Control Act of 1938 as one unit for flood control and other purposes in the Arkansas River Basin, and funds for initiation of construction were made available by Congress in the Deficiency Appropriation Act approved Dec. 28, 1945. The reservoir area, including a permanent pool covering 4,000 ac., will be open to the public for recreational purposes and a portion of the area will also serve as a wildlife refuge. Conservation of water for beneficial use is recognized by the inclusion of a water supply outlet for future use.

The reservoir will also provide a high degree of flood protection to 42,000 ac. of land in the Poteau River valley below the dam site and as a unit in the Arkansas River basin will aid in protecting areas in the flood plain of the Arkansas River below the mouth of Poteau, which flows into the Arkansas at Fort Smith, Ark.

Major floods occurred on the Poteau River in August and October 1925, April 1927, May 1930, May and June 1935, February 1938, April 1939, May 1943, and March, May and June 1945, while many minor to moderate floods were also experienced during that period. The flood having the maximum peak flow occurred at the Wister site in June 1935 while the flood having the maximum volume occurred in 1945. These floods of recent record lend emphasis to the need for completing the Wister Dam and Reservoir.

Reservoir

The initial conservation pool with a top elevation of 471.6 will have a surface area of 4,000 ac. and a capacity of 30,000 ac. ft. On top of this the flood-control storage pool to be used temporarily during flood periods will range between elevation 471.6 and 502.5 above mean sea level. The flood control reservoir capacity will be 400,000 ac. ft. Storage at elevation 527.5, top of dam, will be 1,250,000 ac. ft. The surface area of the flood-control pool will vary in proportion to the volume of water impounded from each particular storm but a repetition of

the floods of February-June, 1945, caused by six storm periods during which the largest volume of water passed the site, would form a lake of 23,000 ac. The reservoir will have a drainage area of 995 sq. mi. The impounded lake will extend about 18 mi. up the valley of the Fourche Maline River in a westerly direction from the dam site. Another arm will extend about 16 mi. in a southeasterly direction up the valley of the Poteau. The maximum width of reservoir will be about three and a half miles.

Normal stream flow will be permitted to pass through conduits, without regulation, so that the conservation pool will remain at elevation 471.6 and during periods of low flow it will not be possible to utilize conservation storage in the reservoir to augment low flows downstream from the dam.

During flood periods it is contemplated that flood-control space in the reservoir will be temporarily used for storage of flood waters, the outflows from which will be governed by conditions downstream. Outflows will also be limited to bankfull stages or less on the Poteau River except that no outflows will be permitted when the Arkansas River is in flood stage. Consistent with these conditions the flood control pool will be emptied as soon as possible following storm periods.

The water supply feature included in the reservoir is an 8-in. pipe provided for in the dam for possible future use as a water supply outlet. In the event that local interests have use for the water arrangements to obtain it can be made through the Oklahoma Planning and Resources Board and the Corps of Engineers.

Dams and dikes

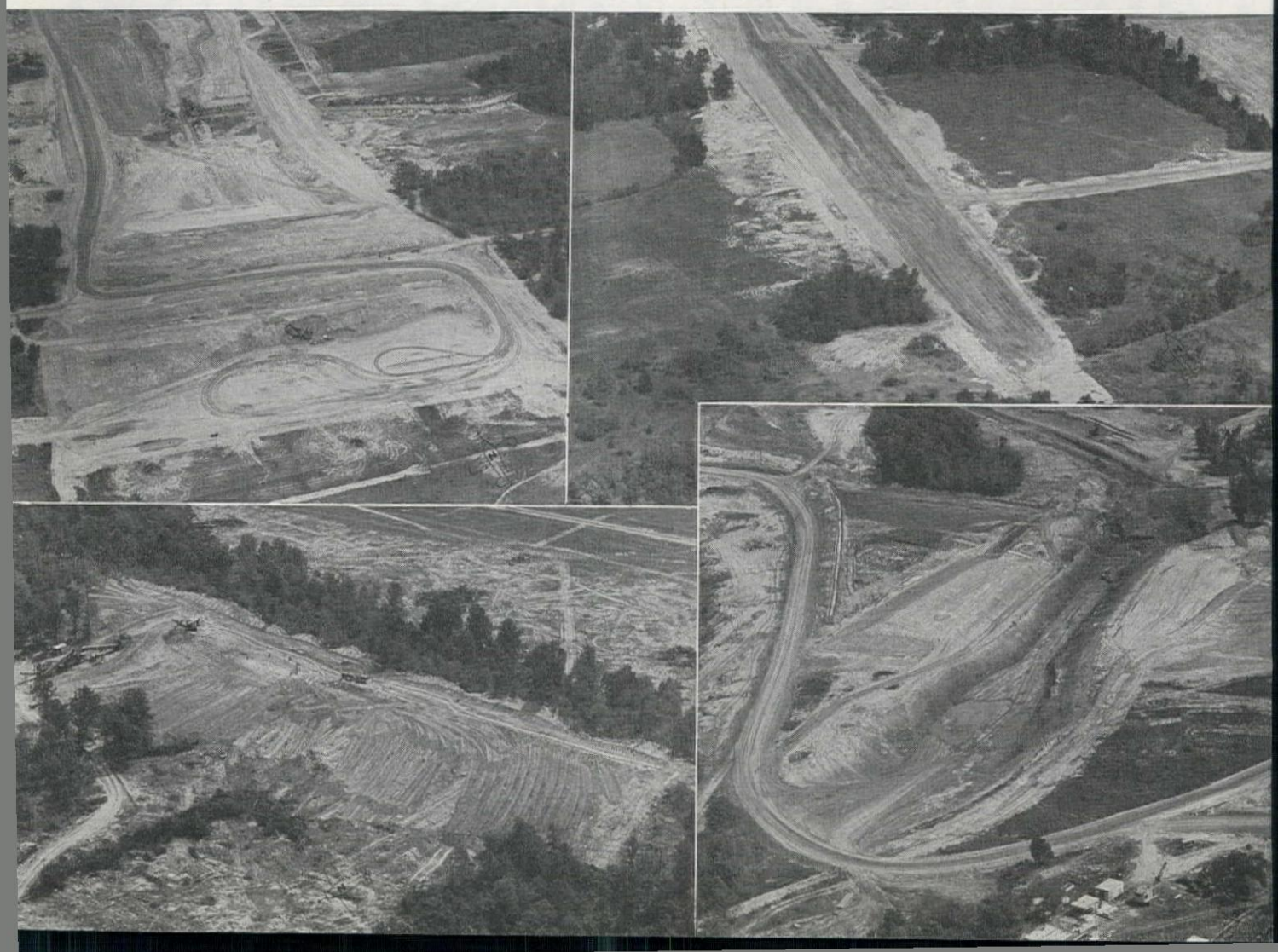
The dam will be an earthfill structure with rock protected slopes. The approximate crest length will be 5,700 ft., the maximum height above stream bed 95 ft., and the top width 25 ft. A dike having a maximum height of 40 ft., and an approximate crest length of 2,400 ft., will extend from the right abutment and will be constructed similar to the main embankment. A road will be provided across the top of the dam. The structures will contain 2,225,000 cu. yd. of earth embankment and 200,000 cu. yd. of stone riprap and gravel to protect the face of the dam.

Spillway and control works

An uncontrolled concrete spillway will be constructed through a ridge downstream from the right abutment. It will have a crest elevation of 502.5, be 600 ft. in length, and have a capacity of 273,000 cu. ft. per sec., which will be sufficient to pass a flow larger than that of the June 1935 flood without endangering the dam. Six tractor-type vertical lift sluice gates 7 ft. wide by 12 ft. high will provide additional regulation of outflows from the reservoir by sluice under the embankment. The conduit will have twin "D" shaped passages, each with 16-ft. inside width and 12-ft., 10-in. inside height. A 30-in. diameter pipe at elevation 452.25 will by-pass the sluice gates and carry low flows from the pool.

Wister project was designed by the U. S. Engineer Office, Tulsa, Okla., and is being constructed under its direction. Plans and specifications were prepared by Cochrane and Hendrix, consulting engineers, Tulsa.

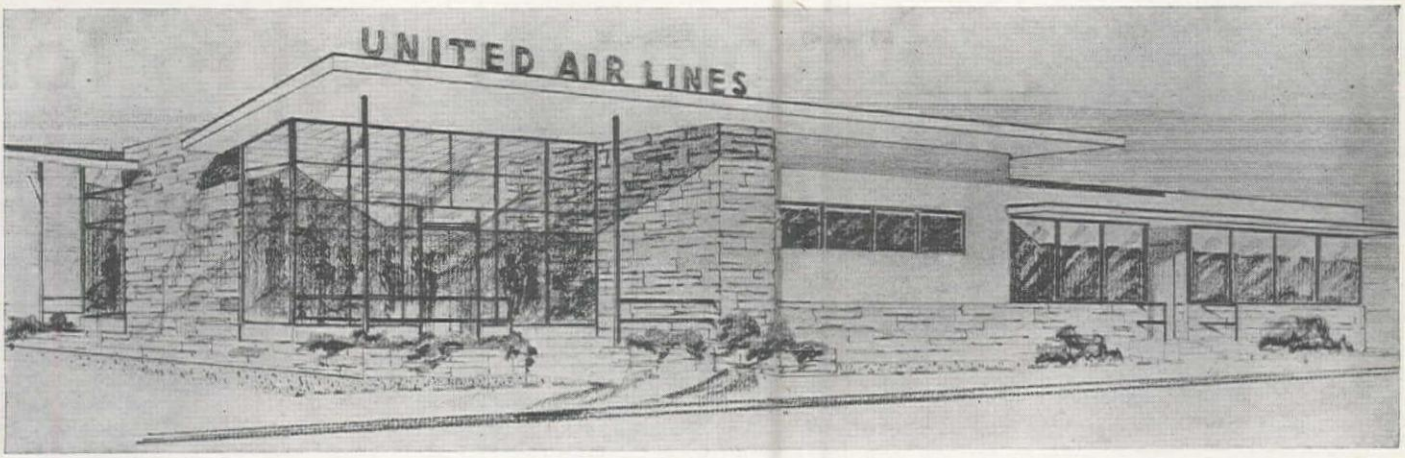
The initial contract on the dam was awarded by competitive bidding to Groves, Lundin and Cox, Inc., of St. Paul, Minn., for $4,016,727, on March 11, 1946. Work under this contract began April 10, 1946. The cost of the dam and appurtenant structures, land and relocations, under the latest revised estimate in view of generally increased costs will aggregate $8,090,000. The contractor is scheduled to complete the construction work on or before June 16, 1948. Work is proceeding on schedule and upon completion, employment on the average will have been about 170 persons.



LOOKING NORTH, downstream from the spillway excavation, 24 per cent of which is complete (upper left). Flat area in immediate foreground is at grade. General view of main dike (upper right). Placement of fill in the dike is 36 per cent complete. Air view of rock quarry (lower left) from which riprap, spalls, and gravel blanket under the riprap and spalls, will be obtained. Excavation of outlet works looking downstream (lower right). Deep cut in upper center is the stilling basin.

Photos by D. L. Curtis, Aerial Photo Service, Tulsa, Okla.

Valley Stations Opened by United



ARCHITECT'S DRAWING of Modesto-Merced airport passenger stations, opened Feb. 22. The latest in terminal design, the buildings feature large glass areas, sheltered by a broad soffit.

FRANKLIN, KUMP and Falk of San Francisco get credit for architectural design and structural engineering on United Air Lines' two newest airport passenger stations, with the opening of the new operations buildings at Modesto and Merced, Calif., on Saturday, Feb. 22. The structures were erected by L. H. Hansen & Sons, building contractor with headquarters at Fresno, Calif.

An application of the latest features in terminal design to the typical California solar house, the new buildings feature large glass areas sheltered by a broad soffit.

The exterior design and the soffit coloring have been carried into the interior of the waiting room through the large plate glass panels which form the lobby's front wall. The slope of the soffit is also carried inside, as are the plant boxes on both buildings.

Roof of the buildings are of conventional construction with felt paper, covered with tar and gravel. Concealed drain pipes lead from the roof through the inside of the building.

Asphalt tile flooring is used throughout the buildings, and a radiant heating system is embedded underneath. Both structures are air conditioned against the San Joaquin Valley's summer heat.

Board and batten siding of the Modesto station is combined with a Roman brick wall laid in the checkerboard pattern, in which bricks are not offset but laid one on top of the other. A mixture of Yosemite and Utah stone is used for exterior walls of the Merced station.

Interior decoration of the lobbies uses Oregon pine veneering. Ticket counters and baggage facilities open off the lobby into the other offices of the building, which include a flight operations office, communications room, and a utility room. Office space is also provided for CAA officials, the Weather Bureau, and —in the case of Modesto—an office for the city airport manager.

A new taxi-way, more than a quarter mile long, was constructed to provide access to the Modesto station.

The new buildings, according to L. N. LaPointe, United Air Lines' Western manager of Design, Building and Airport section, are a product of the idea put forward by W. A. Patterson, president of United, who believes that his company should aid in the development of the cities which it serves, by having a capital investment in such cities' future, and by designing facilities to blend acceptably with other improvements in the community.

Bids Again Advertised For Oregon Flood Dam

PLANS FOR THE CONSTRUCTION of Dorena dam, third unit of the Willamette Valley flood control project in Oregon, have been made available to contractors by the Portland District, U. S. Engineer Department, and bids will be opened in Portland on March 20, according to present plans of the district. This is the second time that plans have been issued by the district; they were withdrawn prior to the scheduled bid opening last August following the order cutting expenditure of Federal construction funds.

Dorena dam will be constructed on the Row River 6 mi. southeast of Cottage Grove at a total estimated cost of $9,000,000. Some preconstruction work has already been completed at the dam site. Construction under the major contract which will be awarded next month is estimated to cost $5,740,000. The dam will have a crest 4,650 ft. long, and will be of the earthfill type.

Major construction quantities include: 473,000 cu. yd. of common and rock excavation; 2,932,500 cu. yd. of embankment; 15 million gal. of sprinkling; 160,575 cu. yd. of concrete; 687½ tons of reinforcing steel; 4,000,000 cu. yd. of borrow excavation; and 214,000 cu. yd. of stripping. Time to be permitted for completion of the project will be 1,200 calendar days.

Forest Service Names New California Forest

SIX RIVERS National Forest will be the name of the Federal unit recently established in the northern Coast Range of California, according to announcement by Perry A. Thompson, California regional forester, U. S. Forest Service. The new forest was formed by the consolidation of 900,000 ac. previously included in three long-established national forests.

The name was selected in Washington by Lyle Watts, Chief Forester, because the watersheds of six important North Coast rivers are located in the timbered areas embraced by the forest: Smith, Klamath, Trinity, Mad, Van Duzen, and Eel Rivers. Regional Forester Thompson pointed out that such a name is especially appropriate for a national forest because watershed protection and flood control are primary purposes in the management of such forest lands.

The Six Rivers National Forest, with headquarters at Eureka, is in charge of Supervisor William F. Fischer. It is the 18th national forest in California and the 159th national forest in the United States.

Vancouver Undertakes Large Sewer Construction Projects

TWO SEWER CONSTRUCTION projects estimated to cost $2,000,000 will be undertaken this year in Vancouver, Wash. A sanitary interceptor sewer is expected to be placed under construction within the next few months. It will be financed by a $600,000 bond issue approved at last November's election, a state grant of $288,213 and surplus city funds amounting to about $300,000. The second project is a storm drain in west Vancouver which is expected to be placed under construction by June 30. Estimated to cost at least $1,000,000, it will be financed by means of a local improvement district. Plans for both projects are being prepared under the direction of Marvin E. Ray, city engineer for Vancouver.

Tunnel, New Highway Recommended to Toll

RECOMMENDING the immediate construction of a 2.03-mi. tunnel at Snoqualmie Pass, and an overall mountain highway improvement program estimated to cost $48,485,000, Ole Singstad has reported the results of his last year's survey of the Cascade Mountains highway problem to the Washington State Toll Bridge Authority. Any possibility of a low-level, long tunnel through the Cascades has been dismissed by the engineer with the comment that such a project would not only be unfeasible economically, but is unnecessary. Likewise, the possibilities of combining all transcontinental railroads, utility services, and vehicular routes in a single tunnel have been dismissed as impractical.

For many years various sources in the state of Washington have been suggesting that a low-level vehicular tunnel should be driven through the Cascade Mountains to connect the more populous western slope with the larger eastern portion of the state. The 1945 legislature authorized a comprehensive engineering survey of the entire problem of trans-mountain transportation to be undertaken by the Washington State Toll Bridge Authority.

Ole Singstad, consulting engineer of New York and a leading authority on sub-aqueous tunnels, was retained to make the survey. The accompanying article is an abstract of his report, somewhat rearranged for more convenient reading. —Editor.

IN THE MAIN RANGE of the Cascade Mountains the depth of snow in general increases with the altitude, and so do the factors creating snow slides. As the summits are approached the slopes become steeper. If there is any one contour which is more significant than any other, and at which a tunnel should be located to eliminate snow trouble and interruptions to traffic, it is at or near the 2,500-ft. level. Subject to some variations due to local conditions of topography, grades, and curves, this in general is the approximate elevation at which it becomes desirable to get under cover.

There are very few places in the main range of the Cascades where it is possible to locate a vehicular tunnel at this elevation without the tunnel being so long that it becomes economically unfeasible. It is a fortunate circumstance, however, that the lowest part of the Cascade range is almost in a direct easterly direction from the two principal cities on Puget Sound, Seattle and Tacoma. There are only two places where it is economically feasible at present, or at any foreseeable future time, to provide by means of a tunnel an east-west, all-winter, commercial highway route free from the hazards of winter interruptions. These two places are near Snoqualmie and Stampede Passes.

Snoqualmie versus Stampede

At Stampede there is no well-defined pass through which to carry a surface highway across the top of the mountain such as exists at Snoqualmie. The Green River-Stampede route, however, is in one important respect a good location for a Cascade tunnel crossing. The highway on this route would be located in the heavy snow region for a shorter distance than would be possible on any other route, and it would have as low gradient approaches as any other route.

There are important practical considerations in selecting the first vehicular tunnel crossing of the Cascades. The Snoqualmie route permits the building of the shortest (2.03 mi.) and cheapest tunnel, while the Stampede tunnel would be 2.54 mi. long. It has an existing primary highway, U. S. 10, which can be used as east and west approaches, and which is the only east-west highway in the state to be designated as a regional highway by federal authorities.

It is a direct route to and from the greatest single population center, Seattle, and can be conveniently connected to the second largest population center, Tacoma. The west portal of the tunnel would be located at El. 2330 which is 335 ft. lower than would be practical at Stampede, and the summit is 55 ft. lower than on the Stampede route. Finally, it would come nearer being a self-liquidating toll project.

In comparing the Stampede and Snoqualmie crossings of the Cascades with reference to truck traffic there is very little difference in the prevailing grades and total lift. The only advantages in favor of the Stampede route are the 2.8-mi. shorter distance between common points, and 8.5-mi. shorter distance from Easton to the east portal where rotary snow plows have to be used during the winter.

Snow removal savings

The winter season of 1945-46 is generally reputed to have been a heavy snow season, although the recorded snowfall at Snoqualmie Pass is within a half inch of the average annual snowfall of 411.6 in. recorded by the state highway department over a period of 37 yr. During this season the cost of snow removal was as follows:

Upper crossing Snoqualmie River to Hyak . .	$ 65,907
Hyak to Easton	20,000
Upper Crossing Snoqualmie River to North Bend	15,000
Total	$100,907

The largest of these items could be practically eliminated if the road over the summit were closed during the winter months. This would affect only two types of travel; namely, the skiers who could conveniently and with greater safety reach the summit by using the tunnel and a short distance of highway from the east portal to the summit which could be kept open for this purpose at small cost.

The second type is the oil and gasoline trucks, amounting to 25 vehicles per day. Oil and gasoline in bulk cannot be permitted through the tunnel because of fire hazard. There are other available means of transporting these products across the mountains in the event that the summit is closed to traffic. Preliminary investigations indicate that oil and gasoline could be transported by pipeline from tidewater at Puget Sound to a central distributing point such as Cle Elum at about a third of present costs.

Snoqualmie tunnel route

Difficult winter snow conditions on the Snoqualmie Pass highway begin at the upper bridge across the south fork of the Snoqualmie River, 4.9 mi. west of the summit, and extend in an aggravated degree to Hyak, 2.4 mi. east of the summit. On the western slope the grades are very steep and for a considerable distance the road runs along the steep mountainside on the south side of the river where it is subject to severe snow slides. East of the summit the grades are excessive for a considerable part of the distance between the summit and Hyak. From Hyak to the east end of Lake Keechelus there are many sharp curves, and at two places there are short stretches of steep grades combined with objectionable curvature.

Several miles to the east between Lake Keechelus and Easton there is another long stretch of steep grades where the route climbs up from Easton to the mountainside to the west and then down again to the level of the lake, so that there is considerable difficulty in keeping traffic moving during the winter season all the way from the upper bridge of the Snoqualmie River to Easton, a distance of about 24.5 mi.

Snoqualmie Pass summit, because of the horseshoe shape of the high mountains surrounding the pass on the north and northeast, has a localized area of very heavy snowfall for that altitude. It does not extend as far east as Hyak where the east portal of the proposed tunnel will be located. At this point the snow depth is as much as 4 to 6 ft. less than at the summit. Rotary snow plows are usually not required more than about 6 mi. west of the summit and 19 mi. east of the summit, although during heavy falls they may be used over a total distance of 43.5 mi.

for Snoqualmie Pass Bridge Authority

Approach locations

During the winter there is often a heavy fog at Snoqualmie Pass, but this seldom extends more than a mile along the highway in either direction from the summit, and very rarely as far as the proposed tunnel portals. The tunnel route will replace 9 mi. of the present highway extending from a point 6 mi. west of the summit to a point along Lake Keechelus about 3 mi. east of the summit, thus eliminating that part of the road where the serious difficulties occur.

It will shorten the route by 2.5 mi., bypass the area of heaviest snowfall, reduce grades to a maximum of 3 per cent, and reduce the curvature, but most important will remove the highway from the mountainside where snow slides occur to the opposite side of the river where there is no record or indication of slides and where the terrain is such that no snow slides may be expected.

The tunnel approach immediately west of the portal will cross the Snoqualmie River on a viaduct and at a point free from slides the tunnel enters the mountain at El. 2330 which is 675 ft. below the highway elevation at the summit. The tunnel emerges on the east at El. 2635 a short distance above Hyak from which point a new highway is carried on easy grades and alignment to a junction with the present highway on the east shore of Lake Keechelus 1.4 mi. east of the portal. Skidding on steep grades, now one of the principal difficulties, would be entirely eliminated on 3 per cent grades and would not occur to any appreciable extent on grades up to 3½ per cent.

Tunnel design

The Snoqualmie tunnel is 10,676 ft. long, and on tangent alignment except for a length of 487 ft. at the west end where it is on a curve of 1,325-ft. radius. The roadway at the west portal is at El. 2329.5 and at the east portal El. 2635. Prevailing grade of the roadway is 3 per cent. The mountain summit is inside the east portal of the tunnel at El. 2636.

Reinforced concrete lining of the tunnel is not designed for full hydrostatic pressure, but is to be drained where necessary. The roadway, which is to be paved with brick, is 24 ft. wide between curbs and has a minimum headroom of 14.5 ft. A sidewalk 3 ft. wide and 3.5 ft. above the tunnel roadway is provided on the north side of the tunnel for maintenance personnel and emergency use. Split hollow tile is placed on the inside of the sidewalls to provide drainage for seepage water. Continuous gutters, drained at intervals, are installed at the bottom of the split tile.

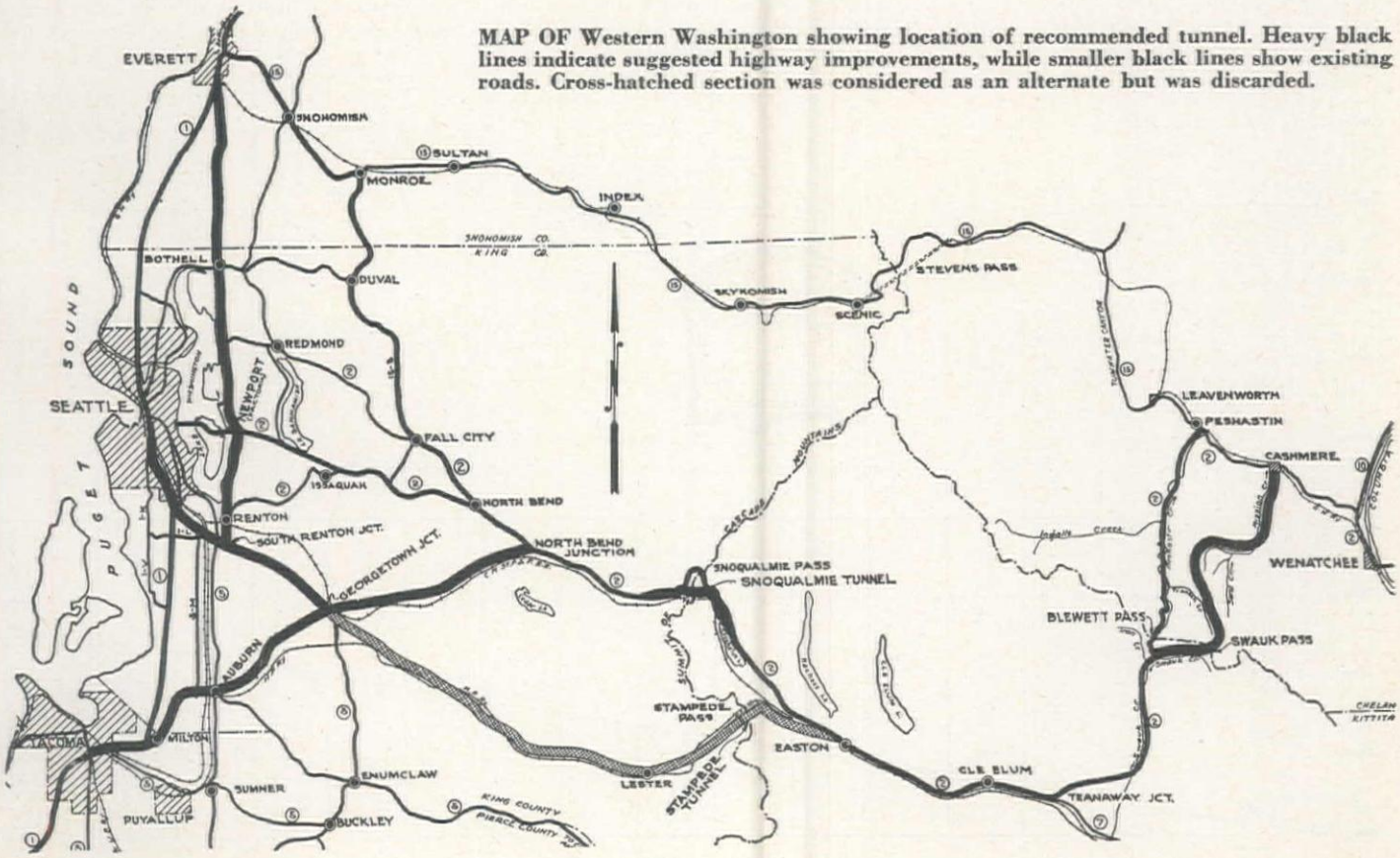
A cement-lined cast iron water pipe for service in the tunnel is installed in the sidewalk. Electrical conduits for power cables and for lighting, telephone, and signal wires are provided under the roadway slab, in the tunnel ceiling, and in the partitions between fresh and exhaust air ducts. The air ducts are above the roadway, separated from it by a ceiling. For reasons of economy the tunnel length is divided into four ventilating sections. The two westerly sections are about 2,830 ft. long, and the two easterly sections about 2,530 ft. long.

Ventilation system

The area of the air ducts is variable according to ventilation requirements, being greatest at the ventilation buildings and central shaft, and smallest at the bulkheads at the ends of the ventilation sections. This variation in air duct area is accomplished by varying the distance between the spring line of the roof arch and the top of the tunnel ceiling. It is carried out with a transition at each step about 20 ft. long.

The design of the ventilation system is based on maintaining a maximum concentration of not more than 2.5 parts of carbon monoxide in 10,000 parts of air in the tunnel roadway. Fresh air will be blown by means of fans through the fresh air ducts located above the roadway ceiling slab and forced through flues leading to openings above the curbs. Diluted air is drawn from the roadway through exhaust ports in the roadway ceiling into the exhaust air duct above and is forced out of the exhaust stacks into the atmosphere.

Three ventilation buildings will be provided to house the necessary ventilating equipment, one building at each



MAP OF Western Washington showing location of recommended tunnel. Heavy black lines indicate suggested highway improvements, while smaller black lines show existing roads. Cross-hatched section was considered as an alternate but was discarded.

of the portals and one near the center of the tunnel. The ventilation design is in accordance with the plan to provide at some future time a second tunnel paralleling the first. When this second tunnel is completed the first tunnel will be used for two lanes of traffic traveling in the same direction up the 3 per cent grade.

For two-directional operation of the first tunnel the ventilation buildings at each portal will house three fresh and three exhaust ventilating units. Each of these buildings will eventually house four fresh and four exhaust units. The centrally located ventilation building will house six fresh and six exhaust units. When the second tunnel is built this building will house eight fresh and eight exhaust units. This central ventilation building will be connected to the tunnel by a circular shaft 39.5 ft. in outside diameter and about 850 ft. deep. Concrete lined, it will be divided into seven longitudinal sections of which six will be air ducts and the seventh used for stair and elevator space. With reference to the tunnel line the central shaft will be located 5,658 ft. in from the west portal.

Electrical service

The nearest and most practical source of power is an existing 110-kv. transmission line passing about a half mile east of the east portal where it feeds a substation of the Chicago, Milwaukee, St. Paul and Pacific railroad. Since this transmission line is fed from both ends, it is proposed to insert an oil circuit breaker in the line to trip on line failures in either direction. A tap is to be taken on each side of the breaker and brought to two transformers adjacent to the east portal.

As a protection against total interruption of the tunnel lighting due to complete failure of the transmission line, it is proposed to maintain a storage battery in each portal building to feed a system of emergency incandescent lamps in the tunnel. In order to provide power for ventilation in case of failure of the transmission line it is proposed to install a 300-kva. diesel engine generator in the east portal ventilation building. The generator will be sufficient to operate half the tunnel lighting and two fans at 1/3 speed on each ventilation duct.

It is proposed to use the new slimline fluorescent lamp in a series system of distribution for the tunnel lighting. The lamps will be installed in two continuous rows, one on each side of the tunnel in coves at the junction of ceiling and wall. Each row will be fed in sections of 75 ft. from two alternate circuits. It will be possible to vary the light intensity over a range of 4 to 1. To ease the transition from bright sunlight to normal tunnel lighting, the light intensity is considerably higher at each portal and gradually decreased to normal intensity over a distance of 1,800 ft.

Construction and operation

Subsurface explorations have not been made beyond the taking of one core boring to tunnel subgrade about 250 ft. west of the east portal. The tunnel will be in rock for its entire length, and it is reasonable to assume that the rock conditions will be similar to those encountered in the building of the nearby Chicago, Milwaukee, St. Paul & Pacific railroad tunnel. Its construction will present no unusual difficulties, and it is estimated that it will take three years.

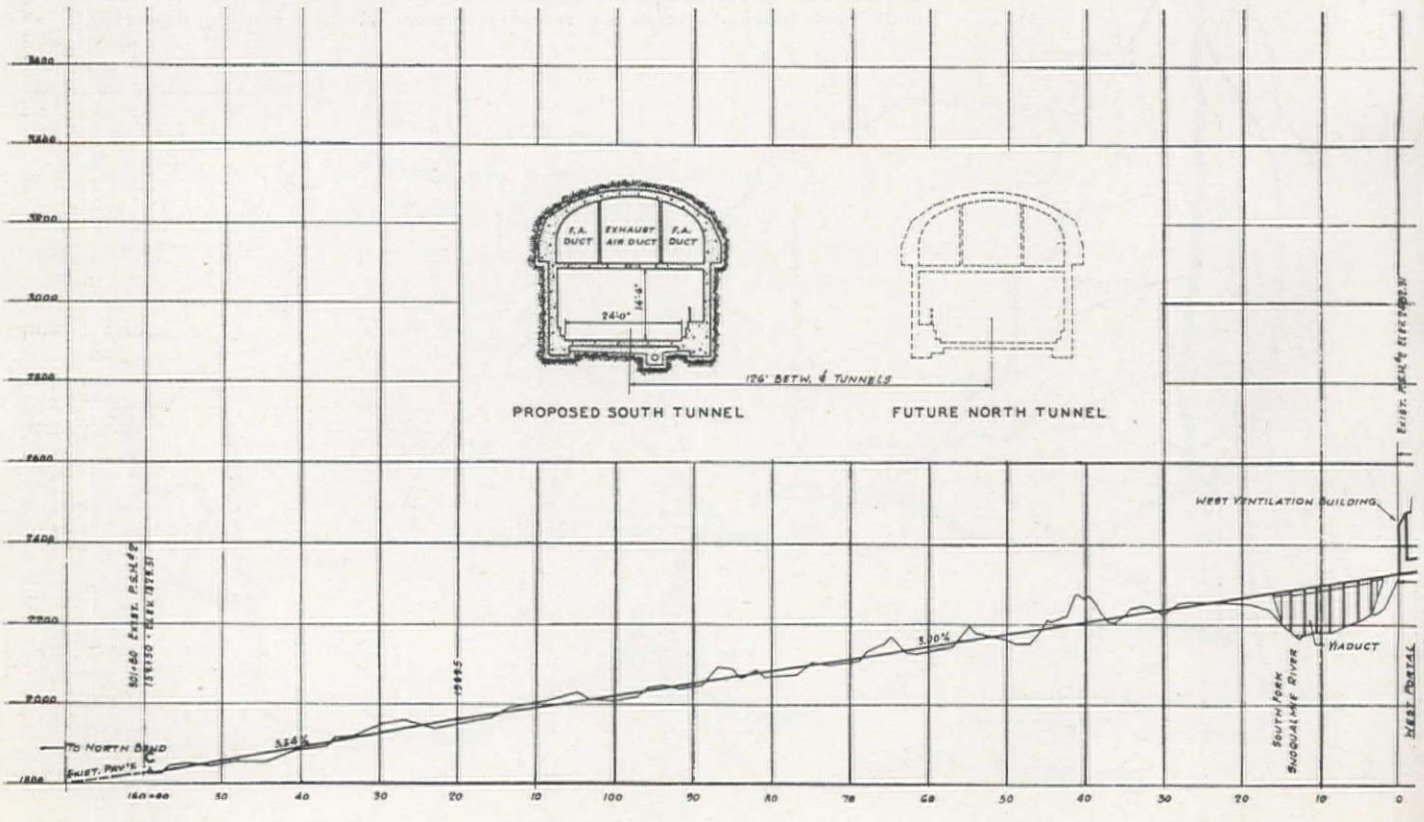
The cost of constructing and equipping the Snoqualmie tunnel ready for operation is estimated to be $21,940,000. The estimated cost of constructing and equipping the Stampede tunnel is $26,420,000. These estimates are based on present day prices. The breakdown of construction costs for the Snoqualmie tunnel is as follows:

Rock tunnel		$12,330,000
Center shaft		1,820,000
East plaza		280,000
Ventilation buildings		1,600,000
Fans, motors and transmissions		440,000
Electrical installation		1,930,000
Tunnel finish		450,000
Tunnel paving		130,000
Operating equipment		90,000
Access roadway to shaft		40,000
		19,110,000
Engineering and administration		1,900,000
		21,010,000
Interest during construction		930,000
Total		$21,940,000

Cost of operation of the Snoqualmie tunnel is estimated at $128,050 for the first year, increasing to $145,170 the fifth year of operation, and to $195,260 when the traffic has reached four million vehicles annually. It is estimated that the cost of operation of the Stampede tunnel would be the same as for the Snoqualmie tunnel. The initial annual operating cost is broken down as follows:

Payrolls	$ 89,420
Supplies and misc.	10,000
Power	17,630
Insurance	11,000
Total	$128,500

Although the Stampede tunnel is a half mile longer, the fact that it is on a nearly level grade and has four ventilation buildings instead of three, reduces the cost of power per foot of tunnel for proper ventilation, while the operating personnel required is about the same.



Income from tolls

The planning survey division of the Washington department of highways conducted an origin and destination survey on all Cascade Mountain passes during 1946. The traffic survey shows that the annual average daily volume of Snoqualmie pass is 2,385 vehicles for the year 1946. This volume may be expected to increase in direct proportion to the population increase for the state of Washington which has been estimated to reach a new high of 2 per cent annually. Compounded annually, this gives an anticipated traffic volume on Snoqualmie Pass of 2,631 vehicles for the year 1951.

Proposed toll rates used in estimating tunnel income are the same as those in effect on the Tacoma Narrows ferry. Automobile rates would be 50 cents including driver with an additional charge of 10 cents per passenger. Truck rates would vary from 55 cents for a gross license weight of 2½ tons or less to $3.00 for a gross weight of 15 to 17 tons.

Income on the basis of above traffic and toll figures is estimated at $977,000 for the first year after completion of construction, rising to $1,714,000 during the twentieth year after beginning of construction. Based upon this estimate of traffic and on the estimated cost of construction and operation of the tunnel, it is indicated that a bond issue of $17,000,000 could be readily financed on a 30-yr. amortization.

Mountain highway program

With only two places existing where it is economically feasible to cross the Cascades with an all-winter, all-traffic highway, present and prospective traffic could be handled without difficulty through one two-lane tunnel at Snoqualmie Pass. Because of the high cost of the tunnel, the construction of a companion tube should be deferred until the first is on a sound financial basis, and the volume of traffic indicates the necessity for relief.

Upon the completion of the second tube at Snoqualmie, this highway could handle a volume of mixed traffic in excess of twelve million vehicles per year. Looking into the future when additional highway capacity across the Cascades will be necessary, the next step would be the building of a highway along the Green River Valley with a single two-lane tunnel at Stampede and eventually a second two-lane tunnel. The highway from the esat portal of that tunnel would follow the Yakima River Valley to Easton and Cle Elum, paralleling the Snoqualmie route.

Essential parts of the first step, that is the building of the first two-lane tube at Snoqualmie are the following:

1. A new highway across the Wenatchee Mountains from a point on the present highway at the confluence of Swauk and Iron Creeks on the south foothills of the Wenatchee Mountains, over Swauk Pass to a junction with the primary state highway at Cashmere.

2. A new express highway from U. S. 99 in the vicinity of Milton to a connection with U. S. 10, 6 mi. east of North Bend.

3. Make U. S. 10 four lanes on the mountain crossing between 6 mi. east of North Bend and Easton, with such rectification of the line and grades as is necessary to make it a safe, high-speed, and economical all-winter route.

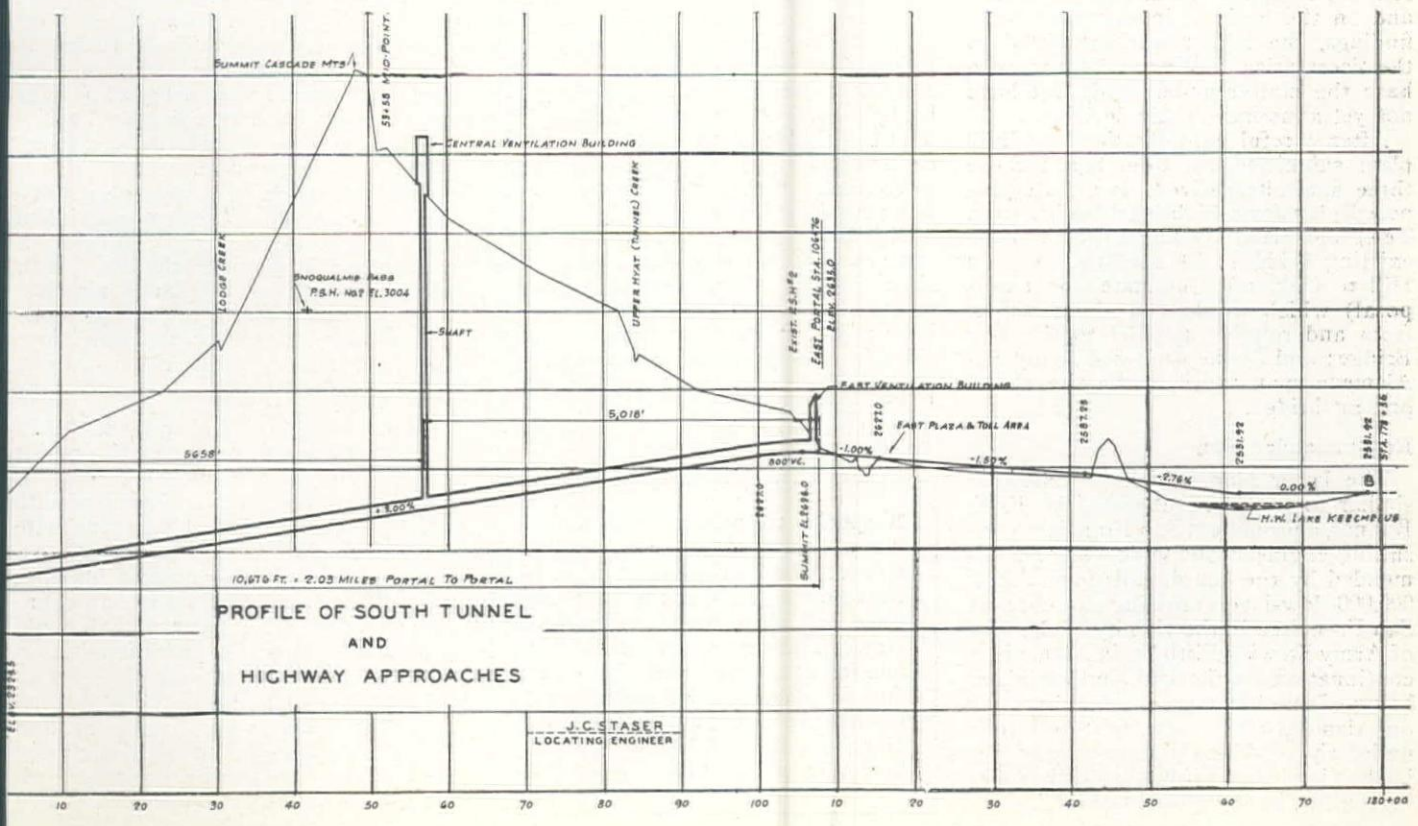
4. A low gradient highway suitable for truck traffic from Georgetown Junction to South Seattle.

5. A low gradient highway suitable for truck traffic from Georgetown Junction east of Renton to an intersection with U. S. 10 east of Lake Washington at Newport.

6. An improved highway from U. S. 10 at Newport to Everett by way of the vicinity of Kirkland and Bothell.

The estimated cost of this complete program is set at $48,485,000 for the Snoqualmie route, or at $49,300,000 for the Stampede route. It is broken down as follows:

Common Connections—Both Tunnel Routes	
Swauk Pass—Iron Creek to Cashmere	$ 2,200,000
Tacoma to Georgetown Junction	2,100,000
Georgetown Junction to South Renton Junction	1,360,000
South Renton Junction to South Seattle	2,625,000
South Renton Junction to Newport Junction	2,210,000
Newport Junction to Everett	4,125,000
Snoqualmie Tunnel Route	
North Bend Junction to Snoqualmie Tunnel Approach	2,200,000
West Tunnel Approach Road and Viaduct	1,465,000
Snoqualmie Tunnel	21,940,000
East Portal of Snoqualmie Tunnel to Easton	4,100,000
Georgetown Junction to North Bend Junction	4,160,000
Stampede Tunnel Route	
Georgetown Junction to West Portal of Stampede Tunnel	6,300,000
Stampede Tunnel	26,420,000
East Portal of Stampede Tunnel to Easton	1,960,000



San Francisco Bay—
Army-Navy Report on Second Crossing

THE INADEQUATE cross-bay vehicular traffic facilities in the San Francisco Bay area are once again in the limelight, with controversy raging over a joint Army-Navy board's recommendation to the Secretaries of War and Navy that a six-lane combination causeway-tube be constructed immediately across the bay at a point several miles south of the present bridge. Consideration was also asked by the board for a long-range integrated rapid-transit plan for the entire Bay area. All interested parties at the board's hearings some months ago seemed to concur that an additional crossing was needed, but there was considerable dissension as to location and type to be constructed.

Meanwhile, a few days after the board released its report to the public, the California Department of Public Works, through its chairman, Chas. H. Purcell, builder of the existing bay bridge, issued a report urging another structure to be built parallel with the present one and about 300 ft. northerly of it.

Under a House Resolution passed by the last Congress, a six-man board composed of officers of both armed forces was drafted to investigate the situation and to study the feasibility of an additional crossing for the bay. Army personnel on the board consisted of Brig. Gen. Garrison H. Davidson and Colonels Edwin H. Marks and George Mayo, and as its Navy members, Commodore Lewis N. Moeller and Captains F. C. Fluegel and James E. Baker. After a series of ten meetings, public hearings were held, and on the basis of investigations and findings, the report was submitted to the Secretaries of War and Navy, who have the matter under study but have not yet announced their decisions.

After careful consideration of all 29 plans submitted, the joint board chose three final alternatives: 1) a state-proposed plan for a high-level bridge from Telegraph Hill to Oakland (north of the existing bridge); 2) one from Rincon Hill to Oakland, (the state's final proposal) which would run about 300 ft. from and roughly parallel to the Bay Bridge; and 3) the proposed Army St.-Alameda span south of the site of the present bridge.

Recommended plan

The latter plan, which is somewhat similar to the plan submitted by F. E. Bonner, a prominent San Francisco consulting engineer, and which was recommended by the board, calls for a $261,000,000 low-level crossing to connect San Francisco in the vicinity of the foot of Army St. with Fifth St. in Alameda, a continuation to the Oakland mainland being effected by a cross-island freeway on Alameda and a new, four-lane tube under the Oakland Estuary, emerging in the vicinity of Fifth, Clay and Washington Sts. in downtown Oakland.

Western end of the crossing would be a trestle, fifteen feet above mean lower low water and about 3,600 ft. long. At the eastern end of the trestle-type structure, the crossing would lead into an underwater tube which would extend for 6,400 ft., the central 1,500 ft. of which would allow a 50-ft. navigational clearance, the roadway at that point being 81 ft. below mean lower low water. At the end of the 6,400 ft. tube the crossing would again become a trestle for 15,000 ft. The easternmost 7,000 ft. would be earth and rock fill, and would lead onto the island of Alameda at Fifth Street.

Access roads at both ends of the crossing are proposed by this plan. From the western end of the crossing near Third and Army Sts., these roads would lead into Third and Tennessee Sts. and into the downtown business district, and along Twenty-sixth St. to the Bayshore Highway. In Alameda there would be turnoffs to the southern and northern sides of the island, giving access to the city of Alameda and southeastern areas of the Eastbay region through connections to existing spans across the Oakland estuary. It is estimated that the reduction in flow of traffic outward through Alameda would allow the construction of a four-lane tube to carry the remainder of traffic into Oakland.

The board's decision was reached after consideration of 29 plans in all which were submitted to them. A series of ten meetings were held before the public hearing began, during which time the board reviewed previous reports including that of the commission appointed in 1929 (Hoover-Young San Francisco Bay Bridge Commission) which was instrumental in deciding on the present bay bridge. During the ten meetings, the board decided: a) to investigate all locations and types of crossing necessary to recommend that which it considered best; b) limit investigation to need for additional crossing facilities and advantages of added facilities (industrial sites, airport sites, shipping berths) created by the Reber plan which would have a direct effect on traffic; c) consider feasibility of such a crossing.

Reber Plan discussion

In the discussion of the Reber plan, the article which appeared on pages 103-105 in the March 1942 issue of *Western Construction News* was used as the reference, the board concluding that it was the best available information on the plan. This proposal called for construction of earth and rock fill dikes which would transform the south arm of San Francisco Bay and the smaller bays north of San Quentin Point into fresh water lakes and which would provide much new land area along the eastern side of the bay. Highways would be carried on the causeways, and direct land connections of all rail transportation systems between Marin County, the East Bay and San Francisco would be provided for by the additional land areas.

Considerable opposition from county, state, commercial and agricultural interests was apparent in discussion of the Reber plan, in most cases from persons with special interests to protect—or incomplete knowledge of the plan. Ed Hyatt, Chief of the Division of Water Resources for the State of California indicated that so far as his department was concerned, a salt-water barrier, for many years one of the principal features of its program, was no longer necessary. He also stressed the costs of levee maintenance and drainage. Dr. Wilton L. Halverson, state director of Public Health, pointed out that disposal of sewage and industrial wastes into tidal estuaries was more satisfactory than fresh water lakes. He also described the nuisance conditions that might prevail around such lakes, and spoke of the need for more intricate and complex sewage plants if waste disposition was made in fresh water lakes. His argument was made ineffective however by the passage of bonds by Eastbay cities at the November election, to construct treatment plants for their sewage.

At public hearings, other state, county, and industrial officials expressed violent opposition to the Reber plan. From private and public hearings, the board drew the conclusion that this plan would have a detrimental effect on local economy and industry. Some of the objections listed were:

1. Transportation

According to the Reber plan, the 2,000-ft. wide south mole would provide a freeway of 6 to 8 four-lane roads, if required, connecting San Francisco with Alameda County as well as adequate space for main-line trains. In discussions, however, it was pointed out that none of the terminal areas in San Francisco offer a street pattern that could absorb more than four additional lanes of traffic in each direction.

The Reber plan also provided for the inclusion of main-line trains to San Francisco, a cause that has long been championed by San Franciscans, although the board felt it has been shown

A special editorial on the Army-Navy board plan for a "roller-coaster" bay crossing was published on page 126 of the February issue of Western Construction News. The report was issued too late for condensation in that issue, and is presented herewith. Next month, the report of the California Department of Public Works will be condensed in these pages.—Ed.

o be unsupported by public need. Hundreds of hours wasted daily in making he slow ferry crossing were not considered important. The board's study, however, brought out the question of uling grade. Preferred railroad grade is .5 per cent. Assuming a 1 per cent permissible grade with channel clearances ndicated in the plan as submitted, a unnel nearly 4 mi. long would be required in order to carry trains under the avigation channel, it was stated.

2. Water Conservation

The plan's premise was that the fresh vater lakes created by dams would serve s reservoirs. This was refuted by testimony at public hearings from the Bureau of Reclamation and the State Division of Water Resources, both of which stated that the state of California as already adopted a comprehensive vater plan which did not include the Reber proposal, and they did not wish o consider any changes. The San Francisco District U. S. Engineer reported hat a salt-water barrier was not economically feasible and that, if located nywhere below the Carquinez Strait, it would result in a waste of water rather han a saving.

3. Land Reclamation and Utilization

The Reber plan would provide 20,000 c. of new land by eliminating and converting shoal areas now present in the ay. No report had been made concerning the suitability of the material as fill, owever.

The proposed water level in the fresh vater lakes was set at 9.0 ft. above mean ower low water, which caused considrable alarm from Sacramento region actions, who claimed that maintenance f such water level would inundate subtantial portions of land in the Sacramento and San Joaquin river delta.

4. Industries

The salt industries located on the outhern shore of the bay total a $20,-00,000 investment at present. These vould no longer be located on salt water nder this plan, although pumping their imited requirements of salt water to hem would afford no great engineering ifficulty. The Reber plan would also damage operations of refineries in the Richmond area, and would cut in half the existing refinery of Standard Oil. Fishing industries might also be affected in some degree.

5. Economic Feasibility

From reports made at public hearings, the joint board estimated that direct costs of the Reber plan would be at least $415,000,000 including damage to contiguous property amounting to approximately $50,000,000. This would, of course, be partially balanced by the additional benefits not secured from the other plans.

6. National Interests

The system of locks which it will be necessary to set up under this plan would seriously impede navigation, it was claimed. The Reber plan contended that the freshwater lakes and channel would be a boon to shipping, since vessels would no longer have to spend so much time in dry dock. As the ships enter fresh water from the ocean, barnacles accumulated on the ships' sides drop off. This advantage, however, didn't appear to make up for the disadvantages claimed. Opponents of the plan claimed the construction of the dikes would eliminate 85 per cent of the tidal flow and might silt up the ocean entrance. It might also increase maintenance of interior waterways.

At the public hearings Alameda County was definite in its condemnation of the Reber plan. They stressed that it would hinder present or proposed port facilities, and that future harbor plans at San Leandro must be considered. The Alameda County Water District, however, presented a minority report favoring the Reber plan. They said it would prevent intrusion of salt water into their underground supply.

Contra Costa County offered no constructive plan for a bay crossing, but devoted its presentation at the public hearings to strong objection to the Reber plan. The report of its consulting engineer of the group stated that the indirect costs of the Reber plan might be as high as $331,000,000 to $575,000,000.

The general conclusion of the board with regard to the Reber plan was:

"Overwhelming opposition to the plan by state, county, and city authorities, together with commercial and military interests was presented at public hearings. After careful consideration of this and all other factors involved, the board has reached the conclusion that the Reber plan would result in the dislocation of industry, is economically infeasible and is untenable from the standpoint of navigation and national defense."

Other matters emphasized

In addition to opposition to the Reber plan, public hearings emphasized the need for an additional crossing from the viewpoint of peacetime economy. There was a strong demand by the county and city of San Francisco that the railroads be brought in, but this was opposed by the railroads themselves. The East Bay provided no opposition to trains coming into San Francisco, provided the need were shown to be justified.

Of the 29 plans submitted to the board at public hearings, ten were submitted by the State of California. Seven of these called for high level bridges on Yerba Buena Island. Another was for a tube in the vicinity of the present bridge. Ninth plan was for a high-level bridge from Potrero Point to Alameda, while the tenth was for a low-level bridge from Candlestick Point to Bay Farm Island.

Plans for high-level bridges were submitted by John W. Little, James J. Walsh, and Andrew Pagano. Little's plan called for a long-range program whereby three new spans across the bay would be built eventually.

Only plan for a full tube was submitted by T. A. Tomasini. This called for a tube six miles long with two railroad tracks and 4 to 8 lanes for traffic from 6th and Howard Sts. in San Francisco to the Oakland Mole.

Those submitting plans calling for solid causeways and ship locks were Sidney V. Dennison, whose plan was more or less a variation of Reber's, Fred

OVERALL view of the San Francisco Bay area, site of the proposed second bridge crossing. Army-Navy joint board report would place the new structure considerably to the right of present Bay Bridge.

ESTIMATED INITIAL COSTS
SOUTH CROSSING — CAUSEWAY TUBE
ARMY STREET, SAN FRANCISCO
TO 5TH STREET, ALAMEDA

1. Crossing proper	
a. West end causeway and fill	$ 4,600,000
b. East end open causeway	10,100,000
c. East end fill, dredging, paving and lighting	2,400,000
d. Dredging for island structures and tubes	1,300,000
e. Sand backfill for island structures and tubes	3,850,000
f. Cells for island structures-place	5,000,000
g. Tubes and appurtenances complete (according to estimate by Ole Singstad)	
1. Precast tunnel	34,200,000
2. Shafts, inch piles	4,080,000
3. Ventilation buildings	4,000,000
4. Fans, motors and transmissions	865,000
5. Electrical installation	3,400,000
6. Tunnel finish	725,000
7. Tunnel paving	180,000
8. Approaches, exclusive of dredging, backfill, etc.	1,125,000
9. Operating equipment	200,000
h. Administration building	500,000
Total (crossing proper)	$ 76,525,000
2. Approaches	
a. San Francisco	$ 5,400,000
b. East Bay	
1. Estuary crossing	22,200,000
2. Paving, ramps, etc.	2,093,000
Total (approaches)	$ 29,693,000
3. Engineering	5,310,000
4. Real Estate and Rights of Way	
a. San Francisco	10,000,000
b. Alameda	2,000,000
c. Oakland	4,200,000
d. Legal fees	405,000
Total (real estate and rights of way)	16,605,000
5. Miscellaneous	
a. Insurance	555,000
b. Interest	5,780,000
Total (miscellaneous)	6,335,000
Total Estimated Cost of the Project	$134,468,000

J. Drake, and Taggart-Aston. The Taggart-Aston plan called for a fresh water barrier with locks and floodgates carrying high-level highways with a low-level railroad.

Plans combining tubes with various low-level structures were submitted by Taggart-Aston, L. J. Nishkian, who proposed another modification of the southern portion of the Reber plan. He proposed that a 2,000-ft. solid causeway be built with channel tubes carrying 24 high lanes of traffic and 4 railroad tracks. F. E. Bonner, whose plan is somewhat similar to that recommended by the joint board, proposed a combination causeway tube between 16th St. in San Francisco and Main St., Alameda, with a solid fill 4,000 ft. in length from the San Francisco side, a navigation channel over a subaqueous tube of 3,000-ft. width and minimum depth of 48 ft. at mean lower low water, then a solid fill to the Alameda shore.

Tidal current charts of San Francisco Bay show a maximum normal tidal velocity of 2.2 knots per hour in this area. Due to the restriction to tidal flow offered by the solid mole, the author of the plan estimated that the current in the channel would be approximately 4.5 knots per hour.

In the plan as proposed, the joint board decided it would interfere with seaplane operation at the Alameda base.

Others who submitted plans for combination tubes with various low-level structures were Cleve F. Shaffer and Loring P. Rixford.

G. R. Bolander submitted the twenty-ninth plan. His proposal was for high speed monorail interurban facilities which would be supported on brackets from the present bridge.

Criteria

Criteria which had been set up by the board were:

1. That the second crossing should serve the present pattern of traffic reasonably well and provide for probable future traffic.

2. That it should discharge vehicular traffic into areas providing, now and in the future, easy, rapid, dispersion of traffic between the crossing and the central business district of San Francisco and the center of demand on the east side of the bay over existing or definitely planned arterials.

3. That it should provide minimum interference with national defense.

4. That it should provide minimum interference with navigation.

5. That it would permit amortization within a reasonable period of time without undue reduction in tax rolls.

With these criteria in mind, the board considered all possible crossings. A high-level bridge from Rincon or Telegraph Hill to the Key Mole did not interfere with national interests, it was decided. An Oakland Mole terminus for these bridges and Alameda as a terminus for a high-level bridge, springing from the Potrero Hill area, would not be acceptable because it would interfere with flight operations. Foundation conditions at the Oakland Mole were not suitable for the construction of piers for a heavy high-level bridge.

Conclusions

The board's conclusions as to adequate methods of solution of the problem were:

1. Reduce demand on the existing structure by replacing the use of automobiles with a system of adequate mass transportation.

2. Provide additional vehicular crossing facilities. At this point the board noted that a single interior lane on the existing bridge has a capacity of 1,450 vehicles or 2,460 passengers per hour, whereas a single track of subway has a capacity of 40,000 passengers per hour.

The board also concluded that an adequate system of mass transportation must:

1. Be free from delays incident to surface transportation.

2. Not be limited to low speeds required by design considerations of the crossing structures.

3. Have adequate terminal transfer and distribution facilities.

4. Lend itself to coordination with local rapid-transit systems. Elevated railways or subways are the only two methods of transportation which fulfill the requirements.

Therefore, the board concluded, that a rapid-transit system utilizing a centrally located tube and crossing the bay should be a component of a comprehensive long-range plan to solve the cross-bay transportation problem. With respect to this system, it would not be practical to bring them in over a north or central location since both of these involve a high-level bridge and therefore only a south location offers any possibility at all in this respect.

The final plan which the board recommended for adoption is somewhat similar to the Bonner plan in location and type. Advantages cited by the board were that it is an appropriate component of an overall general plan and that it would create less congestion in the downtown districts; it would make bay crossing facilities less vulnerable in time of war, and also coincides with the plan of the City of San Francisco; it provides relief for the City of Alameda, which complained during board hearings that the completion of the original Bay Bridge and resultant cancellation of ferry service made that community more isolated from San Francisco than it had been before the bridge was built; it is the only acceptable solution discounting the Reber plan, which provides

(Continued on page 142)

ESTIMATED INITIAL COSTS
CENTRAL CROSSING—PARALLEL BRIDGE

a. Crossing proper	
1. Borings and explorations	$ 170,000
2. Substructure—West Bay Crossing	13,680,000
3. Anchorages, San Francisco	1,940,000
4. Substructure—East Bay Crossing	8,020,000
5. Yerba Buena Crossing	4,250,000
6. Superstructure—West Bay Crossing	25,500,000
7. Superstructure—East Bay Crossing	16,200,000
8. Substructure Mole Girder Span	510,000
9. Final painting	1,550,000
10. Toll Plaza Alterations	178,000
11. Electrical Work	705,000
12. Traffic signs	8,500
13. Tunnel lining	163,000
14. San Francisco Section	1,400,000
15. Operating equipment	230,000
16. Island fences	8,500
17. Sprinkler system—Pier 20	102,000
18. Island Toll Plaza	25,500
19. Electrolysis protection	8,500
20. Administration Building Annex	112,000
21. Island Garage Annex	10,000
22. Oakland Maintenance Building	20,000
Total (crossing proper)	74,791,000
b. Oakland approaches	
1. Dredger fill	1,530,000
2. Rock wall	425,000
3. Cypress Street Separation	725,000
4. Extension Pabco Subway	34,000
5. Mole paving	510,000
6. 22nd St. Overhead structure	2,830,000
7. Alteration—existing distributing structures	1,218,000
8. Landscaping	85,000
9. Traffic signs	30,600
10. Traffic stripes	3,400
11. Water lines, curbs and widening	68,000
12. Relocating existing lights	136,000
Total (Oakland approaches)	7,595,000
c. San Francisco approaches	
1. Viaduct structure	3,000,000
2. Ramps	2,861,000
Total (San Francisco approaches)	5,861,000
d. Engineering	4,420,000
e. Real Estate and Rights of Way	
1. Oakland	2,350,000
2. San Francisco	16,850,000
3. Legal fees	480,000
Total	19,680,000
f. Miscellaneous	
1. Insurance	463,000
2. Interest	5,100,000
Total (miscellaneous)	5,563,000
Total estimated Cost of Project	$117,910,400

CONSTRUCTION DESIGN CHART

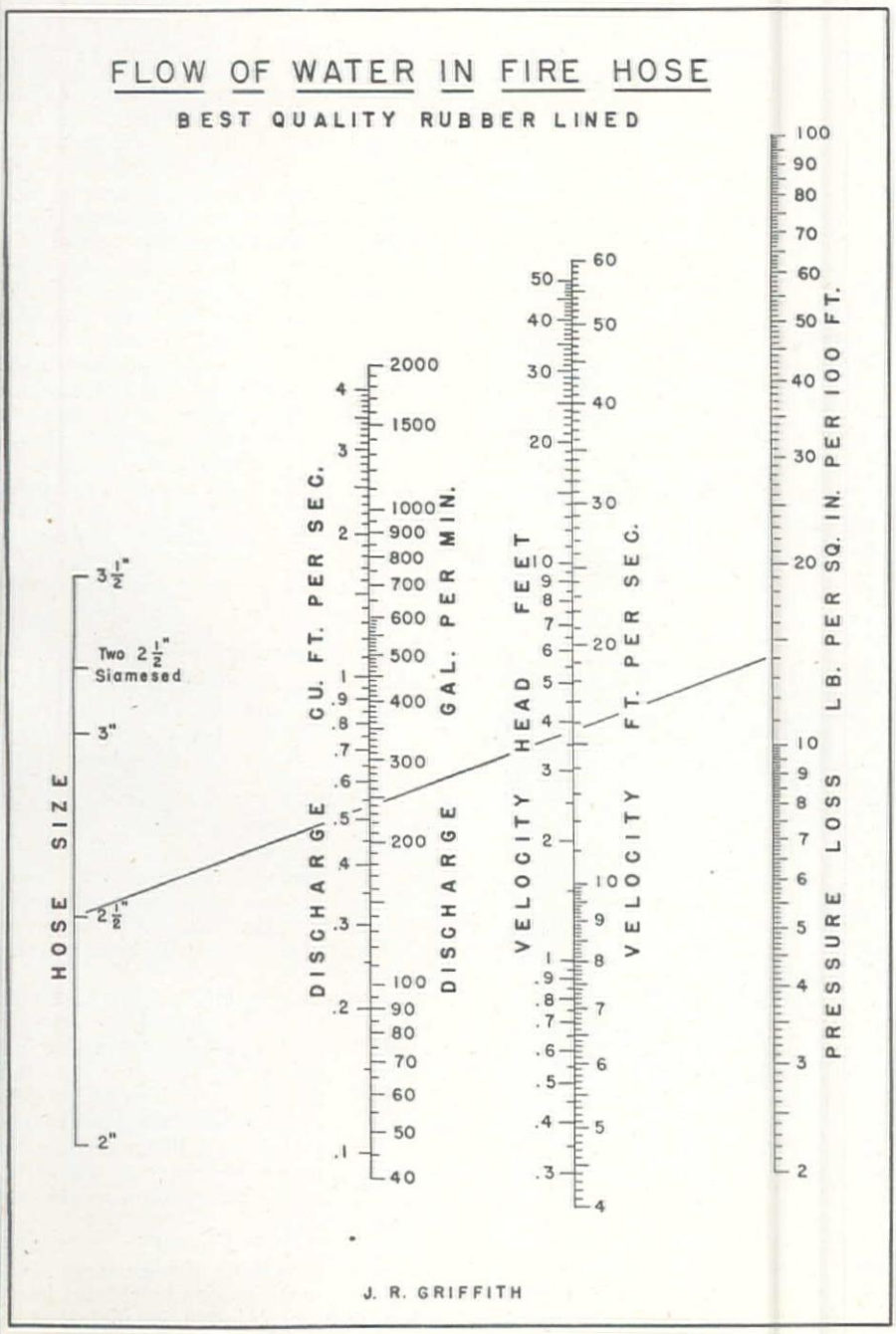
LXXXI . . . Flow of Water in Fire Hose

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

AMONG PREVIOUS charts published, we have given the readers many charts involving the flow of water in various types of containers. These previous ones will be found in the Reprint[1] of the series. The accompanying chart adds to this particular group giving the flow of water in best quality rubber lined fire hose.

While more recent tests have indicated better flow characteristics under some conditions, the tables originally prepared by John R. Freeman are still considered as standard by the National Board of Fire Underwriters. The accompanying chart has been prepared on the basis of the Freeman tables. The subject matter is of more than passing interest to me individually. In 1922 I prepared my first solution chart and it was on the subject of fire stream flow although not in nomographic form. There has been, so to speak, considerable water through the hose as well as over the dam since then.

Such a chart, as well as the original tables, gives only average results. Actually the flow of water in a fire hose is an exceedingly complex problem when it comes to an exact solution. The quality of the rubber lining may cause a large variation. Unlike the problem of steel or cast iron pipe flow, fire hose is more elastic with the sectional area of the stream tending to increase with the hydrostatic pressure, due to the expansion of the hose. Engineers are prone to think of some particular chart or table as giving an exact solution, when they have been using it for some time, overlooking the assumptions and averages the solution represents. Like many other engineering problems which defy an exact solution, reasonable approximations of the friction loss in hose must on occasion be made by water department and fire protection engineers. It is believed that in nomographic form, more information may be quickly obtained than in any other.



A single straight line intersecting all scales is necessary for a solution. I have drawn on the accompanying chart a solution line for a discharge of 240 g.p.m. through a 2½-in. fire hose. On the chart it will be seen that a pressure loss of 14.1 lb. per sq. in. per 100 ft. of hose, may be expected. John R. Freeman's Fire Stream Tables, as published by the National Board of Fire Underwriters, gives this identical value. Likewise from the chart the following values may be noted:

Discharge = 0.5 cu. ft. per sec.
Velocity = 15.7 ft. per sec.
Vel. head = 3.8 ft.

As a check on these last values we have

Discharge = $240 \times 0.00223 = 0.535$ cu. ft. per sec.

$$\text{Velocity} = \frac{Q}{A} = \frac{0.535}{0.0341} = 15.7 \text{ ft. per sec.}$$

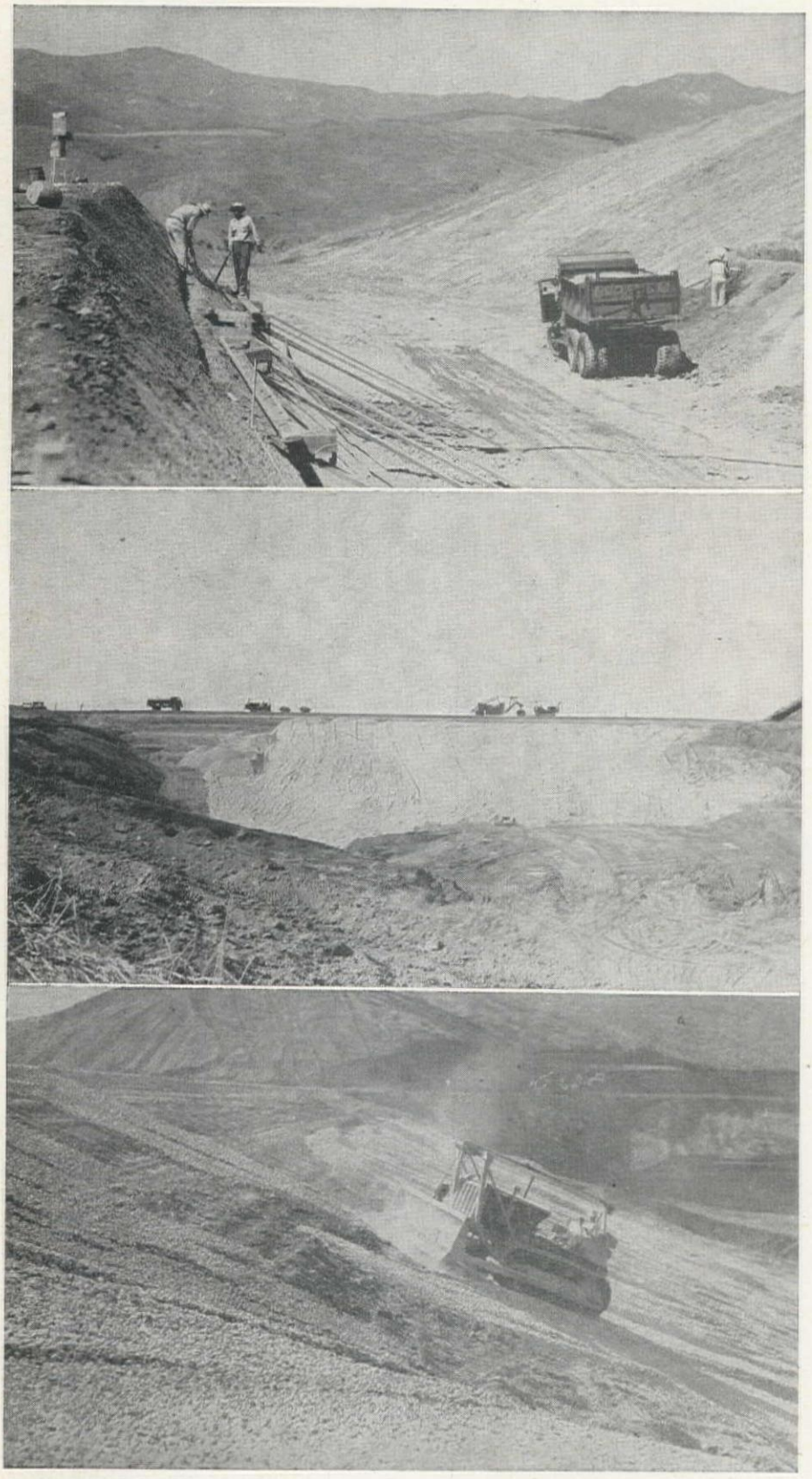
Starting with the required reach for the desired nozzle tip, the fire protection engineer obtains the necessary pressure at the nozzle and discharge. He then is able to work back, with the hose friction loss, to obtain the necessary hydrant or engine pressure.

[1] "Construction Design Charts," Revised Edition, Western Construction News.

Seattle Viaduct Construction Faces Temporary Stalemate

SEATTLE HAS BEEN ALLOTTED $1,935,000 for the construction of the Alaskan Way viaduct by the Washington State Development Board. Design of the structure has been under way for some months, and it has been hoped that construction might get under way on the $3,445,000 structure during 1947 in order to relieve some of the traffic congestion in the downtown area. The Public Roads Administration has been reluctant to grant federal aid for the project until complete results of the traffic origin and destination survey undertaken last summer are available. However, it appears that results of the survey will be delayed for some months, and decision as to what action to take with regard to construction of the viaduct is at a stalemate for the time being.

Construction Time Record Made on California Re-Regulating Reservoir



SPILLWAY EXCAVATION, Dos Pueblos Ranch Dam, top. During construction the dam was raised in 6-in. lifts, middle photo. To protect against wave action the upstream slope was covered with a gravel blanket 6 in. deep, bottom photo. The top of the dam is 20 ft. wide with a 6-in. crown and is surfaced with oil for road usage.

Dos Pueblos Dam, an earthfill structure 70 ft. high, located a few miles north of Santa Barbara, stores water from the natural run-off as well as serving as a re-regulating reservoir

DOS PUEBLOS Ranch, sixteen miles north of Santa Barbara, Calif. needed water for further development. It was elected, therefore, to build Dos Pueblos Dam to augment the existing million-gallon reservoir supply. The dam will serve as a re-regulating reservoir as well as for the storage of natural run-off.

The Donald R. Warren Co. was retained as engineer on May 20, 1946. By June 5, the foundation explorations had been completed, and on June 27 the final plans for the dam were submitted to the State for its review and approval. The contract for its construction was awarded to the Macco Corporation, and by July 15 equipment was at the site. Fifty working days later the Dos Pueblos Dam was completed in all details and was ready to store the first run-off of the 1946-1947 rainy season. Thus, pre-war construction speed and cooperation were displayed by the Signal Oil & Gas Co., owners, the Donald R. Warren Co., and the Macco Corporation in the construction of the dam.

Dos Pueblos Dam is on an unnamed tributary of the Dos Pueblos Creek, having a run-off of 1.3 sq. mi. The dam is 448 ft. long, 70 ft. high, and forms a 390-ac. ft. storage reservoir with a surface area of 17.3 ac.

Foundation studies

To provide information on which to base the safe and economical design of the Dos Pueblos Dam, a foundation investigation was made. Structural characteristics of the soil were determined by field investigation and laboratory analysis. Samples of the soil were obtained at frequent intervals from eight (8) bored holes varying in depth from 25 to 100 ft. It was found from the foundation exploration that a continuous hard black shale underlaid the site of the dam.

This result established the depth to the shale, and the information was made use of in the design of the dam to conclusively determine the position and depth of cut-off trench. Due to the relatively thin layer of clay and shale above the hard shale, very little foundation settlement could be expected after the initial settlement had taken place during construction.

The borrow pit located in the reservoir site (increasing the ultimate storage), was overlaid with black clay loam which was not suitable for inclusion in

the dam because of its organic content and resulting swelling and shrinking characteristics which change with moisture content. This material was used by the Signal Oil & Gas Co. in a soil conservation program at the ranch (not included in the dam project). Immediately below the layer of black clay loam was a light brown sandy clay extending to a depth of twenty feet or more. This material was used in the construction of the dam. An undesirable feature of the material is that it contains an average of 35 per cent clay particles, of which 20 per cent are fine colloids. This indicates that swelling and shrinking will take place with change in moisture. However, this is overshadowed by a favorable characteristic of the material, that of a very slow permeability rate. Thus, the moisture variation will be nominal for material at the center of the dam.

Earth fill

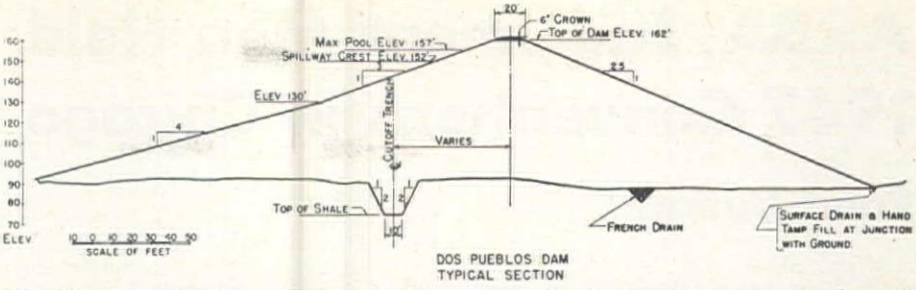
During construction the dam was raised in 6-in. lifts. Sheepsfoot rollers and moisture control were employed. A field soil laboratory was set up to expedite the construction and to enforce 95 per cent or better optimum compaction.

The upstream face below elevation 130 was changed in slope from 3:1 to 4:1, thus increasing the base width to give added safety, and guard against slippage due to a rapid drawdown. As additional safety, a French drain consisting of sand and graded gravel, and a 6-in. corrugated perforated pipe was placed halfway between the cut-off trench and downstream toe. This drain was placed in the original ground to intercept any percolation between the original and compacted earth, and drained beneath the dam at its lowest downstream point. The upstream slope was scarified, and 6 in. of gravel was placed and rolled for protection against wave action. On the downstream side Mesembryanthemum (ice plant) was planted for protection against erosion.

The top of the dam was made 20 ft. wide with a 6-in. crown and topped off with an oil surface, making it usable for roadway purposes.

Outlet works

The spillway cuts through natural ground just above the left abutment (looking downstream), is designed to handle a maximum capacity of 1,300 c.f.s, and discharges into a natural gully. This gully, protected by rip-rap, intersects the natural streambed below the dam. As originally planned, the spillway lining was reinforced concrete, with concrete anchors located at the crest and change of slope. In addition to the above-mentioned anchors, cut-off walls were located at the entrance and lip of the spillway. A gravel drain was located beneath the spillway to intercept any seepage, eliminating any chance of a static head causing damage to the spillway. Due to the non-availability of skilled labor and reinforcing steel, the spillway was expedited by changing to gunite section, still maintaining the reinforced concrete anchors and cut-off walls. During construction a 2-ft. ogee wall was placed across the spillway at the crest, thus increasing the storage, because it was found that the dam could be safely increased from elevation 160 to elevation 162, obtaining the maximum from the dam site, and not infringing upon the 5-ft. freeboard.



TYPICAL SECTION, above. Below, intake structure showing the heavy duty circular gate installations, gate stem to crest of dam, and movable steel trash rack to protect intake.

Considerable thought was given to the outlet works. Little siltation could be expected, due to the small run-off area of 1.3 sq. mi. and because most of the water to fill the reservoir was to be diverted from Dos Pueblos Creek. Due to the shallowness of the reservoir and the above reasons, it was decided to use one submerged outlet with the gate stem supported on bearings, extending up the upstream slope with an 18-in. hand wheel located on the crest of the dam. With a maximum head of 47 ft., an 18-in. Calco heavy duty circular gate having both seats equipped with ground bronze face was used. This was a considerable saving over the construction of an outlet tower. A movable steel trash rack (box shape) was placed over the intake for protection.

The 24-in. outlet pipe was imbedded in reinforced concrete and had four 6-ft. cut-off collars. This outlet pipe was laid on the original ground and connected to a valve house located just below the dam toe. At this point the water can be diverted into the existing ranch conduit system or by-passed.

This outlet pipe will also serve as an intake pipe, since the water from Dos Pueblos Creek is diverted by an existing diversion dam to the million-gallon reservoir and the excess flows by gravity through the intake pipe into the new Dos Pueblos Reservoir. Thus when the need for water is felt in the summer, the ranch will have two sources.

The dam was built under the direction of Garth Young, chief engineer of the Signal Oil & Gas Co. H. J. Schaufele, assisted by John E. Combs, was the resident engineer, and Ben Davies was the superintendent. W. A. Perkins represented the State Dam Department, and the topographic surveys were handled by U. S. Grant of Santa Barbara.

PERSONNEL, (left to right), BEN DAVIES, job superintendent; JOHN SAWYER, general superintendent for Macco; CARL E. NELSON, general manager of Donald R. Warren Co.; ED DAVIS, vice-president of Macco; DONALD F. WARREN of Donald R. Warren Co., and H. J. SCHAUFELE, resident engineer.

ARBA, Equipment Men Hold 1947 Conventions in Chicago

Road Builders

ADVOCATION of laws impressing upon labor unions the same responsibilities and obligations as confront the highway construction industry was announced by the American Road Builders Association at the conclusion of its 44th annual convention, held in Chicago Feb. 17-20. The resolution, copies of which were ordered to be sent to all senators and representatives, climaxed four days of meetings, during which 1,500 delegates listened to discussions of all types of basic highway problems.

The final resolution provided:

That unions should be required to make public annual statements of their finances.

That unionization of supervisory employees, secondary boycotts and jurisdictional strikes should be outlawed.

That there should be no compulsory unionism.

That unions should be prohibited from engaging in restrictive practices which would unnecessarily increase the cost of highway construction.

It was stated that labor-management troubles have seriously delayed the highway construction program for the last year and a half, and that through following up a resolution of this kind, all shackles may be removed from the vitally important construction program.

Need for more adequate highway facilities was the topic of major discussions during the convention. Increased maintenance costs, as well as the necessity for full reconstruction of 27,218 mi. of the national highway system, due to deterioration with age and neglect during the war were brought out. The three-lane highway also received attention when Major General Philip B. Fleming, Administrator of the Federal Works Agency and of the Office of Temporary Controls, declared it a veritable death trap, with an accident rate three times higher than on the four-lane road.

Revision of the condemnation laws of many states whose statutes now require cumbersome, time-killing procedures was urged by Thomas H. MacDonald, Commissioner of the Public Roads Administration, who claimed that slowness in acquiring land for new road construction and highway modernization is the greatest detriment to a long-range highway program. To serve the highway-using public efficiently, and to be built at reasonable cost, MacDonald said roads must not only be planned far in advance, but only when so planned can they serve as a cushion in times of economic depression. He also claimed the 1946 road building program was seriously handicapped by strikes and labor and materials shortages.

One hundred years of industrial progress was dramatized at a banquet held toward the close of the convention. Over 1,000 highway engineers, congressmen, manufacturing executives, highway officials, newspaper men and distributors of road equipment attended the banquet, which showed a dramatic corollary between America's total export trade and improved roads for the past hundred years. Charles M. Upham, engineer-director of the Association, received the George S. Bartlett Award for distinguished work in engineering in 1946.

Equipment Dealers

ELECTION OF NEW officers and the preparation and presentation of three resolutions highlighted the 28th annual meeting of the Associated Equipment Distributors, held February 12-15 in Chicago.

William A. Danner, of the Parker, Danner Co., Hyde Park, Mass., became 1947 president of the association, succeeding Frank B. McBath, Columbia Equipment Co., Portland, Ore. A. F. Garlinghouse, Garlinghouse Brothers, Los Angeles, Calif., was elected executive vice-president of the organization.

FRANK B. McBATH, retiring president of Associated Equipment Distributors, shown receiving an Indian blanket presented to him at the convention.

Other officers included: C. F. Halladay, Halladay-Dettman Co., Sioux Falls, S. D., vice-president; H. L. Burleson, Browning-Ferris Machinery Co., Dallas, Tex., vice-president; Vincent J. Sheridan, Sheridan Equipment Co., Ltd., Toronto, Ontario, Canada, vice-president; and Eldon M. Farnum, Allied Construction Equipment Co., St. Louis, Mo., treasurer.

Western directors included: A. F. Garlinghouse, Region 11; Fred M. Viles, Fred M. Viles & Co., Spokane, Wash., Region 12; Maxwell J. Lyons, Lyons Machinery Co., Little Rock, Ark., Region 13; R. L. Arnold, Arnold Machinery Co., Inc., Salt Lake City, Utah, Region 14; and Vincent J. Sheridan, Region 15.

Endorsement of apprentice training programs within the construction industry, recommended awarding of construction work contracts to the lowest qualified responsible bidder, and elimination of the escalator clauses in manufacturers' contracts were the three resolutions drawn up toward the close of the meetings.

Because of the huge contemplated volume of construction required throughout the nation, and the shortage of skilled mechanics and experienced personnel, it was stated, the association endorsed the apprentice training programs of the Associated General Contractors of America, the American Society of Civil Engineers, United States Department of Labor and other sponsors of similar programs. In reiteration of their policy as expressed by a previous resolution, the AED recommended, in the interests of efficiency and economy, that all federal, state, county and municipal construction work, when possible, be performed by the award of contracts to the lowest qualified responsible bidder.

After receiving complaints relative to the escalator clause required by some manufacturers, the AED urged elimination of the clause. They stated that since most of the government regulations pertaining to labor and materials costs have been removed, permitting manufacturers to purchase materials on a more definite price and delivery basis within a reasonable length of time, manufacturers could now eliminate immediately the escalator clause on all acknowledged orders which carry a promise of delivery on or before 120 days from date of acknowledgement, regardless of when the shipment is actually made.

Roger C. Slaughter, former Democratic representative of Missouri, spoke at one of the convention sessions, assailing Congressional delay in the enactment of new labor legislation. He demanded a law which would include a ban on the closed shop, stating that there can be no permanent industrial prosperity in this country without a labor policy, which the U. S. lacks today.

Kenneth R. Wells, assistant vice-president of the American National Bank and Trust Company of Chicago, urged continued credit regulations while a sellers' market in construction machinery exists. He warned against assuming long term obligations for new buildings, and remarked that down payment and balance payment terms should be liberalized only after competition became more severe.

WELL DRILLING at Buhl, Idaho, by the Idaho Power Co., proved to be embarrassingly successful. Between 800 and 900 ft. the drilling crew got a flow of 2,000,000 gal. per day which inundated about half of the town's business district before the flow could be shut off.

Plastiglaze Application Successful

Plastic coating enables contractors to use plywood forms longer — Resistant to water, salt air and mild acid solutions, Plastiglaze dries tack free one to two hours after application to form lumber and forms a shiny surface similar to varnish

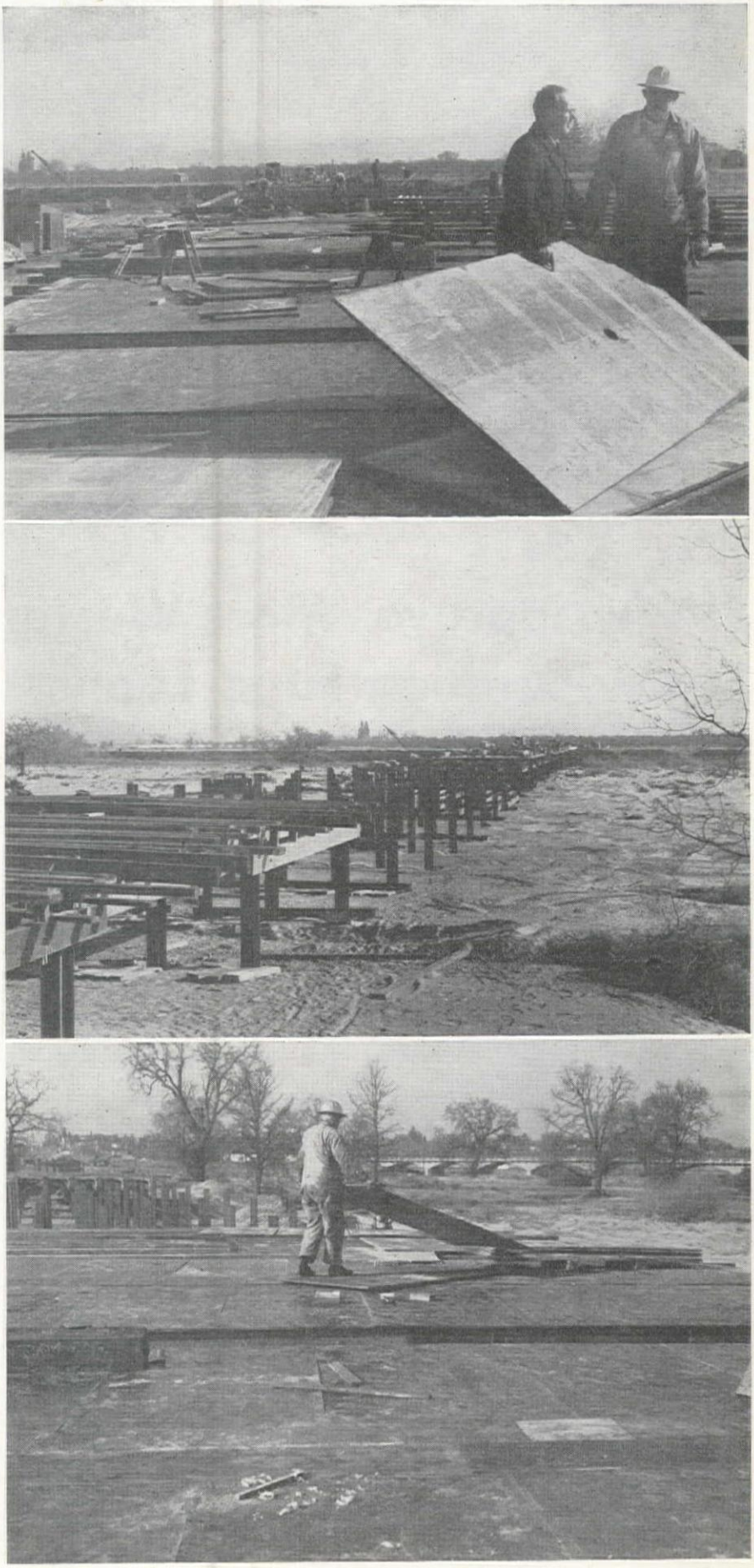
A NEW PLASTIC coating for plywood form lumber has been developed by the Calresin Corporation of Culver City, Calif., and its first major application has been made by J. D. Proctor, Inc. and B. W. Kuhn, general contractors of Richmond, Calif., on construction of bridges between Los Molinos and Red Bluff, Calif. They were awarded contract for five reinforced concrete slab bridges and the widening of two other concrete bridges on this stretch of highways by the California Division of Highways early last year. It was a $378,765 contract.

These contractors have found that the new plastic material enables them to use plywood forms over many times because it is impervious to water, salt air and mild acid solutions. It is relatively cheap to apply, but by increasing many fold the number of times a form panel may be used, it saves a considerable amount of money.

Plastiglaze is simple to apply. It may be brushed, sprayed or dipped onto the form lumber. It will dry tack free in from one to two hours at atmospheric temperatures, when it forms a shiny surface with an appearance similar to varnish. This surface is not destroyed by pouring concrete against it, nor is the wood deteriorated after the form is stripped. It may be piled in the weather until the next application but will be ready for immediate use at that time. As often happens, a vibrator or other tool may come in contact with the form and in those cases where the top layer of the Plastiglaze is chipped away a simple spot repair is sufficient to put the form back into service.

Accidental discovery

The use of the material on form lumber was discovered accidentally by Gene Wieczorek, an employee in the Los Angeles laboratory of the Del Riccio Co., where paper flower pots were being coated with the material and made absolutely impervious to water. He was working on a precast building panel made of cement and lightweight aggregate. Forms for these panels were made of plywood and common lumber and



PLASTIGLAZED plywood being inspected still looks new and glossy after it has been used ten times (top). Bridge under construction outside of Red Bluff has 14-in. I-beam pilings, is 1,100 ft. long (center). Plastic coated plywood nailed to trestle (below) preparatory to pouring concrete.

UNDERNEATH construction of the trestle deck forms. The 14-in. steel I-beam pilings are surmounted by a concrete beam and slab deck. J. D. Proctor, Inc., and B. W. Kuhn, contractors, are the first to make a major application of the plastic coating.

necessarily had to be replaced rather frequently. The use of form oil increased their life somewhat, but replacements were still necessary and it occurred to Wieczorek to coat the forms with Plastiglaze. He found that forms could then be used 26 times without any retouching whatsoever and after that only small brush applications were necessary to keep the forms usable. The size of the precast units in this operation was 6 ft. wide and 8 ft. high, with ribs each way every two feet.

The manufacturers then recommended the material to Proctor and Kuhn, who used it on form panels for the bridges in the above mentioned contract. These bridges are simple trestles consisting of 14-in. steel I-beam pilings surmounted by a beam and slab deck. Both Harry Erickson, general superintendent, and Joshua Pierson, engineer for the contractor, have given high praise to the Plastiglaze-treated forms. They find that by coating both sides and the edges of the forms no separation of the plys takes place and that a smooth, durable surface is made on the concrete. Erickson further remarked that he was coating all their construction shacks with Plastiglaze for protection against the weather.

FWA Approves More Western State Planning Fund Loans

The Federal Works Agency recently approved more advances to local communities in Western states for use as planning funds. These funds, to finance the preparation of plans and specifications for public works, are to be repaid, without interest, when construction is begun. Following appears a list of recent advances.

Alaska

The city of Ketchikan was granted two advances: one for plans for new sanitary diversion sewers, including mains and laterals, estimated cost $111,000, Federal advance $2,000; a new sanitary and storm water sewer system is also to be built, including mains and laterals to replace obsolete facilities. Federal advance for the project, estimated to cost $160,500, was $3,500. Ketchikan was also granted funds amounting to $5,000 for street paving and sidewalks, whose estimated cost is $252,000.

Arizona

Funds of $4,800 were made available to Mesa High School District of Maricopa County, for a lunchroom and shop building, also alterations to the present shop. Estimated cost is $127,500. Tucson was advanced $9,000 for an incineration plant, which is estimated to cost $224,000.

California

Arcadia City School District of Los Angeles County was allotted $21,000 for an elementary school estimated to cost $479,000. Auburn was given three advances: $1,200 for Maple Street grading, paving and widening estimated at $60,200; $900 for Harrison Street grading, paving and widening, estimated cost of which is $32,000; and $600 allotted for the reconstruction of approaches on the Cherry Street Viaduct, a job estimated at $23,900.

Eastside Union School District of Los Angeles County received $7,500 for a school at Lancaster, including library, classrooms, auditorium-cafeteria and administration unit, cost of which was estimated at $275,000. Fullerton Union High School and Junior College District was advanced $23,550 to finance the preparation of drawings and specifications for a high school classroom building at Fullerton, estimated to cost $514,292.

Gardena received three advances: $4,500 for a new court and police department building, estimated cost of which is $123,010; $5,300 for a new city hall costing $124,337; and $2,650 for new library additions, to cost $74,800. Inglewood also received three advances: for remodeling a fire station, estimated cost $54,000, Federal loan, $2,500; for a city garage, estimated cost $163,000, Federal loan, $7,000; and for a police station and jail estimated at $277,500, a Federal advance of $12,500.

Millbrae Elementary School District of San Mateo County received $10,800 for elementary school classroom additions at Millbrae, estimated at $218,350. Niland Sanitary District was advanced $5,950 for a sanitary sewer system at Niland, including treatment plant and outfall sewer, whose estimated cost was $131,755. Owens Valley Unified School District received $4,200 for an estimated $90,720 worth of classroom additions at Independence, including administration unit and toilet facilities.

Pleasanton Elementary School District of Alameda and Contra Costa Counties was granted two advances, both for projects at Pleasanton: an elementary school, estimated cost, $129,000, Federal advance, $7,200; and elementary school additions, estimated cost of which is $65,100, Federal loan $3,600.

Colorado

Arapahoe County School District No. 6 received a Federal grant of $10,600 for an elementary school at Littleton, estimated cost of which would be $275,000. A Federal advance of $91,500 to Grand Junction to finance the preparation of plans and specifications for a proposed $2,087,300 water supply system was also approved.

Hawaii

The City and County of Honolulu was recently advanced $20,000 by the Federal government for Wahiawa High School additions at Honolulu, including administration building, library, vocational units, gymnasium and auditorium, all at an estimated cost of $540,800.

Idaho

Driggs was awarded a Federal loan of $2,550 for a sanitary sewerage system, estimated cost of which is $79,580. Drainage District No. 4, Franklin County, was granted $1,600 for construction of a drainage ditch and laying of drain tile near Preston, at an estimated cost of $56,880.

Kansas

The Board of Education of Liberal, Seward County was allotted two advances: one for $1,500 for a proposed $42,000 industrial arts shop building; the other was for $6,250 for two grade school additions, to include classrooms and auditorium-gymnasiums, at a cost of $160,000.

Montana

Bozeman received a grant of $18,750 for a sewage treatment plant, whose estimated cost is $524,000. Browning was advanced $5,200 for grading and surfacing streets with asphaltic concrete at a cost of $113,753.

Conrad was given $8,450 for the grading, graveling and asphalt surfacing of streets, also construction of curbs and gutters at an estimated cost of $185,253. A grant of $1,750 was made to the same town for a sewage treatment plant and pump lift station, estimated to cost $39,800.

An advance of $7,100 was made to Helena for grading, bituminous paving, curbs and sidewalks at an estimated cost of $151,490. Lima was allotted $1,400 for water distribution system extensions costing $29,761. School District No. 1 of Valley County received $2,250 for a two-story addition to a school at Glasgow and remodeling, costing $77,641.

Nebraska

Edison, Dawson County, was granted $2,000 by the Federal agency for a sanitary sewage collection system and treatment plant, estimated to cost $43,942. Lexington, Dawson County, received three advances: one for $1,850 for sewage collection system additions costing $66,496; $3,000 for a sanitary sewage treatment plant estimated at $108,500; and a grant of $2,400 for proposed $86,735 storm sewer system extensions.

Oshkosh, Garden County, was given $1,200 for a sanitary sewage treatment plant and collection system extensions costing $32,726.

Nevada

Hawthorne School District No. 7 of Mineral County, Nevada, was advanced $4,500 to finance the plan preparation of elementary school additions at Hawthorne, estimated to cost $87,000. Elko received funds amounting to $4,000 for a new city building, estimated to cost $100,000. Pershing County was allotted $2,000 for a jail wing addition to the courthouse at Lovelock, estimated to cost $44,000.

North Dakota

The town of Bismarck received five advances from the Federal government: a grant of $1,600 for a new street lighting system for the business district, estimated to cost $55,800; $950 for widening of pavement and construction of curbs, gutters and sidewalks on Avenue A, Eighth Street and Ninth Street at a cost of $34,897; $1,600 for widening of pavement and construction of curbs, gutters and sidewalks on Second Street, Avenue A, Third Street, Rosser Avenue and Fifth Street, all of which will cost approximately $58,552; $850 for widening of pavement and construction of curbs, gutters and sidewalks on Rosser Avenue at a cost of $30,181; and $1,300 for widening of pavement and construction of curbs, gutters and sidewalks on Washington Street, Rosser Avenue, Mandan Street, First Street and Thayer Avenue, estimated cost of which is $46,785.

Grand Forks was granted two advances: $6,000 for water treatment plant additions amounting to $219,500; and $850 for remodeling of pumping station and installation of new pumps, at a cost of $30,690. Powers Lake, Burke County, also received two advances: $1,300 for a proposed $64,000 waterworks system, including well supply and storage tank; and $900 for a sanitary sewage collection system and treatment plant to cost $47,000.

Oregon

Benton County School District No. 170 was allotted $1,900 for a grade school at Philomath, estimated cost of which is $45,000. Portland received two advances from the Federal agency: $24,400 for a new central fire station, estimated to cost $810,156; and $24,000 for a new municipal court building, to cost $823,000.

West Union School District No. 1, Washington County, was granted $2,900 for a proposed $68,616 elementary school at West Union. Willamina was advanced $6,000 for a sanitary sewer system and treatment plant, estimated to cost $131,400. They also received $5,900 for a new water supply including storage facilities, supply main and filter plant, at an estimated $159,460.

South Dakota

Martin, Bennett County, received a Federal allotment of $4,800 for a sanitary sewage collection system and treatment plant, estimated to cost $133,931.

Texas

Brady Independent School District was granted $1,400 by the Federal agency for South Ward School additions at Brady, estimated at $40,000. Harrold Independent School District received $3,600 for a proposed $100,000 elementary school at Harrold, including classrooms, cafeteria, shops, music room and laboratory.

Parker County was allotted $15,500 for a county hospital addition at Weatherford, estimated at $460,000. Sul Ross State Teachers College received a Federal advance of $8,250 for a new boys' dormitory at Alpine, estimated to cost $315,000.

Utah

Lehi will use an $8,000 advance to finance the preparation of plans and specifications for a sanitary sewer system, including treatment plant, estimated to cost $286,700. Midvale was advanced $600 for plan preparation of a municipal irrigation system, consisting of spring development, pumping plant and pipeline, to cost an estimated $19,200.

Roy was granted $2,000 to finance preparation of drawings and specifications for sanitary sewer extensions and additional well water supply, including pump at a cost of $59,000.

Washington

A Federal advance of $22,300 to finance the preparation of plans and specifications for a senior high school, including auditorium, physical training facilities and vocational shops for Chehalis School District No. 302, Lewis County, was granted. Project is estimated to cost $624,000. Clallam County Public Utility District No. 1 received $5,900 for a new water distribution system at Port Angeles, estimated cost of which is $187,000.

Friday Harbor was granted $6,000 for replacement of water supply main and raising the height of the storage dam, at an estimated cost of $120,000. Grays Harbor County School District No. 118 was allotted $14,700 for a school addition to provide classrooms at Elma, estimated at $311,531.

Jefferson County Public Utility District No. 1 received $5,500 for plans for a waterworks system, including supply wells, at Quilcene, estimated cost of which is $105,000. King County Auburn School District No. 408 was advanced $30,000 to finance preparation of drawings and specifications for a junior high school at Auburn, estimated to cost $844,800. King County School District No. 414 was given two advances: one for $20,700 for plans for the second unit of a new high school at Kirkland, estimated at $787,660; and $7,500 for a two-story addition to elementary school at Redmond and its remodeling, estimated cost of which is $175,000.

Okanogan County Oroville District No. 405 was given a Federal advance of $4,300 for plans for additions to the grade school building at Oroville, estimated cost $90,600. The town of Oroville received $10,250 for a new sanitary sewerage system and treatment plant, estimated at $223,350. Spokane County received an allotment of $2,950 for a two-story addition to the high school at Millwood, estimated at $73,953.

Wyoming

Evanston was allotted $20,000 for plans and specifications for a water supply line and treatment plant, including water meters, estimated to cost $550,000. A Federal advance of $3,500 was approved for Pine Bluffs, to finance preparation of plans and specifications for grading and paving, including drainage, at an estimated cost of $65,736. Rock Springs was advanced $12,000 for a proposed $333,000 sewage treatment plant; and Shoshone was granted $3,600 to finance preparation of drawings and specifications for a sanitary sewer system, including treatment plant, estimated to cost $67,000.

Trustees of the University of Wyoming received four advances, all for projects at Laramie: an advance of $1,800 for a new Creamery and Dairy building, estimated cost $100,000; $3,100 for remodeling of the bookstore and Mechanic Arts building, estimated at $100,000; $9,500 for the proposed remodeling of the Old Main building at a cost of $250,000; and $17,200 for $500,000 additions to Knight Hall.

Western Association Officers—1947

A. S. C. E.

Arizona

Walter Johannessen, of Johannessen & Girand, Phoenix, takes over as Section president for 1947, with **G. L. McLane,** District Engineer, Bureau of Public Roads, Phoenix, serving as first vice-president. **John A. Baumgartner,** engineer, U. S. Geological Survey, Tucson, is second vice-president; and **Leigh Gardner** of Yost and Gardner, Phoenix, is secretary-treasurer. This Section plays host this year to the Annual Spring Meeting of the American Society of Civil Engineers, April 23-25.

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Seattle

E. B. Crane, assistant engineer for the Chicago, Milwaukee and St. Paul Railroad, was elected to the presidency of the Seattle Section of the American Society of Civil Engineers at their recent annual meeting. Other officers elected at that time were: **Bertram P. Thomas,** vice-president; **T. H. Campbell,** secretary-treasurer. Thomas is chief of the planning section for the U. S. Army Engineers, while Campbell is an associate professor in Hydraulics at the University of Washington. Life membership certificates were formally presented at the meeting to **Ray M. Murray, Hans Mumm, Jr., M. D. Williams,** and **Oscar A. Piper.**

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Sacramento

Newly elected officers of this Section were installed at the annual dinner-dance, held January 17. **Stewart Mitchell,** staff bridge engineer with the Bridge Department of the California Division of Highways, has taken over the job of president, with **Arthur J. McNeil** and **Henderson E. McGee** as first and second vice-presidents respectively. **F. W. Robison** is new secretary.

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San Francisco

S. T. Harding is the recently elected president of this Section, with **L. H. Nishkian** and **L. A. Elsener** as vice-presidents, and **J. E. Rinne,** secretary-treasurer. These officers, together with **T. P. Dresser,** past-president, constitute the Section's Board of Directors for 1947.

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Los Angeles

Charles R. Compton, Assistant Chief Engineer, Los Angeles County Sanitation Districts, presides as president of the Los Angeles Section for 1947. **Ray L. Derby,** Assistant Sanitary Engineer for the Los Angeles Department of Water & Power, and **Finley B. Laverty,** Chief Hydraulic Engineer, Flood Control District, Los Angeles County, have been named as vice-presidents. **George E. Brandow,** of Brandow & Johnson is the new secretary, with **David M. Wilson,** professor of civil engineering at the University of Southern California, as treasurer. **Wallace L. Chadwick** and **Markham E. Salsbury** are past presidents of the organization.

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Tacoma

Charles E. Andrew, consulting engineer for the Washington State Toll Bridge Authority, was chosen president of the Tacoma Section recently, succeeding **Fred M. Veatch.** Other officers for 1947 include **J. H. Stockhouse,** vice-president; **N. E. Olson,** director; and **H. J. Whitacre,** secretary-treasurer.

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Colorado

New officers of the Colorado Section of ASCE are **Russell W. James,** president, **Alfred J. Ryan,** vice-president, and **Carl A. Gould,** secretary-treasurer.

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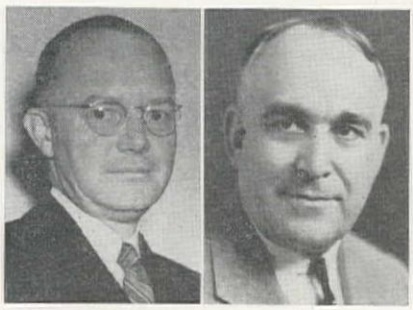

JAMES WOOLLEY

Intermountain

Ralf R. Woolley is the newly elected president for this Section. Wooley is the hydraulic engineer for the Geological Survey at Salt Lake City. **Erwin U. Moser** and **Douglas K. Jones** are vice-presidents, and **Carl E. Painter** is secretary-treasurer.

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San Diego

Officers for the year 1947 include **Philip W. Helsley,** former vice-president, who now heads the Section as president, **F. B. Stewart,** vice-president, and **M. J. Shelton,** secretary-treasurer.

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Montana

Paul M. Johnson of Helena has been elected president of the Montana Section, succeeding **C. S. Heidel.** Other officers of the section for this year include **Fred E. Thieme,** Missoula, first vice-president; **Wilbur S. Hannah,** Billings, second vice-president; and **E. H. Thomas,** Helena, secretary.

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Oregon

Norbert H. Leupold, president of Leupold & Stevens of Portland, was elected president of the Oregon Section. Other officers of the section for 1947 include **Glenn S. Paxson,** Salem, first vice-president; **Theron W. Ragsdale,** Portland, second vice-president; **Guy H. Taylor,** Portland, secretary; **Thomas M. Davis,** Salem, treasurer; and **Claire G. Tittle,** Portland, assistant secretary.

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Spokane

William P. Hughes, city engineer for Lewiston, Ida., was recently elected president of this Section, with **Harold J. McCoy,** Spokane, Wash., serving as 1st vice-president. **Allen S. Janssen,** Moscow, Ida., is the newly elected 2nd vice-president, and **William A. Hill,** Spokane, is secretary-treasurer.

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National

On the eve of the 94th annual meeting of this oldest of American engineering groups, **Edgar M. Hastings,** Richmond, Va., was elected president of the American Society of Civil Engineers for 1947. Hastings, Chief Engineer of the Richmond, Fredericksburg and Potomac Railroad Company, was named following tabulation of results of a mail ballot conducted among the society membership throughout the country. Two new vice-presidents and seven new directors were also named. Vice-presidents are **Gail A. Hathaway,** Special Assistant to the Chief of Engineers, U. S. A., Washington, D. C., and **Professor Ralph B. Wiley,** head of the civil engineering school at Purdue University.

Directors named in the balloting are: **Harland C. Woods,** senior civilian engineer in the District Office of the U. S. Engineer Department, Buffalo, N. Y.; **Roy W. Crum,** Director, Highway Research Board, National Research Council, Washington, D. C.; **Professor Lewis M. Gram,** recently retired chairman of the University of Michigan's civil engineering department; **Samuel A. Greeley,** Chicago consulting engineer; **Professor Daniel V. Terrell,** Dean of the College of Engineering and Director of the Engineering Experiment Station at the University of Kentucky; **Walden L. Malony,** consulting engineer of Spokane, Wash., and **David L. Erickson,** city engineer of Lincoln, Neb.

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A. G. C.

Southern California Chapter

Approximately 500 contractors and industry suppliers were present recently at the Biltmore Hotel in Los Angeles when **M. F. Kemper** was installed as president of the Southern California Chapter of AGC, succeeding **R. F. Rasey** of Winston Bros. Co. **Harry James,** Guy F. Atkinson Co., **Thomas H. Paul,** Peter Kiewit Sons' Co., and **Wm. Curlett,** Curlett & Harwood, Inc., were installed as vice-presidents. New treasurer is **Harry Friedman** of the Contracting Engineers, Inc.

Directors include **J. A. McNeil, John MacLeod, Stanley Ball, Vincent Bressi, G. W. Abernathy, Edward Green, A. L. Pozzo, Harry Cunningham, J. P. Shirley, Jr.,** and **Herbert F. Murphy.**

Mountain Pacific Chapter

L. Paul Fiorito heads the Mountain Pacific Chapter's roster of 1947 officers as president, succeeding **John Rumsey.** Other Chapter officers include **Wayne Sutton,** Washington Asphalt Co., vice-president, and **J. E. Beardsley,** General Construction Co., treasurer. Members of the board of directors include **John Rumsey, Elmer J. White, Harry Hawkins, J. D. Shotwell, J. A. Troxel, John Ward, Stuart Norris, T. H. Youell, Dan Fiorito, Gil Griffin, Ivan Bruensbach,** and **Charles Kerr,** associate member.

FIORITO **MONAGHAN**

Colorado Contractors Association

The Colorado Contractors Association, affiliated with the AGC, chose **J. H. Monaghan,** of J. H.- N. M. Monaghan & Associates, as their president for 1947 at a recent meeting. Other officers elected at that time were **C. L. Hubner,** first vice-president; **Royden S. Massey,** second vice-president; **Dan G. Bell,** secretary-treasurer. Directors elected included **Carroll Brown,** Pueblo; **Ed. H. Honnen,** Colorado Springs; **C. B. Berry, A. S. Horner, R. J. Lawrence, Hoyle Lowdermilk** and **M. J. Sears,** all of Denver.

San Diego Chapter

Bruce R. Hazard officiates as San Diego Chapter's new president, succeeding **E. F. Bryans,** retiring president. **Walter Trepte** was elected vice-president, and **E. F. Bryans, I. C. Curry, H. L. Foster,** and **Andrew N. Baird** are additional directors. **M. A. Mathias** is Chapter manager.

Northern California Chapter

George H. Atkinson, of the Guy F. Atkinson Co., San Francisco, is now presiding as president over meetings of the Northern California Chapter. Other officers elected by the board of directors at a recent meeting included **Al Biasotti,** Louis Biasotti & Son, Stockton, vice-president; and **H. Earl Parker,** of H. E. Parker, Marysville. **Winfield H. Arata,** secretary-manager, and **Florence Smith,** assistant secretary, were both reappointed by the board. Directors now include **Geo. H. Atkinson, Talbot D. Bailey, Gordon H. Ball, Al Biasotti, Chas. L. Harney, Lloyd E. Holton, Geo. C. Loorz, H. C. Maginn, B. F. Modglin, H. Earl Parker, Robert N. Pomeroy,** and **A. G. Raisch.**

Atkinson, Harney and Arata attended the Annual National Convention of Associated General Contractors, which was held at the Stevens Hotel in Chicago the latter part of January.

Intermountain Chapter

Intermountain members of the A. G. C. chose **Grant Thorn,** A. O. Thorn and Sons Construction Company, Springville, Utah as their new president at a recent meeting in Salt Lake City. Other officers elected were **Ellis W. Barker,** Ellis W. Barker Co., Salt Lake City, vice-president; **G. M. Paulson,** Tuah Construction Co., Salt Lake City, secretary-treasurer; and **Perce Young, Albert Whitmeyer, Pat Gibbons, Edward Clyde, Frank B. Bowers,** and **Carl E. Nelson,** directors.

Portland Chapter

Portland Chapter recently chose **Donald Hall** of E. C. Hall Co., Portland, as president for 1947, succeeding **Louis Peacock.** Other officers of the Chapter include **Marshall Newport,** first vice-president; **A. B. McEachern,** second vice-president; and **Carl A. Schram,** secretary-treasurer. **P. L. Crooks, Sr., Natt McDougall,** and **J. C. Compton** were elected honorary directors. The membership of the board of directors includes **K. F. Jacobsen, G. E. Kibbe, H. A. Kuckenberg, G. W. Lind, M. J. Lynch, Frank Lyons, Ray Northcutt, Fred H. Slate,** and **J. R. Winninger.** Also serving on the board, in addition to the elected directors and the honorary directors, will be past presidents of the Chapter **S. S. Montague, Jack McDougall,** and **Louis Peacock.**

HALL **EARLY**

Central California Chapter

At the annual meeting of this Chapter recently, the following men were elected to the board of directors: **Fred J. Early, Jr.,** Fred J. Early, Jr., Co.; **Henry A. Knutzen,** Peter Kiewit Sons' Co.; **Robert McCarthy,** Robert McCarthy Company; **Art B. Smith,** Engineers, Ltd.; **Harold W. Smith,** Dinwiddie Construction Co., Inc.; **Carl N. Swenson,** Carl N. Swenson Co., and **Geo. W. Williams,** Williams & Burrows, Inc.

Nevada Chapter

New officers of the Nevada Chapter of A. G. C. are headed by **E. J. Maupin, Jr.,** as president. Others include **E. E. Games,** first vice-president; **Ludwig Flyge,** second vice-president; **C. V. Isbell,** treasurer; **Chas. L. Hill,** secretary-manager, and **Lyell Kofoed,** assistant secretary. **Wm. J. Cashill** is association attorney. Included on the board of directors are **A. D. Drumm, Jr., Flyge, Isbell, Games, Maupin, O. J. Scherer,** and **F. R. Smith.**

Spokane Chapter

Gus J. Bouten is new president of the Spokane Chapter, A. G. C., with **George Seebeck** and **J. C. George** as vice-presidents and **Arthur Sather** and **J. L. Hazen** as directors.

Arizona Chapter

At a recent luncheon meeting of the entire membership, **Edward O. Earl,** president of the San Xavier Construction Co., Tucson, Ariz., was elected president of the Arizona Chapter of A. G. C. **P. W. Womack,** president of Womack Construction Co., Phoenix, was re-elected vice-president. **D. W. Kelley,** newly elected director, was also appointed treasurer by the board of directors of the chapter, while **Joseph P. Condrey** was reappointed executive secretary. The board of directors, besides Earl, Womack, and Kelley, consists of **H. L. Royden,** past president, **I. G. Beall,** Phoenix, and **M. O. Packard, Jr.,** Phoenix.

Montana Chapter

L. M. Sheridan was recently chosen president of the Montana Contractors' Association, Inc. **D. J. Mooney** officiates as vice-president, while **Rex Fuller** is the new secretary-treasurer. **Morris O'Brien,** Great Falls, has been elected as a director to succeed **W. P. Roscoe** of Billings. **George Nilson,** Great Falls, was re-elected director.

Seattle Chapter

John H. Sellen will serve as president of the Seattle Chapter, A. G. C. for 1947, with **Walter W. Harfst** as his first vice-president. **M. P. Butler** is second vice-president; **James Cawdry,** secretary; and **Howard Lease,** treasurer. Members of the executive committee include **Don Mowat, W. G. Clark** and **J. B. Warrack. C. Lloyd Gilbert** has been acting manager of the Chapter since the death two months ago of **Chauncey Smith.**

Idaho Chapter

New president of the Idaho Branch of A. G. C. is **Ernest White,** Twin Falls, who succeeds **W. H. Puckett,** Boise. Other officers elected include **Fred Hoops,** Twin Falls, vice-president; **L. D. Robins,** Boise, treasurer; **Duffy Reed, Jr.,** Twin Falls and **Roscoe Cahoon,** Pocatello, directors.

Montana Builders Assn.

Don McKinnon of Helena has been elected to head the newly organized building contractors group in Montana which will be known as the Montana Builders Association. Other officers elected for the

first year include **Floyd Pappin**, Great Falls, vice-president; **Charles Pew**, Missoula, **William Lowe**, Billings, and **Eddie O'Neil**, Havre, directors. Members of the group, which includes 20 building contractors of the state, selected **Ned Hergert** as secretary-treasurer and manager of the association. Hergert is also manager of the Montana Contractors Association, and has recently opened offices in the Placer Hotel which will be the headquarters for both organizations.

* * *

Other Groups

Colorado Society of Engineers

Paul K. Seyler, radio engineer of the Mountain States Tel. & Tel. Co., was elected to the presidency of the Colorado Society of Engineers at a recent meeting. **Dr. C. E. Dobbin**, principal geologist, U. S. Geological Survey, took over the job of vice-president, with **C. M. Lightburn** as secretary-treasurer. Those elected to the board of directors included **Dana E. Kepner, Carl E. Dahlquist, George M. Hatfield, A. A. Matthews, John McGowan, A. J. Ryan, Walker R. Young**, and **Adolph Zulian.**

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SEYLER **MOORE**

No. Calif. Structural Engineers

William W. Moore is the 1947 president of the Structural Engineers Association of Northern California. Moore is a member of the engineering firm of Dames and Moore. **John A. Blume**, consulting structural engineer of San Francisco, was elected vice-president. The new director is **R. D. Dewell**, consulting structural engineer. Held over directors are **Mark Falk** and **M. V. Pregnoff**, also consulting structural engineers.

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Reno Engineers Club

At a recent election meeting of the Reno Engineers Club, **Edward L. Pine** was named to succeed **G. G. Hall** as president. **Walter Herz** was elected vice-president; **Merle Atcheson**, secretary, and **A. C. Bruhns** and **Philip S. Cowgill**, directors.

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Engineers Club of Fresno

New officers of the Fresno Engineers Club include **J. P. McElroy**, president; **H. M. Patton**, vice-president; and **R. E. Dunkle**, secretary-treasurer of the organization.

East Bay Engineers Club

Members of the East Bay Engineers Club chose **R. G. Rothganger**, industrial power engineer with the P. G. & E., as their president at their annual election meeting. **Thomas B. Bridges**, president of the Heald Engineering College, was re-elected secretary-treasurer, with **Herman V. Leffler** recording secretary. Advisory board consists of **A. Vander Naillen, Jr.**, now in his 20th year as member of the board, **G. L. Harrison, Henry Lenninger, Romaine Myers**, and **Victor Sauer. Raymond B. Giles** is chairman of the program committee, with **Bruce Brownlea** as sergeant-at-arms.

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Oregon Professional Engineers

C. E. Canada, sales engineer for the General Electric Co. in Portland, was chosen president of the Professional Engineers of Oregon. **Carl E. Green**, sanitary engineer associated with John W. Cunningham, was elected vice-president of the organization. Other officers for the year include **Bertram G. Dick, H. O. Ervin, R. W. Deardorff, J. K. Kroeker**, and **Charles McClure**, all trustees. **J. A. Corenbaum** is secretary-treasurer.

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B. C. Building Contractors' Association

The election of **Charles Thorn**, prominent Vancouver, B. C., building contractor, to the office of president of the association was announced recently. **Charles Wilson**, Nanaimo, is vice-president.

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Associated Engineers of Spokane

H. C. Bender, member of the American Society of Civil Engineers, recently became president of the Associated Engineers of Spokane. Other officers elected at the same time were **Noel E. Thompson**, vice-president, and **H. Jack Reeves**, secretary-treasurer. **J. S. McGivern** is president, ex officio.

* * *

Stockton Engineers Club

Frank A. Bellato, mechanical engineer and designer of asparagus washing and packing machinery, was named president of the Stockton Engineers Club at a recent meeting. Other new officers include **Richard V. Potter**, vice-president, and **Myron Bear**, secretary-treasurer. Potter, formerly a major in the United States Engineers, is now engineer with the Division of Highways. Bear is office engineer for the County Highway Department. **J. Upton Clowdsley**, architect, and **Fred Spiekerman**, concrete pipe manufacturer, were both appointed to the executive committee.

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Idaho Engineers Society

New president of the Idaho Society of Engineers is **L. E. Stalker**, Idaho Falls, who was elected at the annual convention of the society in Boise recently. Also elected were **Orland Mayer**, Boise, vice-president; **Virgil Johnson**, Boise, secretary; **A. L. Biladeau**, Boise, treasurer. Outgoing president is **James Reid**, newly designated director of highways.

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So. Calif. Structural Engineers

Richard W. Ware is the newly elected 1947 president of the Structural Engineers Association of Southern California, with **S. B. Barnes** serving as vice-president and **Samuel Hobbs** as secretary-treasurer. Members of the board of directors include **Richard W. Ware, S. B. Barnes, Harry W. Bolin, Ernst Maag, Ernest C. Hillman, Jr., Geo. E. Brandow**, and **L. T. Evans.**

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Vancouver General Contractors

Ralph C. Pybus, manager, Commonwealth Construction Company, Ltd., has been elected president of the Vancouver, (B. C.) General Contractors' Association at the annual meeting held recently in the Hotel Georgia. He succeeds **H. H. Johnson** of Smith Bros. & Wilson, Ltd. Other officers include: first vice-president, **F. J. Dawson**; second vice-president, **L. G. Murray**; directors, **J. G. Bennet, A. J. Armstrong, W. D. Lee, D. McAlister** and **J. Tucker.**

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Construction Employers Council

E. S. McKittrick, prominent general contractor and former past president of the Associated General Contractors of Southern California, was reelected for a second term as president of the Construction Employers Council of Southern California. Other new officers were **A. D. Hoppe**, vice-president; **Joe Herman**, reelected secretary-treasurer. The executive committee consists of **E. S. McKittrick, A. D. Hoppe, Joe Herman, Frank Hess** and **Glen Arbogast.** The council was formed in 1944, with **Ford J. Twaits** as its first president.

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Tacoma Engineers Club

Fred Veatch is 1947 president of the Tacoma Engineers Club with **J. Lester Sharp** officiating as first vice-president. Other officers include **Carl F. Pflugmacher**, 2nd vice-president and **John W. Judy**, secretary-treasurer. The executive committee is composed of the above officers plus **R. E. Chase**, past president; **N. W. Temple, Col. E. P. Antonovich, David Countryman**, and **W. D. Whinery.**

* * *

Washington Engineers and Architects

W. L. Thrailkill, assistant general manager and director of the Washington Water Power Co., Spokane, Wash., has been elected president for the western area of the National Society of Professional Engineers.

West Proposes World Trade Center

San Francisco considered as site for organization to consolidate all activities pertaining to world trade in a central area—Fifty-five million dollar proposal thought desirable

SAN FRANCISCO, tenth largest city in the United States, and possessor of one of America's finest harbors, is the proposed site for a $55,000,000 World Trade Center, a device to simplify the complexities of all foreign trade procedures and to stimulate trade between the United States and other nations of the world.

Desirability and feasibility of the project, which calls for consolidation of all activities pertaining to world trade into a central area adjacent to both harbor facilities and the business and financial district, was supported by the Board of State Harbor Commissioners for the Port of San Francisco in their report to the California Legislature January 13. The board, composed of Thomas Coakley, W. G. Welt, and N. Loyall McLaren submitted their favorable conclusion after study of a report by Dr. Tadeusz B. Spitzer, independent study of material in the files of World Trade Center, Inc., a non-profit organization set up three years ago, and numerous conferences with interested parties. They claimed the project is desirable not only from the standpoint of development of foreign trade, but that it will inevitably create greater opportunities for employment.

The project, which has already been approved by a large group of San Francisco businessmen, is now only awaiting passage of legislation by the State to become a reality. It calls for the setting up of a State World Trade Center Authority, similar to the Toll Bridge Authority which built the Bay Bridge, with a companion bill from the legislature which would permit the authority to issue revenue bonds. Trustees of the World Trade Center are confident the project can be financed on a self-liquidating basis.

Spitzer's report to the Board was a complete analysis of the entire problem, including recommendation of a suitable location, economic prospects, and financial soundness. Three alternative locations were presented, all of which were in San Francisco within the angle between Market Street and the Embarcadero extending West as far as Battery Street. These sites are all within walking distance of the Ferry Building, as well as the financial and business districts. North-south boundaries would be either: 1) California and Washington Streets; 2) Sacramento and Jackson Streets; or 3) Clay and Pacific Streets.

Need emphasized

Need for a western World Trade Center was emphasized by Spitzer, who stated that such a project on the west coast would provide facilities to make the West's richness accessible for international trade, would attract industry to develop potential resources, and would provide employment for a large number of people.

Since World War II, it was claimed, Europe's industries have been crippled, with the result that the Far East and the Pacific Basin are becoming more important in international trade. New and diversified industries have been established in the western part of the United States, and they are developing rapidly.

Under the proposed plan, all people connected with international trade would have offices in this center. This would include the pertinent authorities, people, companies, activities, and facilities of international commerce. Representatives of labor connected with harbor activities, organizations of management in world trade, and export and import companies would also be located there, as well as consulates, foreign trade associations, and world trade departments of the Chamber of Commerce.

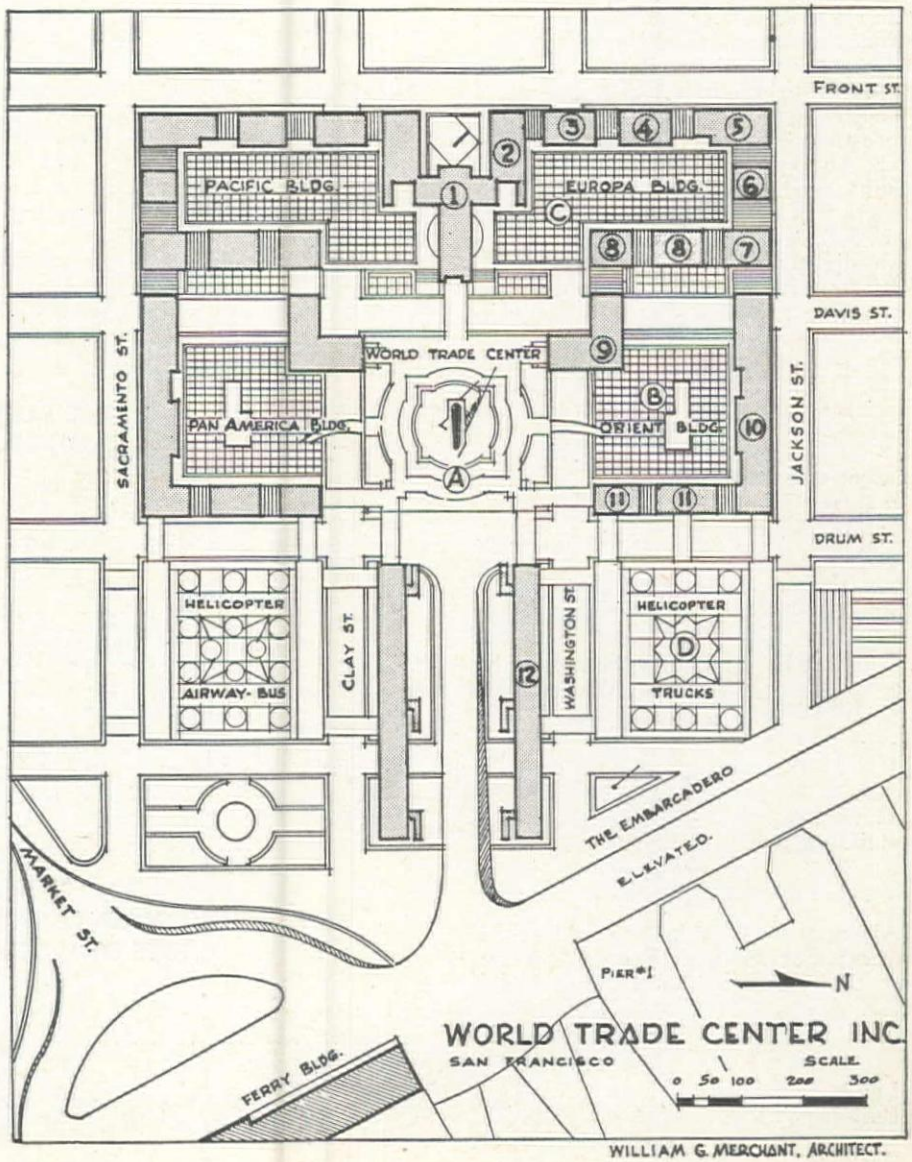
San Francisco as site

San Francisco, it was pointed out, was the logical site on the West Coast for such a project. In five years the Bay region gained about 46.6 per cent in population whereas the average increase for California was about 34 per cent.

The San Francisco Greater Bay area has the decidedly highest per capita buying power ($2,333) and retail sales in California, according to Spitzer.

All of Northern California gravitates toward San Francisco Bay area harbors.

The San Francisco Airport, which ranks among the ten major terminals of



TWELVE types of buildings to be constructed in the proposed Trade Center are: Bldg. 1, behind Theme Monument (top of Bldg. A), 30 stories high; No. 2, 20 stories; Nos. 3 and 4, 18 and 10 stories; No. 5, 14 and 10 floors; Nos. 6 and 7, 8 and 4; No. 8, 6 and 3 stories; No. 9, 3; No. 10, 6; No. 11, 6 and 3; and No. 12, 4 floors.

the United States in volume of air carriers for domestic and international passenger, mail, and cargo service, is now embarking on a five-year plan of development. When completed, it will become one of the foremost international airports, with facilities for 7,500,000 passenger accommodations yearly, plus adequate tonnage for mail and cargo.

The northern California city maintains first place on the West Coast in waterborne foreign commerce, being linked by about 180 different lines with all important harbors of the world.

Construction alternatives

Proposed construction costs of the World Trade Center have been figured on two different time schedules. The first takes into account a continuous program of construction, to completion of the project, which would probably take from four to five years. The other schedule provides that construction be done in three consecutive but not necessarily continuous portions. This will take from eight to ten years.

The four to five year schedule would give a year and a half to two years for moving of present owners and area redevelopment, and 2½ to three years for construction of the total project.

The long-range program would allocate 1½ to 2 years for moving of present owners and area redevelopment. Two more years would be allotted for construction of buildings No. 1, 2, 3 and 4 (see accompanying drawing) furnishing more than 800,000 sq. ft. of gross floor area. An experience period of one year would then be tried, before starting construction of the second group, buildings Nos. 5, 6, 7, 8, and C, which would furnish slightly more than an additional 700,000 sq. ft. of gross area. Another experience period of a year would be utilized before construction began on the third and final group of buildings, Nos. 9, 10, 11, 12, A, B, and D, which would furnish an additional 1,500,000 sq. ft. of gross area.

Budget estimates

The World Trade Center calls for a budget of $55,000,000. While no completely accurate estimates have yet been made, County assessments give the following figures for the various San Francisco sites:

Alternative I — 9 blocks bound by the streets: California, Front, Washington, and Embarcadero. Total area 735,390 sq. ft.

	Total	Per sq. ft. (approx.)
Land	$1,780,340	2.42
Buildings	1,625,040	2.21
Total	$3,405,380	4.63

Alternative II—9 blocks bound by the streets: Sacramento, Front, Jackson, and Embarcadero. Total area 676,570 sq. ft.

	Total	Per sq. ft. (approx.)
Land	$1,317,060	1.93
Buildings	1,003,190	1.47
Total	$2,320,250	3.40

Alternative III—12 blocks bound by the streets: Clay, Battery, Pacific, and Embarcadero. Total area 787,630 sq. ft.

	Total	Per sq. ft. (approx.)
Land	$1,458,750	1.85
Buildings	1,327,500	1.68
Total	$2,786,250	3.53

Construction

William G. Merchant, planning architect for the World Trade Center, estimated construction costs for the project. In general this item constitutes the overall picture of the cost of all structures from 1 to 12 (see illustration) composing the nine square blocks as drawn in the architect's plan. Buildings are of Class A and B construction, comprising in the main, offices, lofts, stores, and exhibit space.

General scheme of the World Trade Center is based upon the idea of allowing all streets to run through, with ramps, stairs, elevators, and escalators servicing the second floor open court areas. Transportation over these elevated court areas can be accomplished by small motorized conveyances over bridged streets, connecting all buildings at the second floor level. The main exhibit and store areas would be situated on the first and second floors facing streets and courts.

Structures "A" and "D" are clean-cut buildings, separated from the others by streets and only connected at the second floor level by bridges, while "C" and "B" are more or less considered the first, or ground floor, of all structures superimposed thereon.

Building "A" comprises a three-story garage with the lower story submerged, the roof of which carries the Theme Monument. It was further intended to use the space below the long ramp for auto storage, but until an elevated freeway can be constructed, the open area would probably be used for auto parking, in addition to Building "A." The Grand Ramp has not been included in the estimate.

Type "D" structures would consist of three stories, with a large central court running the full height. These buildings are primarily transportation buildings and carry a roof suitable for "helicopter" landings.

Foundations

The entire architect's project, used as illustration, would be situated upon a low bearing soil which necessitates considerable piling. A pile would probably have to be driven for each 25 sq. ft. over the entire constructed area, which would require approximately 27,000 piles. This amount has been estimated figuring on an average of 100 sq. ft. to each pile.

Twelve types of buildings are to be constructed, according to Merchant's plan. Total gross area of all buildings would be 1,779,060 sq. ft.

Rentable area in the type "A" buildings would comprise 70 per cent of the total area. An unusually high factor of 30 per cent is provided for corridors, washrooms, lockers, and other service areas. Usually a service factor of 25 per cent is considered sufficient for a building, with 75 per cent as rentable space thought practical.

For type "B" buildings, 80 per cent is thought to be rentable.

Following appears a capital investment budget for the construction of a World Trade Center, together with a chart of operating, maintenance, and administration costs. All estimates have been adjusted to costs as of November, 1946.

CAPITAL INVESTMENT BUDGET FOR THE CONSTRUCTION OF WORLD TRADE CENTER IN SAN FRANCISCO

	Amount	Per cent of total
1. Site acquisition	$ 5,200,000	9.45
2. Preliminary development	2,350,000	4.27
3. Construction	25,705,000	46.73
4. Foundations	3,000,000	5.46
5. Upper floor utility space	2,546,000	4.63
6. Bridges, ramps, monuments, etc.	1,500,000	2.73
7. Contingencies	2,100,000	3.82
8. Reserve for increased construction costs	500,000	.91
9. Architects' and engineers' compensation	1,500,000	2.73
10. Legal fees	175,000	.32
11. Permits and inspection fees	100,000	.18
12. Administration	825,000	1.50
13. Promotion	275,000	.50
14. Miscellaneous	350,000	.64
15. Taxes	1,004,734	1.82
16. Insurance	100,000	.18
17. Dead interest during time of construction	5,500,000	10.00
18. Financing	2,200,000	4.00
19. Over all budget reserve	69,266	.13
Total	$55,000,000	100.00

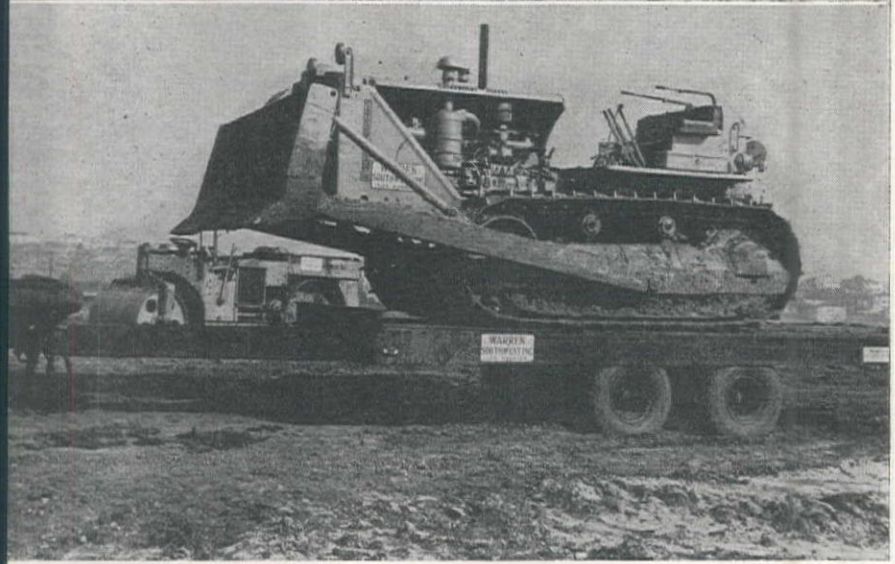
OPERATING, MAINTENANCE, AND ADMINISTRATION COSTS OF WORLD TRADE CENTER

Classification	Rentable area (in sq. ft.)	Yearly costs per sq. ft. (in cents)	Yearly costs for entire rentable area (in dollars)
Offices	1,086,876	123.8	$1,345,552
Stores	177,530	109.0	193,507
Lofts	315,000	80.5	253,575
Other	610,000	68.1	415,410
Helicopter landing space and parking area	150,000	50.0	75,000
	2,339,406		$2,283,044

The above gives an average of $0.976 per square foot.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD



Truck Has 18-ft. Elevating Reach

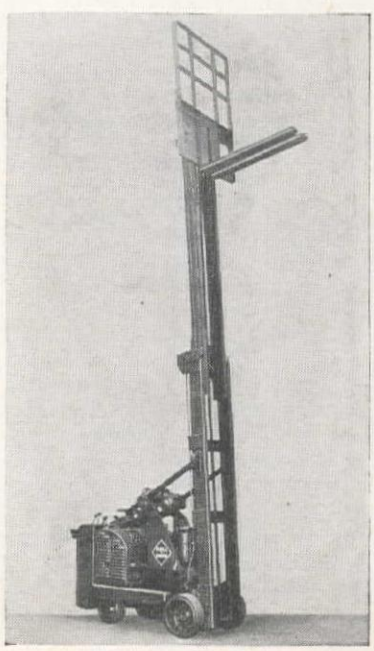
AN INNOVATION in the field of fork-type industrial trucks was announced by the Elwell-Parker Electric Co., Cleveland, O., with their introduction of a machine with an elevating reach of 18 ft. above floor level. Standard models heretofore have had a lifting range up to 10 or 12 ft., with a few special models reaching to 16 ft.

Unusually compact, the new truck, pictured below, has increased speed and flexibility for maneuvering and lifting and lowering loads. Its new features of design and construction make the truck especially useful for high-tiering materials and merchandise. End-controlled, it permits maximum safety for the operator.

Two sections instead of the usual three are incorporated in the elevating system of the truck, identified as Model F 24 T. One pair of columns forms a primary frame 11 ft. above floor level. A second pair, virtually the same height, forms the telescoping frame.

Electrically driven, the model has three separate motors: one for traveling, one for operating the elevating mechanism, and the third for tilting the upright columns. Capacity is rated at 4,000 lb. for lifting to a height of 11 ft., and 3,000 lb. to 18 ft. The truck has a lifting speed of 13 ft. per min. with a capacity load, and a lowering speed of 20 ft. per min. Traveling speed is five miles an hour.

Independent of the uprights and fork, the body of the truck is only 7 ft. 8 in. long.



Tilting Deck Trailer Proves Successful Equipment Mover

ACCEPTED BY Southern California contractors as one of the best answers to moving equipment, a tilting deck trailer, manufactured by the Wright Trailer Co., Los Angeles, Calif., has been proven by a year of heavy duty service with no instance of structural defects.

Safety, low cost, and ease of loading are but a few of the advantages claimed by this new 25-ton capacity, 23-ft. trailer shown above. A D-8 tractor can be loaded in three minutes as there are no dangerous and heavy skids to place or remove. Initial cost of the trailer is comparable to that of any semi-trailer capable of moving equivalent loads. A standard dump truck can be used as a puller, having the dual purpose role of earth moving, then being immediately adaptable to pulling the trailer.

The tractor is in perfect balance, making coupling, driving, and loading easily handled by one man. The heavy duty trailer is versatile, since the 8-ft. x 23-ft. deck of 25 tons capacity makes possible the moving of practically all contractor's equipment.

Cushioned action on specially designed dual axle walking action, eliminates dangerous side sway. Moving is possible over all types of road conditions. Decks are of 2½-in. oak, and brake shoes 12 x 6 in. Other features include Kay Brunner axles, Budd wheels, vacuum or air brakes, breakaway safety valves, running lights, lashing rings, and safety chain.

Makeshift Snow Roller Found to Be Excellent Device at Ogden Airport

A UNIQUE method of compacting snow on the landing strips and aprons is being utilized at Hinckley Field, Ogden Municipal Airport, through the use of a makeshift roller. Brain-child of Art Mortensen, manager of Hinckley Field, and also owner and operator of the Utah-Pacific Airway operating out of the field, the roller was constructed several years ago in Ogden City Street Shops from a 36-in. galvanized culvert pipe and scrap found around the shop. Since that time it has worked remarkably well, according to all reports, and is declared a useful piece of equipmen

A 36-in. diameter corrugated culve pipe, 16 ft. long with welded joints wa used in the construction of the rolle pictured below. Struts made from strap cut from a 36-in. steel water pipe, heavil braced with angle steel were welded o the inside of the culvert pipe on 24-i centers. Steel plate covers were welde over each end of the pipe to which rolle bearings to hold the frame were at tached. The frame was built of 4-i channel steel, with two additional char nels and braces formed to make tongue. The weight of the machine approximately 4,000 lb. It is drawn by road patrol, light tractor or heavy truck

According to designer Mortensen, th roller will compact up to ten inches c snow much cheaper and more satisfac torily than would be its removal wit plows, and it does not leave a bank alon the runway for fresh snow to drift ove

Through the use of this roller, heav planes landing in the snow leave com paratively shallow ruts. DC-3's landin on one foot of snow compacted by thi roller, leave ruts of less than one inc in depth. A few days after a storm hit Ogden, the roller is hitched to a roa patrol with the blade set to partially cu the ruts. After one or two rollings, th runways are in perfect condition.

If a thaw occurs when there is a heav mat of snow, it is necessary to windro and remove it with a Sno-Go.

Triangulation

(Continued from page 92)

The triangulation party consists of 32 men and is divided as follows: three observing units, two building crews, lightkeepers, computers, and reconnaissance men. The reconnaissance men select the most suitable location for the new stations, bearing in mind the best system of triangles obtainable, the needs of the city or county engineer, the accessibility of the stations, and the safety of the marks from destruction. The accuracy of the work depends largely upon the shape of the triangles and the number of lines of sight clear of intervening objects, so the men must select stations that will give strong triangles, and must determine the height of signal required to give adequate clearance. The building parties set the marks at the stations and erect the signals. During observations, the lightkeepers center their lights over the station mark and show them to the observing parties at the next station. All communication between parties at night is done by signaling with the lights, using the Morse code. The lights are especially built for this use, enclosed in box frames, with special reflectors and bulbs designed to permit focusing.

The traverse stations in Alameda are marked with bronze traverse disks set in precast concrete posts. These are embedded under the sidewalk pavement, access being provided by small cast iron frames with lids. The marks are approximately 1,000 ft. apart, at street intersections to provide, where possible, visibility in four directions. Five triangulation stations are being established in Alameda to provide a connection between the triangulation and the traverse, and to control the traverse. Measurement of angles will be made with a small theodolite of high precision, and all distances will be measured with invar tapes that have been standardized by the U. S. Bureau of Standards. The tapes will be stretched with a set tension, and temperature readings will be taken so that corrections for expansion can be made. It is expected that the traverse, like the triangulation, will be accurate to 1 part in 100,000.

Overall adaptation

It is also interesting to note, that the state-wide mapping program now being done by the United States Geological Survey in cooperation with the State of California has been tied to this new triangulation scheme. In fact, many of the stations were established to fit the needs of the mapping program, and all of the new stations will appear on these maps.

This is the first time in the records of the United States Coast and Geodetic Survey that a project such as this one has been attempted and a great deal of credit should be given the officers of the Survey and the City and County Engineers who have made this project possible. Many individual cities in the United States, such as New York, Hartford, Rochester, Richmond, Cincinnati and others, have established triangulation schemes for control of city surveys, but never have a group of cities and counties cooperated upon a joint project of such magnitude as this one.

Work was officially started on the project Oct. 1, 1946 and on March 1, 1947, the project was 85 per cent com plete. All reconnaissance is complete, a of the triangulation and traverse sta tions have been constructed. Observa tions are complete on approximately 7 of the stations. Measurement of the tra verses in the City of Alameda is no being undertaken.

All field computations are being mai tained to keep pace with the field obse vations. All triangles are checked fo closure and the geodetic position com puted for each station. These are pre liminary only, as a check on the accurac of the field work. Upon completion th results of the survey will be forwarde to Washington where the measurement will be adjusted and the accurate posi tion of each station computed. All of th triangulation work is being done in ac cordance with the Specifications in th Survey's Manual of "First Order Tri angulation" Special Publication No. 12 The procedures for traverse measure ment conform to those outlined in th Manual of First Order Traverse S. P No. 137.

The final data of the survey will b published by the Coast and Geodeti Survey giving the Geodetic and Lam bert coordinates for each station. Th Lambert coordinates are a plane co ordinate system based upon the Lambe conformal projection established by th Coast and Geodetic Survey for Zone of the State of California.

A great deal of effort is being devote to this work by the members of the Sur vey and engineers in the cooperatin groups, and it is hoped that it may serv as the basis of similar work in man other parts of the United States.

NEWS OF WESTERN CONSTRUCTION

MARCH, 1947

Tieton Irrigation District First to Clear Bureau Debt

WITH ALL of the ceremony appropriate to the occasion the Tieton Irrigation District paid off the last installment of its debt to the Bureau of Reclamation and in turn received full title to the irrigation works which were constructed by the Bureau 37 years ago. As the first irrigation district to completely repay its construction costs, Tieton, and the Yakima Valley of Washington in which it is situated, took a full day to entertain guests from all over the United States.

Climax of the day's celebration was the presentation to J. A. Krug, Secretary of the Interior, of a check for $19,-631.98 representing the last installment of the $3,597,479 construction costs, by Clifford Kail, president of the irrigation district. Krug then presented Kail with a king-size certificate of title to the irrigation works in the presence of several thousand farmers of the district.

As master of ceremonies at the presentation, Rep. Hal Holmes (D., Wash.) pointed out that the Yakima irrigation project of which the Tieton district was a part, has produced $900,-000,000 worth of food products, a figure three times greater than the gold produced as a result of the Klondike strike in Alaska. In accepting the payment, and paying tribute to the irrigationists of the district, Krug stated it is his opinion that the federal income tax paid by farmers in the Tieton irrigation district probably exceeds the total expenditure of government funds in the project. He pointed out that now, as planned, the federal government was withdrawing from supervision of the project after having extended aid to the district.

In 1910 when the Bureau of Reclamation undertook construction of the irrigation works, the area of the Tieton district consisted of sage brush-covered hills and valleys with only a small acreage in Cowiche Creek bottoms under cultivation. The early construction was largely hand work, aided by horse teams. The machines now used in the construction of irrigation works were then still far in the future.

Now there are 21,500 ac. of land, largely in diversified orchards, under irrigation in the district. Operation of the irrigation works will continue under the direction of Guy C. Finley who was appointed manager for the district several months ago. Finley was an engineer with the Bureau of Reclamation in 1910 and was one of those who supervised the original construction of the Tieton project. He returns to the Tieton from the Seattle District, Corps of Engineers.

CLIFFORD KAIL, left, president of the Tieton Irrigation District, presents J. A. KRUG, secretary of the interior, with the check covering final payment of the construction performed by the Bureau of Reclamation 37 years ago. Tieton is the first irrigation district to complete repayment of construction costs.

Montana Power Co. Seeking Federal Approval to Expand

THE MONTANA Power Co. has applied to the Federal Power Commission for authority to construct additional facilities to increase the capacity of its hydroelectric project on Flathead Lake and River in Montana.

As outlined in its application, the company plans to extend the power house to accommodate new installation of a second generating unit with appurtenant equipment and to complete the pressure tunnel and intake structure for the second unit.

The proposed changes are necessary, the company stated, because the growth of its load is such that additional capacity will soon be required and the additional capacity will permit much greater flexibility in the operation of the plant, thus resulting in a more efficient utilization of the energy available.

The present installed capacity of the plant is 77,000 hp.

Dredge to Channel Silt at Needles

BIDS HAVE BEEN called for the construction of a huge dredge which will be used to provide new channel sections for the Colorado River below Hoover Dam, it has been announced by Regional Director E. A. Moritz of the Bureau of Reclamation at Boulder City, Nev.

The regulated, relatively silt-free flow of the once turbulent and muddy stream following the construction of the dam, has changed the gradient of the river's bed to add to silt control problems at Needles, Calif., and other points on the river. These silt problems will be alleviated by dredging new channel sections.

The first work to be undertaken is on a 12-mi. section of the river between Needles and Topock. In this section a silt plug has raised the river bed several feet during the past few years causing the river to spread out over a large area endangering the low-lying areas of Needles and the railroad which crosses at Topock and runs parallel to the river at Needles. The dredge will excavate a new channel in this section. It is estimated that it will be at least one year before the equipment will be ready for operation. Similar work will be done in the Cibola Valley further down the river and in other areas.

The specifications call for the construction and assembly at Needles of the dredge, fuel, work and pipe barges and a dredge-tender work boat. Prospective

contractors will design the equipment within the limitations set forth so that it will be capable of accomplishing the work as outlined in the specifications. The dredge must be about 40 ft. wide and from 120 to 140 ft. long with a draft of not more than six feet.

Design features of the dredge and other equipment must enable them to operate in the dense jungle of tules, willows and other vegetation which has grown on the silt deposits in the river. One cutter must be capable of cutting through dense growth of tules, willows and roots; a second cutter is designed for operation in sand and clay or gumbo.

Surveys have been under way for the past year along the various silt plugs in the river to determine necessary corrective measures. As the surveys progressed it became evident that dredging would be necessary. It has been determined that the new channels will have to be about 250 ft. wide and approximately 15 to 17 ft. deep to take care of a flow of 40,000 sec. ft.

After the work is completed in the Needles area, the equipment will be moved to the Cibola Valley or some other area for further work. The new channel in the Cibola will probably have to be about 12 mi. long also. The equipment will be designed so that it can be disassembled for movement since dams on the river make it impossible to move it up and down the river.

Bureau Reports on Rehabilitation Of Fort Sumner Irrigation Project

A BUREAU of Reclamation report on a plan for the rehabilitation of the Fort Sumner irrigation project, an irrigation enterprise on the Pecos River, near Fort Sumner, New Mexico, was issued recently.

The report points out that irrigation was first initiated in the area in 1863, and has been practiced continuously since 1903. The present Fort Sumner Irrigation District was organized in 1919. In recent years about 5,000 ac. have been under irrigation out of a total of about 8,000 ac. of farm lands in the district.

Repeated failures of the diversion dams and consequent financial difficulties have hampered the development of the area, the report continues. The existing diversion dam is in a precarious condition resulting from flood damages, and the canals, laterals and drains, as well as general farm improvements have been allowed to deteriorate because the land owners fear that new floods would again destroy their investments.

The project planned would protect the existing development against further financial loss due to failure of the dam and would provide sustained irrigation for 6,500 ac. of land in the district. The principal features of the plan include construction of a new concrete diversion dam, on a firm foundation, to replace the present damaged structure, rehabilitation and enlargement of the canal and drainage systems, and installation of an adequate pumping plant to deliver water to the high-line canal.

The report terms the project feasible from an engineering standpoint, and economically justified on the basis of present costs and estimated average irrigation benefits. The ratio of benefits to costs is given as 2.38 to 1.

Estimated construction cost of the project, based on 1946 prices, is $1,798,000. Water users would be able to repay $1,040,000 of the estimated construction cost over a period of 40 years. If the period were extended, the water users would be able to repay the total cost of the project in 69 years, which the report considers well within the useful life of the project. The water users have expressed their willingness to continue annual payments beyond the normal 40-year period, and have urged immediate construction.

COLUMBIA STEEL COMPANY EXPANDS DOCK FACILITIES AT PITTSBURG

WORK is progressing rapidly on a 600-ft. concrete dock, which, when completed, will make industrial Pittsburg, Calif., located 40 mi. east of San Francisco, a deep-water port. Part of a $25,000,000 expansion of Columbia Steel Co.'s Pittsburg plant, it will provide ship-to-rail facilities for the company's products.

Reclamation Engineers Dismissed From Jobs

DISMISSAL OF TWO Bureau of Reclamation engineers and disciplinary actions involving several other employees of the Colorado-Big Thompson project in northern Colorado have been announced by Secretary of the Interior Krug.

The actions were taken as a result of investigations begun by the Department of the Interior in 1945 into allegations that project employees were lax in administrative supervision and derelict of duty in connection with construction of the project.

The Secretary announced outright dismissal of Earl R. Stuver, an engineer who had been in direct charge of important phases of the project. He said that one of Stuver's subordinates had also been dismissed, but withheld announcing his name pending final action on a request for reconsideration which the employee had filed. A third employee has been suspended from duty pending further investigations, and four minor project employees have been reprimanded.

C. H. Howell of Estes Park, Colo., the project superintendent, was temporarily suspended but has since been restored to full duty in his previous capacity.

The investigations were initiated on recommendation of Commissioner Harry W. Bashore, who has since retired, and were approved by the present Commissioner, Michael W. Straus, while the latter was Assistant Secretary of the Interior.

Secretary Krug said that further investigations are under way to ascertain whether the possible failure of the employees involved to enforce full compliance by contractors with Government specifications for construction of project features may have resulted in any loss to the Government.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—Stripped of all bi-issues, the deep fundamental conflict between the Department of Interior and the House Appropriations Committee, as well as other Congressional Committees, is the same issue which is growing so swiftly in the awareness of the people everywhere: centralization of the controlling functions of Government, as opposed to re-establishment of the historic practice of independent action in states, cities and other communities. It inevitably and clearly comes down to a condition in which the people will be subordinate to the over-all State, or the over-all State will be subordinate to the people.

Don't make the mistake of thinking that those who believe in the subordination of the people to the State are insincere; they utterly believe in their doctrine. And they think it is best for the vastly greater number, not only in this country but everywhere else in the world. They believe that levelling some of us down to average ways of living, and average standards, will lift infinitely more of us, globally, to higher standards of comfort and culture than has ever been seen in this world. Their insincerity lies in the way they are trying to slip their ideology over on the rest of us. They work like moles, and they change practices almost imperceptibly. Only recently has the effect of the doctrine of some bureaucrats, as it is actively and realistically applied, become sharply clear.

Committee procedure

The Congressional Committees have tightened up in their proceedings. There is an entirely new system on the Hill. Those who have been called to testify at the hearings of the Joint Appropriations Committee, for instance, find they are summoned into an executive session from which everybody is excluded except the Committee Members and the witness. Moreover, (and this is what is novel), the Committee usually asks the witness to make his statement, and then dismisses him courteously without asking a single question. The questions in a hearing normally produce the meat of the testimony. The lack of questions has had the effect of confusing and bewildering the witnesses. They feel as though they had been punching a featherbed. And usually they reach the conclusion that their testimony has had little effect on the Committee, that the Committee is merely going through an unavoidable formality, and that it has already made up its mind.

You can get the drift of what is in the Committee mind by what happened when the people from Reclamation presented their facts and figures. They were asked to present in detail the figures of their carry-overs. The Committee then commented significantly that the Reclamation Bureau could scarcely expect the Congress to approve of any expansion of expenditures since the President, whom the executive agency of the Interior certainly represented, had sharply curtailed its fiscal program, in relation to the funds allocated to the Department, when he ordered drastic cuts and freezes last year.

The suggested appropriations for Reclamation, Flood Control, Rivers and Harbors, and other public works of interest to the West, come at the very bottom of the list in the budget. It is only reasonable, when you contemplate what the Committee is doing to the national defense or national security appropriations, to feel that the public works budget will be still more drastically cut. Responsible representatives of the organizations looking after various public works, such as reclamation and flood control, feel the cuts will be at least 25 per cent, and possibly much deeper; they even seriously fear that some categories of the public works budget may be dropped entirely.

They base this fear upon the fact that the budget, as adopted by the Joint Committee, has an over-all ceiling, and that the Committee will stubbornly insist that no appropriations be made that will exceed the over-all ceiling.

All but my project!

The people who come here from the West have without exception insisted that the budget must be cut, deeply; they have hammered on the economy motif everlastingly. But they always insist that their particular project is the exception that should not be cut. Obviously, this inconsistency hurts their cause; and patently the Congress is more impressed by the over-all nation-wide demand for economy than it is by the myriads of appeals for local help.

This situation confronted Gov. Warren and State Engineer Ed Hyatt, of California, when they came here to ask for the appropriation for the Central Valley, estimates of which run all the way from $20,000,000 to $59,000,000. They were asked why they did not use the cash balance they have in their State treasury. It was pointed out that almost all states, as a result of the war, are unusually prosperous, with surplus funds at record levels. Among the 28 states reporting, it was pointed out that New York came first with $501,000,000 in general, highway, and postwar reserve funds; and California, second, with $491,000,000. Note, also, the figures reveal, the 28 states reporting show an accumulation of $2,207,000,000, while the gross indebtedness of all states is roughly $2,357,000,000. An over-all estimate for the States of the Union is reported by the Daily Bond Buyer as showing that State income, approved by the voters everywhere, exceeds gross indebtedness by 55%.

State funds—State rights

This naturally leads to the thought that the States, in regional groups, such as the states of the Pacific Northwest (just as an illustration), might work out an economic formula, subordinating the political aspect almost entirely, to build a project, such as the Columbia River enterprise, purely as a joint-state regional undertaking. Congressman Carl T. Curtis, Nebraska, has actually almost completed such a formula. It would make the states the bosses of the joint project, with the Federal Government contributing only that proportion of the funds which should realistically be the responsibility of all the people of the United States. The plan has actually worked among three states of the Southwest, including Oklahoma; they have a joint state arrangement which handles the business and fiscal affairs of joint state oil problems. For a number of years they have used this joint budget, and have appointed, in rotation, joint managers or directors to administer the joint business collectively.

Obviously, the Federal agencies will bristle with opposition as this idea expands and spreads. It would revive the rights of the states and the communities, as well as the citizens, to administer affairs which have gradually been taken over by the Federal agencies. In other words, it would restore the democracy to which this country is politically dedicated.

It is no secret that the war which has been going on behind closed doors of the hearings of the subcommittee of the House Appropriations Committee involves the determination of Congressman Robert Jones of Ohio to slash the construction program of the Reclamation Bureau, which wants funds for development of Columbia River power. Jones is opposed to the project because he distrusts the present leadership in the agency, and particularly is opposed to the Bonneville Administrator Raver. Raver is reported to have been so definitely stubborn about giving the Committee information and data that Congressman Stockman of Oregon demanded that Interior Secretary Krug dismiss Raver. Krug, belonging to the same ideological school to which Raver belongs, promptly defended his subordinate. This has precipitated a fight which logically will not help the cause of appropriations.

Incidentally, the group of public and private power champions who came here to fight for the Columbia River funds estimated that the region needs an additional 1,565,000 kw. of power installed by 1953, plus necessary transmission lines. They want the transmission funds to be made available to Bonneville on an annual and continuing basis, so that business men and investors will have a firm picture of what they could depend on through 1953. They don't want a Federally controlled Columbia Valley Au-

thority. It is almost certain Bonneville will get some funds; but it also is certain the amount will be moderate.

Power socialism

There is unity in this picture when you realize that most of the hostility springs from a conviction of some Members of Congress that the whole Federal power program, largely centering in the Reclamation Bureau, is tinged with long range Socialism. Whatever money is supplied, will undoubtedly be "all boundround with a woolen string" of restrictions against Federal centralization.

The opposition to the Reclamation Bureau's power program has been forcibly expressed in several bills introduced in the Senate as well as the House. The most comprehensive one, originally discussed by the National Reclamation Association, is S. 539 in the Senate, and H. R. 1886 in the House. Sen. Butler, Nebr., and Congressman Rockwell, Colo., sponsored it. If adopted it will drastically revise the Reclamation Act of 1939, virtually amounting to repeal. It would require specific Congressional authorization for all new reclamation projects, or even new developments in connection with existing projects. It particularly clarifies the intent of Congress on hydro financing, and would make power carry more of the repayment load on Reclamation construction projects. In other words, it would wipe out the peremptory directive powers of the Secretary of the Interior, and would definitely check the march towards centralization, so far as public power in the Department of Interior is concerned.

The issue has been stated thus: if the area sites for small local irrigation projects with relatively higher cost for incidental power are not protected from cheap wholesale Federal power supplied by transmission lines from a few large but remote Federal projects, the smaller projects will not be built. This would make the Reclamation Bureau a ballooning adventure in power, growing and growing as a power empire, while it would become less and less an irrigation agency. This is believed by Congressmen to be the present policy of the Interior Department, while the Western people are reported to be against it.

The bill also requires that rates be fixed at competitive levels so as to reflect the true cost of the most efficient method of generation. Rates would be set at levels comparable with nearby utilities; and long-distance transmission lines, originating at other Federal projects, would be kept from bringing cheap power to the area of other projects. There would be revision of the repayment provisions of costs allocated to power, with complete amortization of the power features within 67 years, with annual interest rates at 2%.

Other reclamation bills

Congressman West, Tex., introduced H. R. 2052 which would exempt Central Valley, the San Luis Valley of Colorado, and the Valley Gravity Canal of Texas, from the land-limitation provisions of the Federal reclamation laws, thus wiping out the 160-ac. limitation which Messrs. Straus, Krug, and others insist must govern the distribution of water to Western reclaimed lands.

Congressman Welch, Calif., has introduced H. R. 1556, which would give the Bureau of Reclamation added authority to propagandize its activities, even authorizing the use of recordings, apparently designed for widespread use on the radio. Per contra, the Senate Civil Service Committee quizzed the public relations director of the Department of Interior in regard to the need for the magazine, issued by the Bureau, called Reclamation Era. The Senators took exception to a "cheesecake" picture cover, showing three bathing beauties as an adjunct to the virtues of reclamation under the direction of the Bureau. The public relations director testified that the general supervisorial division of the Department had nothing to do with the magazine, and that he knew nothing about it; which naturally caused much criticism among the Senators.

Another bill was introduced authorizing the construction of Bridge Canyon dam on the Colorado, to cost, roughly, $260,000,000. At another hearing the San Diego Metropolitan Aqueduct came up for discussion, to cost $13,000,000. It was reported the work had been 65 per cent completed, and that unless the rest was finished, San Diego would be out of water by the end of 1947. The Navy uses 46 per cent of the water.

Sen. George W. Malone, Nev., who has been outspokenly critical of the huge appropriations for TVA and similar corporations, and who is set to recapture for the Western States some of the control they have lost to the Federal Government over their public resources, has been made chairman of a special committee to investigate the factors affecting reclamation, minerals, fuels, and forestry, and their products. The investigation of the Malone Committee will cover the broadest field of inquiry launched by any Committee set up under the new Congressional Reorganization Act. Likely the first inquiry will have to do with sugar, especially Western sugar growers and industry.

Westerners on committees

Western Members of Congress are now on the following committees: Sen. Cordon, Ore., on subcommittee for Interior Appropriations; the subcommittee for Appropriations for the War Department; and on the Public Lands Committee. Sen. Knowland, Calif., is on the Appropriations Committee. Sen. Dworshak, Ida., on the Appropriations Committee; the Public Lands Committee; and the Mines and Mining Committee. Sen. Hayden, Ariz., on the Appropriations Committee. Sen. O'Mahoney, Wyo., on the Appropriations Committee and the Irrigation and Reclamation Committee. Sen. McCarran, Nev., on the Appropriations Committee. Sen. Robertson, Wyo., on the Public Lands Committee. Sen. Downey, Calif., on the Public Lands Committee and Mines and Mining Committee. Sen. McFarland, Ariz., on the Public Lands Committee. Sen. Millikin, Colo., on the Irrigation and Reclamation Committee, and the Mines and Mining Committee Sen. Watkins, Utah, on the Irrigation and Reclamation Committee, and on the Indian Affairs Committee. Sen. Ecton Mont., on the Irrigation and Reclamation Committee, and the Indian Affairs Committee. Sen. Hatch, N. Mex., on the Irrigation and Reclamation Committee and the Indian Affairs Committee. Sen Malone, Nev., on the Mines and Mining Committee, and the Indian Affairs Committee. Sen. Murray, Mont., on the Mines and Mining Committee, and the Indian Affairs Committee.

Westerners on the House Public Lands Committee are: Congressmen Russell, Nev.; Sanborn, Ida.; Dawson Utah; Engle, Calif.; Farrington, Hawaii; Bartlett, Alaska; Barrett, Wyo.; Rockwell, Colo.; D'Ewart, Mont.; Poulson, Calif.; Murdock, Ariz.; Carroll Colo.; Fernandez, N. Mex. On the House Committee on Public Works: Congressmen Angell, Ore.; Norman Wash.; McDonough, Calif.; and Elliott Calif.

Miscellaneous

Sen. Hawkes, N. J., introduced Senate Joint Resolution 45 legally changing the name of Boulder Dam to Hoover Dam. The resolution may be enacted, but it is the general opinion in the Congress that it should not require action, because the original legal designation of the dam as Hoover Dam has never been officially changed. It is held that Ickes' action was without authority, and was an arbitrary assumption of power he did not have.

The 37th convention of the National Rivers and Harbors Congress has been called in Washington, D. C., on May 2nd and 3rd.

Alaska is to be one of the next new fields for large public power development if the Bureau of Reclamation can persuade Congress to put over H. R. 2180 which was introduced late in February by Congressman Welch of California. The hope is that the idea will appeal strongly to the press of the nation which urgently needs pulp for newsprint. Cheap power is supposed to be the solution to the problem of making pulp in Alaska, long a puzzle to those who were aware that the Territory has plenty of wood, but that it has been almost impossible to lick the problem of bringing it out at a cost that would make it an economic feasibility. There is no immediate prospect of adoption of the bill, under present Congressional wariness about spending more money.

Congressman Lemke introduced H. R. 1977 for the Bureau of Reclamation in rebuttal of H. R. 1886, the Rockwell bill, which is designed to clamp down on Reclamation's invasion of Congressional authority. The Lemke bill would double copper-rivet the authority of the Secretary of the Interior to authorize Reclamation projects without Congressional approval, and would make it possible for power facilities of Reclamation projects to pay almost negligible interest, and to delay completing of payments for almost three-quarters of a century or longer. At present theoretically they pay 3 per cent, and are supposed to pay out complete liquidation in 50 years.

Congressional Authorization Sought To Develop Central Arizona Project

A REPORT released by E. A. Moritz, Director of Region III of the Bureau of Reclamation, states that either the Bridge Canyon or Parker Route alternatives of the Central Arizona project could be built by established construction methods. However, special Congressional authorization would be required for Federal construction of the project since the project would not be self-liquidating within the provisions of the Reclamation Laws.

The report makes the following recommendation:

"It is recommended that detailed study of the Central Arizona Project be concentrated on the plan employing the Parker Route."

The report estimates that, on the basis of 1946 cost levels, the Bridge Canyon Route alternative would require $1,011,000,000 to build and the Parker Route alternative $605,000,000.

Sen. E. W. McFarland of Arizona has introduced a bill in Congress to authorize construction of the Central Arizona Project which incorporates several departures from the existing Reclamation Law. The repayment period for irrigation costs would be increased from 40 to 80 years and the interest rate for construction costs charged to power would be reduced from 3 to 2 per cent. It provides also for non-reimbursable allocations to silt control, recreation, and river regulation. Present Reclamation Law does not authorize non-reimbursable allocations to these items.

The report discusses the power output of the two routes, pointing out that more power would be available for commercial sale under the Bridge Canyon Route than under the Parker Route. More power would be generated under the Parker Route, but a large block of energy would be required under this route to pump water from Havasu Lake. The report points out that the net difference in power available for commercial sale amounts to approximately five per cent of the output of the potential Bridge Canyon power plant.

Another factor to which the report calls attention is the length of time required for construction under the two alternatives. It shows that approximately 10 years would be required for construction of the Bridge Canyon Route, as compared to only five years for the Parker Route.

Investigation of the Central Arizona Project, one of the largest federal reclamation projects ever considered, has been conducted by the Bureau of Reclamation in cooperation with the State of Arizona under an agreement executed July 31, 1944. The project's primary purpose would be to transport water from the Colorado River to central Arizona to establish an adequate and more dependable irrigation water supply for a major portion of the developed farm lands located in the Salt River Valley, the middle Gila River flood plain, the Santa Cruz River flood plain, along the upper San Pedro River, and along the upper Gila River in eastern Arizona and western New Mexico.

A more adequate municipal water supply for the city of Tucson is also included in the plan of development.

The three routes to which study was devoted, follow:

MARBLE CANYON ROUTE, under which Colorado River water would be diverted through a 143-mi. tunnel from a potential dam at Marble Canyon to the Verde River, with several power and regulatory dams considered for construction on the Verde River. This route would deliver water to a storage dam which would be constructed at the McDowell site, immediately below the confluence of the Salt and Verde Rivers.

THE BRIDGE CANYON ROUTE, under which Colorado River water would be diverted through a 77-mi. tunnel from a reservoir to be created by Bridge Canyon Dam, at the head of Lake Mead, southward to the Big Sandy River where it would connect to an aqueduct. The water will be carried by gravity through the aqueduct to the potential McDowell Dam.

THE PARKER ROUTE, under which the water would be pumped from Havasu Lake on the Colorado River. Four pumping stations spaced at irregular intervals along the west end of a 235-mi. aqueduct would raise the water 985 ft. to pass the high point on the line at Harquahala Pass, from which point it would flow by gravity to a point near McDowell Dam.

The distribution system to transport the water to the lands would be identical under either of the three diversion plans and the same lands would be served.

In September, 1945, the Marble Canyon Route was eliminated from further study. The Bureau has since been making engineering and economic studies of the Bridge Canyon and Parker routes.

Cooperative studies by the Groundwater Division of the Geological Survey, the State of Arizona, and the Bureau of Reclamation show that the current rate of pumping from underground storage is more than twice the normal recharge to such storage. Unless some new source of water can be developed, a serious and permanent impairment of the area's agriculture, induced by water shortages, will result.

The purpose of the Central Arizona Project, the report states, would be to substitute Colorado River water for groundwater now obtained by overdraft, and thus protect established agricultural lands against eventual water shortage, as well as to furnish supplemental water to lands which do not now receive a full supply.

The report is based upon an annual diversion from the Colorado River in the amount of 1,200,000 ac. ft. per year. In addition, 132,000 ac. ft. of new water would be developed by increased reservoir capacity on the Gila River and its tributaries.

In comparing the two alternatives on various essential points, the report shows the Parker Route to hold the advantage in almost every respect. It was found that water could be delivered to the project area at a lower cost under the Parker Route regardless of the length of the repayment period considered.

Prefab Units to China For Canada Ambassador

PREFABRICATED houses built in Vancouver, B. C. are now being shipped to China to be used as dwellings and offices for Hon. T. C. Davis, new Canadian ambassador to China, and members of his staff. C. B. K. Van Norman, Vancouver architect, and head of Precision Housing Co., states his company has shipped four units, each of which are two-story buildings containing four bedrooms. Two of the units have a floor area of 21 x 70 ft. and two have an area of 21 x 60 ft. All have complete facilities including bathroom and kitchen fixtures, electrical wiring and switches, ready to assemble with the houses at their destination, so that the occupants can move in as soon as the buildings are erected.

The ambassador explained in Ottawa that he has no intention of having himself or his staff homeless. The housing situation in Nanking, the Chinese capital, is "as tough as in Washington or Ottawa," he pointed out.

The prefabricated houses will be transported up the Yangtse-Kiang River to Nanking in an ex-American landing craft.

The four houses are designed to provide a chancery or embassy business office, together with accommodation for the first secretary and embassy workers. Judge Davis will move into the Canadian embassy proper which is presently overcrowded with offices, as well as with residential accommodations.

Price Too High Now for Nueces Basin Project

THE BUREAU of Reclamation has recommended against seeking Congressional authorization at this time for reclamation development of the Nueces River Basin and the adjacent Baffins Bay coastal area in Texas.

The recommendation made by Commissioner of Reclamation Straus pointed out that under present high construction costs, the farmers in the Basin would be able to repay only a very small portion of the project costs chargeable to irrigation. Also, engineers could find no practical means of providing irrigation water for the Baffins Bay area.

The Commissioner stated that the cost of a Nueces Basin project at 1946 prices would be $81,500,000. This is 64 per cent

greater than the $49,559,000 the project would have cost at 1940 prices.

A report, outlining a potential plan for developing the resources of the Nueces Basin, was prepared by Director Wesley R. Nelson, of the Bureau of Reclamation's Region V in Amarillo, Texas. It provided for the construction of six multiple-purpose reservoirs which would store sufficient water to irrigate 63,470 ac. of new lands and replace the water supply of 7,530 ac. of land now irrigated by ground-water pumping. Because of lack of head and low water yields, it would not be feasible to provide for the generation of hydroelectric power at any of the dams.

The report has been forwarded to the Governor of Texas and the Secretary of War for comments.

Construction Caravan Heads For Anchorage Headquarters

BIRCH-JOHNSON-LYTLE Construction Co. sent a 14-vehicle caravan from their Seattle headquarters to job headquarters at Anchorage, Alaska, via the Alcan highway last month as an experiment to determine whether it would be feasible to transport a number of vehicles by that means rather than by shipping, which has been a rather uncertain means of transportation since the contractor set up the Army job last summer. The caravan consisted of automobiles and busses, and was expected to reach Anchorage about two weeks after leaving Seattle. If the trip proves successful, the contractor plans to send trucks and other wheeled vehicles to the job by that means. Heavy construction equipment will not be taken up over the highway, however. The first caravan was under the supervision of Lowell Cook, foreman for the company.

Oregon Bill Assures New Dam Construction

PASSAGE OVER Oregon Gov. Earl Snell's veto of a measure to assure private power companies possession of their sites for the duration of license virtually assures construction of a dam on the Snake River in Eastern Oregon by the Idaho Power Co., C. J. Strike, president of the concern, said in Boise.

Previously Idaho Power officials had expressed concern over the then-existent law which permitted cities or the state to take over power plant sites upon two years' notice, merely through the payment of net investment and severance damages.

Learning of the Oregon legislature's action in overriding a gubernatorial veto for the first time in 10 years, Strike commented in Boise:

"It is our purpose, in building a power plant in Oregon, to fill growing needs of our customers in a wide area for an adequate and reliable supply of electricity. We could not proceed under the former law, which permitted condemnation of a power plant upon two years' notice, because it is impossible to design and construct another plant to replace it within that length of time.

"The present act of the Oregon legislature will give reasonable protection during the license period while at the same time, both state and federal agencies have full regulatory control of the company's activities. The act merely brings Oregon law into conformity with the existing federal licensing regulations."

Localizers to Be Installed At Mountain State Airports

LOCALIZERS, used to direct airplane pilots in landing, will be installed at the several mountain states airports, as a part of a nation-wide program. The announcement is made by T. P. Wright, administrator of the Civil Aeronautics Administration.

Localizers, guide paths, approach lights, compass locators, and glide paths will be installed at Helena, Mont., Miles City, Mont., Pueblo, Colo., Rock Springs, Wyo., Billings, Mont., Cheyenne, Wyo., Lewistown, Mont., Missoula, Mont., and Denver, Colo.

OBITUARIES . . .

Henry F. Blood, 63, consulting structural engineer of Portland, died Jan. 25. Particularly noted for the accuracy of his work and the conscientiousness with which he undertook each project, Blood had practiced in Portland since 1912 when he became structural engineer in the office of the city building inspector. During World War I he was with the Northwest Steel Co., and after the wa he and the late A. H. T. Williams se up the partnership of Blood and Wil liams. He designed the bridges for th Mt. Hood railway, was consultant o the design of the fishways for Bonne ville dam, and was associated with th design of many Northwest buildings.

* * *

Roy L. May, chief engineer and secre tary of the Tulare Lake Basin Wate Storage District, and secretary and di rector of the San Joaquin Valley Floo Control Association, died unexpectedl at his Hanford, Calif., home January 1 1947. May was active in the cause o California water resources control an development, and was known through out the state for his work in this field.

* * *

Scott Burton, 37, engineer with th Corps of Engineers at Fort Randall, S Dak., was killed in an automobile acci dent Jan. 25. He was a member of th first survey crew on the preconstructio survey at Fort Peck dam in Montana i 1933, leaving there in 1935 to work o Denison dam in Texas.

* * *

David E. Ball, 49, superintendent o the Yakima irrigation project for th Bureau of Reclamation, died in Yakima Wash., Feb. 23. He had been with th Bureau of Reclamation in the Yakim Valley since 1920.

* * *

Russell M. Baker, retired buildin contractor, died recently at his home i Los Angeles. He was 71 years of age.

Parran Issues Regulations Governing Federal-State Hospital Construction

REGULATIONS governing the nationwide Federal-State hospital construction program were issued recently by Surgeon General Thomas Parran of the United States Public Health Service. The program was created by the Hospital Survey and Construction Act, enacted last year.

The Act permits appropriations up to $3,000,000 to assist states in surveying and planning their hospital needs, and $75,000,000 annually for the next five years to assist in the construction of hospitals and health centers. For administration and surveys $2,350,000 has been appropriated. No construction money has yet been appropriated, but funds for this purpose will be requested at the present session of Congress.

The newly issued regulations cover type, size and distribution of hospitals; priority to be given to projects; general standards of construction and equipment; and State administration methods.

The number of public health centers is not to exceed one for each 30,000 population, except in states with fewer than 12 persons per sq. mi., where the numbe of centers is not to be more than one fo each 20,000 population. Each state ha the authority to distribute these center to conform to its individual organizatio of local health units.

Since the goal of the program is t provide hospitals where they are mos needed, construction funds will b granted according to priorities indicate by each state in its over-all constructio plan. The regulations, however, establis principles to be followed in determinin the priority to be given hospital projects The law provides for the granting o priorities to general hospitals in rura areas and in localities where populatio groups are less adequately served. Public Health Centers in rural areas also wil receive preference.

Standards of construction and equipment which the regulations establish include minimum requirements necessary to insure properly planned and well constructed hospital buildings. The standards relate to choice of site, type of architecture, construction, sanitation and general building regulations.

PERSONALLY SPEAKING

Colonel A. T. W. Moore, formerly with ıe Office of the Chief of Engineers, Washgton, D. C., was recently appointed Disict Engineer, Los Angeles District, Corps Engineers. Moore has been attached to ıe engineers since his graduation from Vest Point in 1918, and commanded the)th Engineer Combat Regiment in the unisian campaign of World War II. pon completion of the campaign, he beıme Chief Engineer of Services of Supply, orth African Theater of Operations, until ıly, 1944. Since that date he has served at amp Claiborne, La., and the Office, Chief Engineers, Washington, D. C.

* * *

Thirty-two civil engineers have been ranted professional engineers licenses by ıe Washington state board of engineering xaminers following examinations which ere held in Olympia during December. ngineers from Seattle granted licenses inlude **T. Bjornstad, W. P. Collier, V. H.)onaldson, D. H. Haines, P. B. Lutz, T.). McCarthy, C. McClure, E. B. Nelson, I. E. Roller, G. T. Sparrow,** and **H. O. Vestby.** Newly registered engineers from pokane include **P. G. Holgren, E. M. Hoyt, K. P. Norrie, C. E. Peterson,** and **W. C. Ross.** From Olympia **C. R. Cysewski,). E. Stein, P. Yeager,** and **B. Tremper** ere granted licenses, and from Tacoma **H. J. Whitacre** and **E. E. White.** Other Washington engineers include **O. H. Lang,** Richland; **W. J. Murphy,** Aberdeen; **S. H. Sandvos,** Bellevue; **H. M. Taylor,** Okaogan; **A. G. Ward,** Shelton; **J. H. White,** Coulee Dam; and **S. D. Eason,** Ephrata.

* * *

Samuel B. S. Nelson was selected reently for the position of engineer of conruction with the Los Angeles Department f Water & Power. He succeeds to the post ormerly held by **Captain H. L. Jacques,** etired, and will report to **Burton S. Grant,** ssistant chief engineer of water works. He ill be in charge of the construction of all ams, major pipelines, buildings, pumping nd water treatment plants, tunnels and ther major projects. He will also direct he inspection of work done for the water ystem by private contractors. Nelson has een with the department since 1926, and revious to this time had been employed in he field engineering division.

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E. L. Stockton, former assistant conruction engineer in the New Mexico State Highway Department, moves to Albuuerque as district engineer in charge of he Third Highway District comprising five ounties, it was announced recently by Burton Dwyre, State Highway Engineer. Stockton succeeds **W. R. Eccles,** who has een named safety and traffic engineer with eadquarters in Santa Fe. Another change oncerns **Fred G. Healy,** construction engieer, who will be given a special assignent as urban engineer in charge of adance engineering studies and urban surveys in connection with urban highway rojects. The post vacated by Healy will e taken by **C. G. Grosvenor,** veteran engieer of the Fifth District headquartered in Santa Fe. Grosvenor's old job is to be filled y **C. M. Johnstone. L. D. Wilson,** office ngineer in the state headquarters office, vas named administration engineer.

KENNETH F. VERNON, assistant regional director for the Bureau of Reclamation at Billings, Mont., will become director on March 31, upon the retirement of H. D. COMSTOCK. Vernon has been with the Bureau for 13 years, being employed on the Central Valley project in California until recently.

Finch Van Slyke has been appointed county road engineer of Pierce County, Washington, succeeding **Lester M. Corey.** Van Slyke has been employed in the county engineer's office for the past 24 years, serving as field engineer until his recent appointment. Corey, who has also been with the department for 24 years, had been county engineer since 1934. He expects to relace Van Slyke as field engineer.

* * *

Charles B. Donaldson, recently appointed district airport engineer for the Civil Aeronautics Administration in Nevada, arrived in Carson City in January to assume his new duties. **William M. Howard,** who has been acting CAA engineer, will remain at the Carson City office as his assistant. Donaldson has had eleven years' experience in the Washington, D. C., offices of the CAA.

* * *

Eleven professional engineers and three land surveyors have recently been granted licenses by the Oregon state board of engineering examiners. Those granted professional engineers certificates include **Kurt H. Siecke,** Portland; **Edward S. Clemmons,** Portland; **Warren G. Tilton,** Portland; **Charles H. Strong,** Eugene; **Merrill H. Ward,** Valsetz; **Max R. Crosby,** Vida; **C. Gordon DeSwarte,** Los Angeles, Calif.; **Elon E. Ellis,** Seattle, Wash.; **Laurence M. Smith,** Spokane, Wash.; **John J. McInery,** Walla Walla, Wash.; and **Frederick H. Meyers,** Cincinnati, Ohio. Those granted land surveyor certificates include **Lyle E. Beyers, Arthur Duffy,** and **W. V. Gredvig,** all of Portland.

* * *

Fredrik N. Cronholm has taken a six months' leave of absence from the U. S. Army Engineers, during which time he will be employed by Morrison-Knudsen Co., Inc., in the capacity of chief engineer of a company group working abroad. Cronholm will make a study of land and water resources in the Near East for the company. He expects to return to the Salt Lake City office of the U. S. E. D. in June.

Warren C. Estes, one-time assistant chief estimator with Bechtel-McCone-Parsons and now with C. L. Peck, and **George Terry,** at present also with Peck, have formed their own enterprise, the E & T Construction Company, located in Southern California. Estes was a PT boat captain with the navy during the war. Terry was formerly superintendent on the Alcan Highway and a traveling superintendent for Sears Roebuck. The partners will specialize in industrial and commercial construction.

* * *

E. B. Stahm, former assistant director of planning for San Diego, arrived in San Mateo, Calif., recently to assume his new job of city planning engineer. One of the first problems to be tackled by Stahm will be drafting of a master street plan and a detailed survey of the city's off-street parking problem.

* * *

Rowland M. Jones, Douglas County, Wash., engineer for the past two years, has resigned that position to become county engineer for Kittitas County with headquarters at Ellensburg. He succeeds **Don E. Akins** who resigned last month.

* * *

Tim de Jong, county engineer of Clatsop County, Oregon, before the war, has been reappointed to that position succeeding **Arthur Danielson.** During the war, de Jong served in the Civil Engineer Corps of the Navy.

* * *

Pacific Pipeline Construction Co. and Engineers, Ltd., have formed a partnership for conducting a general pipeline construction business under the name Pacific Pipeline & Engineers, Ltd. The new partnership brings together all of the facilities of two leading pipeline constructors in the west.

* * *

E. D. Alexander, senior civil engineer in the office of the Seattle city engineer, retired on March 1, after 41 years of service in the department. The city Board of Public Works at a recent meeting adopted a resolution commending Alexander for his long service to the city.

* * *

L. J. "Larry" Dolan is now engineer in charge of construction for the Bureau of Reclamation's project at Horsetooth Reservoir, Fort Collins, Colo. Dolan was formerly engineer on Mirage Flats Irrigation project in Nebraska and Post Falls Irrigation project at Coeur d'Alene, Idaho.

* * *

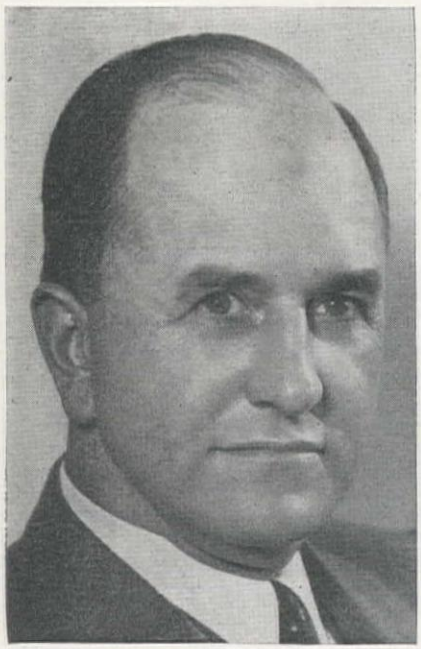
M. D. Bradshaw has just returned to the United States after two years as construction superintendent for the Public Roads Administration on the Inter-American Highway, in the Honduras section. He is now on leave and will be up for re-assignment soon in the western district.

* * *

Robert A. Finlayson, engineer with the Bureau of Reclamation in Denver, has been appointed city manager of Oregon City, Ore., succeeding **John L. Franzen,** who resigned to become city manager of Salem, Ore. Prior to the war Finlayson was city

manager of Montrose, Colo., and during the war he served as a naval architect with the U. S. Navy in Portland. Franzen had been city manager of Oregon City for 21 years, and during the war served as general manager of the federal war housing project, Vanport City, which became the second largest city in Oregon during this period.

* * *



S. D. BECHTEL

Bechtel Brothers-McCone Co., widely known engineering and construction organization, recently became Bechtel Corporation. At the same time three subsidiaries became respectively Bechtel International Corporation, Campania Bechtel, S. A., and International Bechtel, Inc. The change was made in the interest of simplification and convenience. Principal officers are **S. D. Bechtel,** president; **W. E. Waste, Van W. Rosendahl, J. Perry Yates, V. G. Hindmarsh, Jerome K. Doolan,** and **C. Stribling Snodgrass,** vice-presidents. Headquarters and major engineering offices are located in San Francisco.

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Jack Lay, county engineer of Jefferson County, Washington, has submitted his resignation to the new board of commissioners, and will vacate the position April 1, after 2½ years' service.

* * *

Hamilton G. Grady and **Leslie G. Jost,** structural engineers, recently announced their partnership as Grady & Jost, with offices at 6311 North Figueroa St., Los Angeles. Grady & Jost will specialize in the design of industrial and commercial structures.

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R. A. Roberts, field engineer for the Portland Cement Association, has established his business headquarters in Cheyenne, Wyo. Roberts' former headquarters was in Denver, Colo.

* * *

Frank Harrington, street superintendent in Yakima, Wash., for the past 14 years, resigned from that position this month. He had been employed in the department for 20 years.

M. W. Bennett, Colorado state director of the Federal Housing Administration since 1938, has resigned to enter private business. **Eugene F. Duffy,** administrative assistant to Bennett for the past eight months, becomes his successor. Bennett expects to enter the field of land development and house construction, in affiliation with a Denver realty firm.

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Frederick F. Aldridge has been appointed director of the division of sanitation of the Seattle health department. Aldridge comes to Seattle from Dallas, Tex., where he was regional sanitary engineering consultant for the National Housing Authority.

* * *

Jay Lalonde, head of the Lalonde Construction Co. of Sidney, Mont., was elected president of the Sidney Chamber of Commerce for 1947.

* * *

A. G. Hanson has been reappointed Klickitat County, Wash., engineer with headquarters at Goldendale.

* * *

L. H. Nishkian and **B. H. Nishkian** recently formed a father and son partnership in the capacities of consulting engineers. Their office is located at 1045 Sansome Street, San Francisco.

J. T. R. McCorkle, manager of the Idah Chapter of the Associated General Con tractors, was elected treasurer of the Idah chapter of the National Safety Council a the annual meeting of the chapter in Bois late in January.

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Conrad O. Mannes, formerly King Coun ty, Wash., engineer, has joined the staff o DeWitt C. Griffin & Associates, consultin engineers of Seattle.

* * *

H. L. Marchand recently opened a pri vate structural engineering office in th Balboa Building, 593 Market Street, Roor 423, San Francisco.

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Tony Marrazzo, Boise highway con tractor, was appointed as a member of th Idaho contractors' license board for a 6-y term, succeeding **Hank Knippel.**

* * *

Walter E. Rust and his son, **Earl,** for merly of Erie, Pa., are now contracting a 865½ Sunland Blvd., Roscoe, Calif. Th Rusts specialize in excavating, skiploading trucking, and bulldozing.

* * *

P. E. Jones has been appointed wate superintendent for Kelso, Wash., succeed ing the late **Tom Alexander.**

SUPERVISING THE JOBS

The Bethlehem Steel plant expansion at Vernon, California, is under the supervision of **James L. Marshall,** as resident engineer for the Bechtel Corporation. **Jerome Komes** is project manager, and **Earl E. Nichols,** general superintendent. Others of importance on the job are **B. C. Licklider,** office manager; **R. C. Denn,** excavation and concrete superintendent; **C. R. Culler,** carpenter superintendent; **H. S. Christensen,** reinforcing steel superintendent; **W. B. Anderson,** field engineer; **M. Badt,** office engineer; **H. Horne,** head timekeeper; **E. Skinnarland,** engineer. Carpenter foremen are **A. W. Gardner, C. H. Mann, W. M. Heinl, T. Futter, J. D. Weathers,** and **J. G. Gray. L. G. Kesler** is pile driving foreman, and **N. G. Briestieg,** cement finisher foreman. **J. F. Elms** is electrical foreman, with **D. C. Fritz** and **Dwight Stubbs,** reinforcing steel foremen, and **J. O. Sheldon,** operating engineer foreman. Labor foremen include **C. M. Taff, J. N. Callicotte, J. P. Brennan, L. Toupin,** and **C. J. Branstine.**

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R. D. Alexander is supervising the building of 2½ mi. of four-lane divided highway to bypass Auburn, Calif., one of the worst bottlenecks in the state, for Fredrickson & Watson Construction Co., of Oakland, Calif. Other personnel in important positions are **R. D. Ostrom,** grade foreman; **L. Walker,** concrete foreman; **M. L. Tilton,** grade foreman; **G. F. Aldridge,** master mechanic; **Ivan J. Broman,** drill crew foreman; and **H. J. Anderson,** office manager. The company also has another 1½-mi. contract for a new road from the four-lane highway to Grass Valley, Calif. **Edward L Miller** is resident engineer on the job fo the state.

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A. L. Billingsley is project manager, wit **Robert Fontana** as his assistant on a hous ing project consisting of both concrete an timber housing for Tavares & Johnson a Chula Vista and National City, Calif. Othe superintendents are **L. "Tex" Geneski** an **Hugh Heaton.** Concrete foreman, **H. A Hammer,** and labor foreman, **Ed Plataka** Carpenter foremen are **Jack Ross, W. E McCoy, Wm. Pace, G. H. Bratton, D. K Allen, A. D. Andrews,** and **Warren Cham bers.** Field office manager is **M. J. Bald win,** and timekeeper, **J. H. Reynolds.** On two-story apartment job in Chula Vista the firm completed pouring concrete on th lower floor in one week.

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E. L. Seitz is resident engineer for Pete Kiewit Sons' Co., on the construction o Highway 101 from Latigo Canyon t Malibu Creek, Malibu. District manager i **Thomas H. Paul,** with **H. C. Studer** a general superintendent. **A. M. "Speck Willis** and **Roy J. Hill** are grade superin tendents; **John F. McLaughlin,** job engi neer; **O. K. Hoeppner,** office manager; H "Fibber" **McGee,** shop foreman; **Clyd Prough,** grease superintendent; **E. P. Ale ridge,** labor foreman; **Fred C. Riley,** equip ment cost accountant. Other grade fore men are **Ralph C. Jackson, Ralph Kin canon, Arthur T. Murphy, Freddie Welsh** and **Charles H. Wicks.**

H. H. Westphal is managing the Arizona-Nevada Constructors project on the Friant-Kern Canal, Calif. **Jack Salters** is grading superintendent; **Don Hughes,** lining superintendent; **Randolph Denmon,** engineer; **S. A. Melquist,** office manager; **A. M. Zelt,** master mechanic; and **Bill Anderson,** concrete superintendent. Members of the Arizona-Nevada venture are S. J. Groves & Sons Co., Minneapolis, Minn.; Lee Moor Contracting Co., El Paso, Tex.; Bowen & McLaughlin, Phoenix, Ariz.; L. M. White, Tucson, Ariz.; and L. G. Lynch, Tucson, Ariz.

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Carl E. Copeland is general superintendent for Johnson-Western Company on all work in the San Diego area, on the job of installing 38 catwalks and dolphins at Piers 12 and 13 at the U. S. Naval Station. **Bill Whiteman** is pile driver foreman, **Roy Douglas,** rigger foreman, and **Manuel Frank** and **Dean High** in charge of framing.

* * *

W. F. "Bill" Joyce replaces **M. R. White** as general superintendent for the McNeil Construction Co. job of remodeling the Miramar Hotel, Santa Monica, Calif. **Richard F. Bright** takes over the job of office manager, succeeding **L. R. Peterson. Russ Caldwell** is carpenter foreman and **Jay Nichols** is labor foreman. **Frank Green,** architect for Hull Hotels of Calif., is engaged on the job.

* * *

The J. E. Haddock, Ltd. constructtion for the State of California of a highway and storm drain on Figueroa St., Los Angeles, is headed by **C. P. Montgomery** as resident engineer, with **Henry Rollston** as general superintendent. **R. McCloud** is carpenter foreman; **Roy W. Bennett,** equipment foreman; **Gordon H. Duffield,** office manager; and **J. H. Thomas, Jr.,** assistant engineer.

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J. A. Herkomer is superintendent for Bechtel Bros. Corp. on the Pacific Press Bldg. in Vernon, Calif. **P. D. Gilbert** is general carpenter foreman; **H. E. Holcomb,** carpenter foreman; **John Shaw,** labor foreman; **Whit Taff,** engineer, and **Gene Cameron,** office manager. **H. P. "Pat" Baker** is superintendent for the subcontractor, the California Electric and Construction Co.

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P. H. Bowen is supervising installation of a storm drain and sanitary sewer near the Hollywood Parkway, Los Angeles, for the Charles T. Brown Co. of San Fernando. Assisting Bowen is **Charles Burke** as general foreman, while **Dave Ireland** has the job of office manager. Project is expected to be completed by the middle of March.

* * *

C. W. Bailey is general superintendent for Myers Bros. on their job of building a sanitarium for Dr. Dreier of Glendale, Calif. **K. E. Meadows** is carpenter foreman. The Victory Engineering & Electric Co. is the subcontractor for the job. Other key men are **"Cam" Campbell,** general superintendent; **Earl Ostice,** plumbing contractor; **J. P. Carroll,** painting contractor; and **J. A. Powers,** brick contractor.

* * *

E. M. Jennett is project manager for Guy F. Atkinson Co., San Francisco, on a North Sacramento Freeway job. His assistant is **Ray Heinze,** and **H. S. Booth** is superin-

tendent. Other men important to the job are **K. S. Scheyers,** structural superintendent; **Frank B. Anderson,** general carpenter foreman; **Ed. Swanson,** concrete superintendent; **Ed Collins,** concrete foreman, and **Robert Hart, K. S. Hydorn, O. W. Ticen, A. G. Harrisberger,** and **Emil Ekdahl,** carpenter foremen. **John Thomas, Louis Rylen** and **Mike Papac** are labor foremen; **Frank W. Ryan,** master mechanic; **Thomas F. Foran,** office manager; and **L. R. Chambers,** paymaster.

* * *

William Kirlicks is supervising the job for Louis C. Dunn Construction Co. on a warehouse for the Rexall Company at Soto and Fruitman Ave., Vernon, Calif. **John Redford** is general carpenter foreman, with **Dale Dearman** as labor foreman, **Joe Garcia** as concrete foreman, and **Ralph Roberts,** timekeeper. **Red Loomis** is superintendent for Soule Steel Co., who have the steel contract.

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N. G. "Scotty" Kindness is job superintendent for Del E. Webb Construction Co., Phoenix, Ariz., on their $750,000 job of building a reinforced concrete warehouse building for the Kraft Food Company in Los Angeles. **E. T. Davies** is chief of operations and **Al A. Merrick,** job office manager. Work was started January 20.

* * *

G. M. Mann is project manager for Winston Bros. and Utah Construction Co., San Francisco, Calif., at their Columbia Basin job at Ephrata, Wash. **R. L. Wahl** is on the job as office manager and **Roy Harer** is superintendent. Engineer for the project is **A. P. Fisher,** with **Bill Williams** as paymaster.

* * *

J. M. Curran is resident engineer for the State Highway on the E. W. Elliot Construction Co. job on the Anaheim St. overhead of the Terminal Island Freeway which is being built in Los Angeles.

Husso Festich is general foreman for Atkinson-Kier-Bressi Bevanda on their joint project at Matillija Dam, Ventura, Calif. Mill foreman is **Wm. E. Gibbs,** and **Elvin Erickson** is master mechanic. Other important men are **Pete Noble,** purchasing agent; **Harry Horton,** auditor; **M. E. Noble,** superintending carpenter; **Ed Swanson,** concrete superintendent; **Frank Loesch,** concrete plant superintendent; and **Cy Dennis,** cement finishing superintendent.

* * *

P. W. Mourer, Jr., formerly field engineer for James W. Carey & Associates, consulting civil and electrical engineers, Seattle, Wash., and partner in a San Francisco, Calif., marine and mechanical engineering firm, is now general superintendent for Matt Malaspina & Co., with headquarters in Seattle.

* * *

John Yasich is supervising a job for the San Francisco Bridge Co., San Francisco, Calif. The company was awarded a $86,895 contract to dredge material from the Yacht Harbor of San Diego Bay. **Russell Francis** is captain of the dredge Beaver, with **Frank Lampson** as chief engineer of the dredge.

* * *

Chuck Sanford is supervising a three-story addition to the telephone building on Santa Fe Ave. in Huntington Park, Calif., for P. J. Walker Co. **Ed Paradis** is carpenter foreman, with **John Bull,** engineer. The structural steel part of the contract is in the hands of Bethlehem Steel Co.

* * *

C. W. Bingham and **William Pressly** are now connected with the Guy F. Atkinson-J. A. Jones Construction Co. on Okinawa. Bingham is employed as general foreman of structural steel, while Pressly has the job of superintendent of concrete pipe. Both men were formerly employed by Bechtel Bros.-McCone Const. Co., and worked in Arabia for a period of two years.

N. M. Ninteman as general superintendent for the P. J. Walker Co., has just finished construction on a million dollar factory for the Clayton Manufacturing Company at Rosemead, Calif. Carpenter foreman for the building of this model plant was **Roy Fowler.**

* * *

Roy L. Richardson is supervising construction of I. Magnin's new store building at Santa Barbara, Calif., for Wm. Simpson Construction Co. **Forrest Richardson** is carpenter foreman, and **Rudy Piskulie,** brick foreman. **L. A. Schumann** serves as chief accountant.

* * *

Kenneth Germer is job superintendent for Germer & Abbott, Tremonton, Utah, on a job consisting of building timber bridges and surfacing a stretch of State Hwy. 53 between Price, and Price airport in Utah. **Jed R. Abbott** is purchasing agent for the contract.

* * *

W. V. Cryderman is resident engineer for Oberg Bros. on construction of a $225,667 reinforced concrete overcrossing of the Hollywood Parkway at Grand Ave., Los Angeles. **A. T. Schunk** is general superintendent, and **E. L. Swanson,** office manager.

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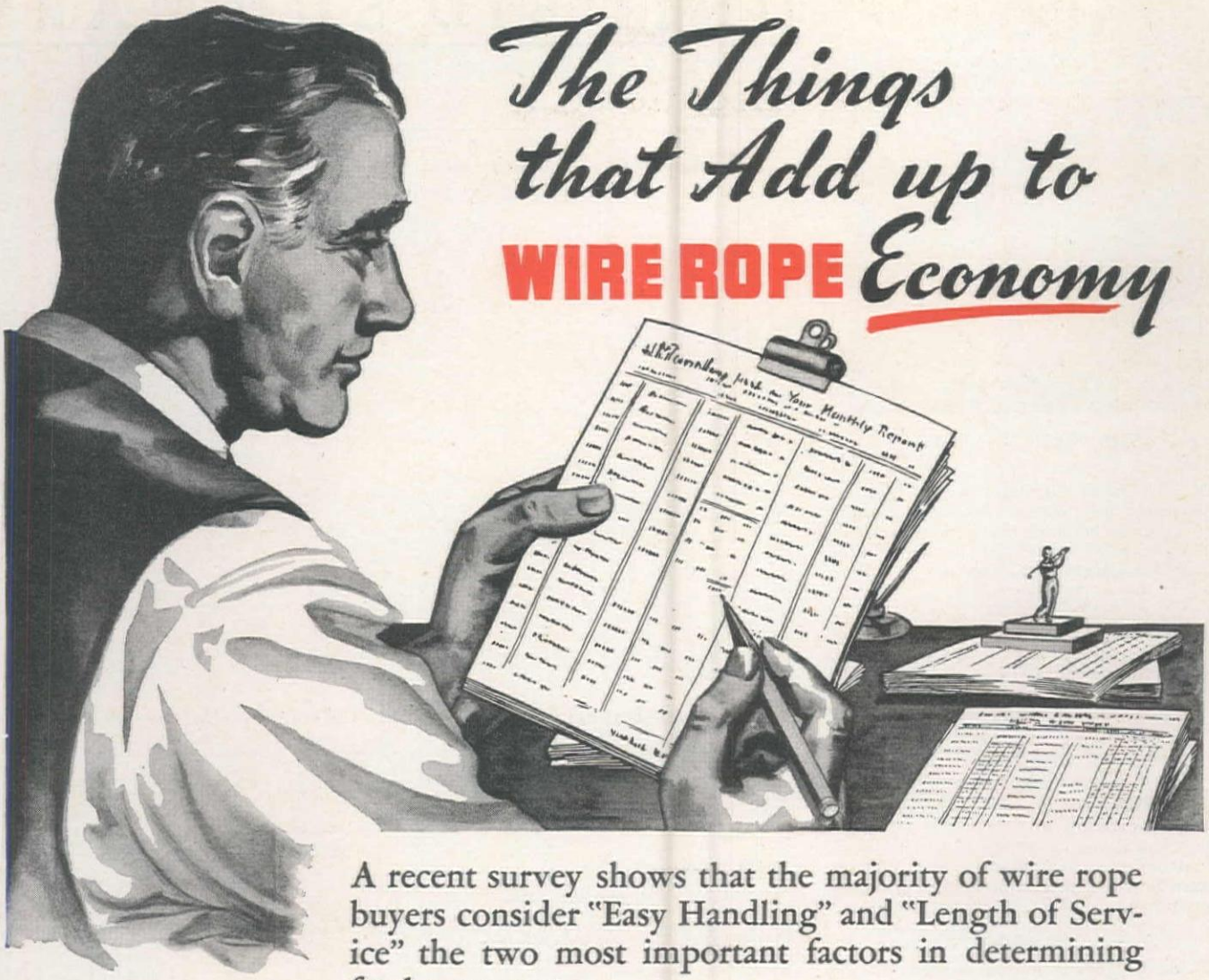
Fred J. Maurer is project manager for Fred J. Maurer & Son's job on Friant Kern Canal, Stilling Basin and Cottonwood Creek Bridge. **C. E. Brown** is general foreman under him, with **Harold Wark** carpenter foreman, **Milo Hardie,** labor foreman, and **Ike Erickson,** general foreman for the Cottonwood Creek Bridge.

* * *

A. J. Schwitters is supervising construction on a $1,214,370 job at Central Washington College of Education, Ellensburg, Wash., for MacLean Construction Co., Seattle. Other key men speeding erection

KEY MEN on the Del E. Webb Construction Co. contract to build the $6,000,000 Flamingo Club at Las Vegas, Nev., include, l. to r. foremen: J. W. SIMPSON, carpenter; FRANK HAHN, BOB ARTHINGTON, labor; JOE RALEY, carpenter; "RED" NORCUTT, electric; L. L. REDDICK, concrete; GEO. MULLINS, carpenter; M. STILWELL, labor; ART KISTLER, carpenter; B. F. SMITH, Jr., engineer on the job; Z. D. RICE, general foreman; E. E. RESENTS, yard foreman; R. R. THOMAS, general superintendent; LEE ADAMS, general foreman; CHAS. ROBERTSON, paymaster; B. B. COLLINS, office manager; and E. J. PAINTER, draftsman. The job has taken nearly a year to complete, but is finished except for cleanup.

The Things that Add up to WIRE ROPE Economy



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And more and more wire rope users are finding, by actual experience, that they can depend on Preformed "HERCULES" (Red-Strand) Wire Rope for these two top-ranking features. As it is available in a wide range of constructions – both Round Strand and Flattened Strand – they have *also* found that in "HERCULES" there is a *right rope* for any heavy duty purpose.

If you have not tried Preformed "HERCULES" (Red-Strand) Wire Rope you, too, would like its easy handling, smooth spooling and long life. Give it a chance to *prove* its money saving ability! We invite your inquiries.

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of the two-story building and boiler plant are **D. E. Schwitters**, assistant superintendent, and **R. C. Pike**, engineer.

N. B. "RED" BENNETT

N. B. "Red" Bennett has the job of supervising 0.4 miles of grading and surfacing for Beerman & Jones, Sonora, Calif. The location is Stockton St., between Solinsky & Washington Sts., Sonora.

Dave Wigner is superintendent for List & Clark Construction Co., Kansas City, Mo., on their $1,578,664 job on an embankment on Hordes Creek Reservoir and dam on Hordes Creek, Colemna Co., Tex. Other key men are **Joe Clark** and **J. R. DeWitt**, foremen.

J. G. Ellis is supervising the remodeling and waterproofing of the Operating Engineer's Local in Los Angeles for the Macco Construction Co., contractors. **Werner Grunwold** is carpenter foreman, while **Cliff Bishop** has the job of sandblast foreman.

R. A. Kerfoot is job superintendent for Cox Bros. Construction Co. of Stanton, Calif., on their $106,362 job of grading and paving .9 mile between Doheny Park & San Juan Creek, Orange Co., Calif. **R. Reif** is contractor's engineer.

Floyd Shoemaker, who was in business for himself for years, and lately was associated with Buttress-McClellan as carpenter foreman, is again returning to general contracting as of March first.

Ralph Bitter, formerly with Peter Kiewit Sons' Co. and Morrison-Knudsen Co., Inc., is now job superintendent with Frank T. Hickey, Inc., of Los Angeles.

C. G. Mow is supervising construction of an $87,992 grade school building at Coulee City, Wash., for A. M. Bengel, Spokane. **G. G. Bowden** is general superintendent for the job.

Roscoe Dietrick is supervising jobs for John C. Bystone at Santa Ana, Calif., where they have recently moved to a new yard covering five acres. Location is on First and Santa Ana Sts.

E. N. Norlin is construction superintendent for Campbell, Lowrie & Lautermilch of Chicago, in charge of constructing a $172,000 felt roofing manufacturing plant at 3750 NW. Yeon Avenue in Portland.

UNIT BID SUMMARY

Irrigation . . .

California—Contra Costa County—Bureau of Reclam.—Earthwork & Culverts

M. W. Brown of Redding, Calif., submitted the low bid before the Bureau of Reclamation at Sacramento, for earthwork and pipe culverts for the Los Medanos Wasteway Extension of the Contra Costa Canal, Central Valley Project. The amount of the bid was $11,849. Unit bids received were as follows:

(A)	M. W. Brown	$11,849	
(B)	Fredrickson & Watson Construction Co.	14,438	
(C)	Grant Construction Co.	14,745	
(D)	Macal Improvement Co., Inc.	14,801	
(E)	Harms Bros.	17,379	
(F)	Miles & Bailey	18,184	
(G)	F. E. Young	$18,997	
(H)	C. Dudley DeVelbiss	19,226	
(I)	Excavators, Inc.	22,752	
(J)	M.J.B. Construction Co.	23,154	
(K)	Stolte, Inc.	24,162	
(L)	Parish Bros.	29,820	
(M)	Madonna Construction Co.	38,804	

(1) 35,000 cu. yd. excavation, borrow, for emb.
(2) Lump sum, excavation for existing levee
(3) 100 cu. yd. excavation for structures
(4) 100 cu. yd. backfill
(5) 50 cu. yd. compacting backfill
(6) 100 cu. yd. riprap
(7) 5 cu. yd. concrete in structures
(8) 300 lbs. placing reinforcement bars
(9) 32 lin. ft. laying 18-in. dia. corr. metal pipe
(10) 24 lin. ft. laying 24-in. dia. corr. metal pipe
(11) Lump sum, installing flop gate

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
(1)	.29	.34	.3675	.40	.40	.44	.49	.46	.57	.55	.57	.77	1.00
(2)	200.00	500.00	375.00	75.00	400.00	500.00	150.00	404.00	$1,000	500.00	500.00	480.00	$1,000
(3)	2.00	2.00	1.50	.50	4.00	2.50	1.50	2.25	5.00	8.00	5.50	3.25	5.00
(4)	.25	.60	.43	.25	3.00	1.00	1.00	.80	1.00	2.00	1.50	1.50	1.50
(5)	1.50	3.00	3.50	.50	1.00	2.00	.50	3.60	3.00	2.00	4.00	4.60	4.00
(6)	8.50	12.00	6.25	3.00	17.00	12.00	10.00	16.60	7.00	16.00	15.00	10.00	15.00
(7)	47.50	70.00	60.00	40.00	70.00	50.00	60.00	88.00	50.00	90.00	200.00	98.00	50.00
(8)	.12	.04	.05	.15	.06	.18	.04	.20	.10	.10	.15	.10	.10
(9)	1.00	1.00	3.00	1.00	2.00	5.00	1.00	1.00	1.00	2.50	3.00	2.50	2.00
(10)	1.00	1.00	3.50	1.00	3.00	5.00	1.20	1.25	1.25	3.50	4.00	2.50	2.50
(11)	20.00	10.00	20.00	25.00	25.00	50.00	50.00	15.00	10.00	60.00	75.00	25.00	50.00

California—Imperial County—Bur. of Reclam.—Earthwork & Struct.

Otto B. Ashbach & Sons, St. Paul, Minn., submitted the low bid of $697,724 on Schedule 1, and Clyde W. Wood, Inc., North Hollywood, Calif., was low with a bid of $739,638 on Schedule 2 for the construction of earthwork canal lining and structures, from station 6106 plus 06 to station 6517 plus 00, Coachella Canal, All-American Canal System, Boulder Canyon Project, Arizona-Nevada-California. The work is situated in the vicinity of Indio. Schedule 1 provides for concrete lining and Schedule 2 provides for asphaltic lining and contract was awarded to Ashbach on Schedule 1. The unit bids follow:

		Schedule 1	Schedule 2
(A)	Otto B. Ashbach & Sons	$697,724	....
(B)	Vinnell Co.	772,462	....
(C)	Clyde W. Wood, Inc.	831,048	$739,638
(D)	Fisher Contracting Co.	873,377	....
(E)	Hensler Construction Corp. & MacDonald & Kruse, Inc.	874,572	819,339
(F)	J. F. Shea Co., & Morrison-Knudsen Co., Inc.	895,897	....
(G)	Bressi-Bevanda Constructors, Inc.	943,822	....
(H)	Haddock-Engineers, Ltd.	1,107,621	1,115,107

SCHEDULE 1

		(A)	(B)	(C)	(E)	(F)	(G)	(H)
250,000	cu. yd. excavation for canal	.345	.25	.52	.55	.45	.50	.385
30,000	cu. yd. excav. in borrow pits	.36	.31	.40	.55	.50	.50	.46
610,000	sta. cu. yd. overhaul, 3 to 12 stations	.03	.013	.015	.02	.02	.015	.02
50,000	mi. cu. yd. overhaul, total haul in excess of 12 stations	.26	.12	.20	.16	.30	.25	.25
92,000	cu. yd. compacting embankments	.43	.34	.37	.55	.40	.50	.45
9,700	cu. yd. excav. for struct.	.85	1.00	2.00	2.00	2.00	2.00	2.50
220	cu. yd. compacted subbase	2.00	6.50	2.00	3.00	3.00	3.50	6.00
187,300	sq. yd. trim foundation for conc. lining	.18	.30	.40	.50	.40	.50	1.37
5,900	cu. yd. backfill about struct.	.50	.90	.35	2.00	1.00	.60	2.15
2,500	cu. yd. compacting backfill	2.00	1.50	2.50	2.00	2.50	3.50	6.20
8,800	cu. yd. backfill at top of conc. lining	.44	.55	.35	.50	.50	.60	2.00
940	cu. yd. concrete in struct.	41.00	50.00	65.00	60.00	65.00	68.00	87.00
9,170	cu. yd. concrete in reinf. canal lining	15.00	20.00	16.84	16.50	19.00	19.50	19.00
9,170	cu. yd. concrete in unreinf. canal lining	15.00	20.00	16.84	16.50	19.00	19.50	19.00
27,000	bbl. furn. and handling Portland cement	4.00	3.50	3.50	3.40	4.00	4.00	3.50
124,000	lb. furn. and place reinf. bars ¾-in. dia. and larger	.08	.10	.11	.08	.09	.10	.10
275,000	lb. placing reinf. fabric in canal lining	.038	.035	.04	.035	.04	.045	.04
665	sq. ft. placing elastic filler material in jts.	.20	.75	1.50	1.50	1.50	1.50	1.00
460	lin. ft. placing rubber waterstops in joints	.50	1.30	1.50	1.50	1.50	1.25	2.00
89	Mfbm. furn. and erect. timber in struct.	200.00	300.00	175.00	225.00	250.00	225.00	290.00
5,200	lin. ft. laying 10-in. dia. conc. pipe	1.25	.90	2.00	1.75	2.00	2.50	1.25
120	lin. ft. laying 12-in. dia. conc. pipe	1.30	1.75	2.25	2.50	3.00	2.50	1.25
160	lin. ft. laying 14-in. dia. conc. pipe	1.40	1.75	2.50	2.75	3.00	2.50	1.25
160	lin. ft. laying 18-in. dia. conc. pipe	1.75	1.85	2.75	3.00	3.50	2.75	1.50
160	lin. ft. laying 24-in. dia. conc. pipe	2.50	2.25	3.25	3.25	3.50	3.00	2.00
120	lin. ft. laying 30-in. dia. conc. pipe	3.00	4.25	3.75	3.50	3.75	4.00	2.50
140	lin. ft. laying 36-in. dia. conc. pipe	3.50	4.25	4.25	3.75	4.00	5.00	3.00
38,800	lbs. install gates and gate hoists	.15	.15	.20	.20	.30	.25	.25
7,400	lbs. install misc. metalwork	.15	.40	.30	.40	.50	.40	.25
200	lb. install ground wires	1.40	2.00	1.50	1.50	2.50	2.00	1.00

SCHEDULE 2

259,000	cu. yd. excav. for canal	.52	.55		.385
26,000	cu. yd. excav. in borrow-pits	.40	.55		.46
780,000	sta. cu. yd. overhaul, 3 to 12 stations	.015	.02		.02
47,500	mi. cu. yd. overhaul, total haul in excess of 12 stations	.20	.16		.25
92,000	cu. yd. compacting embankments	.37	.55		.45
9,700	cu. yd. excav. for structs.	2.00	2.00		2.50
220	cu. yd. compacted subbase	2.00	3.00		6.00
194,200	sq. yd. trim and prepare foundations for asph. lining	.40	.50		1.37
194,200	sq. yd. apply soil sterilant	.03	.10		.15
5,900	cu. yd. backfill about struct.	.35	2.00		2.15
2,500	cu. yd. compacting backfill	2.50	2.00		6.20

(Continued on next page)

VALLEY CR
& RIGGING
Cover Thous
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With Lora
Moto-Crai

The Valley Crane & Rigging Co. (Daigh & Stewart), Bakersfield, California, use two of their three Moto-Cranes to wrestle a 22-ton draw works onto a trailer. One of these MC416 Moto-Cranes has covered 8,543 miles in 8 months, the other 5,030 miles in 7 months, in serving similar and other widely separated heavy lift jobs all over the extensive areas of the oilfields. With much of their travel off the beaten paths, they find the front wheel drive of the "416" a big asset.

Lorain Moto-Crane speed and mobility add up to more jobs and greater profits. Outsanding Lorain features, which contribute to this profit-making performance, in Lorain Center Drive on turntable for direct-t application; (2) Balanced turntable design fo capacity; (3) The Steel Erectors Precision Bo speed derricking and precision power-contr The sturdy carrier chassis, built exclusively for (5) 10 travel speeds, 1 to 30 m.p.h.; (6) Sof for off-the-road travel.

THE THEW SHOVEL COMPANY,

See Your **THEW Lorain** REG. U. S. TRADE MARK *Dealer*

LE ROI-RIX MACHINERY CO., Los Angeles 11

CATE EQUIPMENT CO., Salt Lake City 4

LIBERTY TRUCKS & PARTS CO., Denver 1

COAST EQUIPMENT COMPANY, San Francisco 1

A. H. COX & CO., Seattle 4, Washington

BUNTING TRACTOR CO., INC., Boise, Twin Falls, Gooding, Fairfield, and Burley, Idaho; LaGrande, Oregon

CONNELLY MACHINERY COMPANY, Billings and Great Falls, Montana

SANFORD TRACTOR & EQUIPMENT CO., Reno, Nevada

THE MOUNTAIN TRACT Missoula, Montana

THE TRACTOR & EQUIP Sidney, Montana

MILES CITY TRACTOR Miles City, Montana

P. L. CROOKS & CO., Po

LEE REDMAN EQUIPME 2020 West Grant S

WORTHAM MACHINER Cheyenne, Wyoming *Branches:* **Sheridan, and Rock Springs**

9,000	cu. yd. backfill at top of asph. lining	.35	
940	cu. yd. concrete in struct	65.00	6(
1,360	bbl. furn. and handling Portland cement	4.00	
194,200	sq. yd. asph. canal lining, except asphalt	1.30	
2,140	tons furn. asph. for base crse. for canal lin'g	18.00	2(
167	tons furn. asph. for seal treatment	80.00	5(
124,000	lb. furn. and place reinf. bars ¾-in dia. and larger	.11	
245	sq. ft. place elastic filler matl. in joints	1.50	
460	lin. ft. place rubber waterstops in joints	1.50	
89	Mfbm. furn. and erect timber in struct	175.00	22
5,200	lin. ft. laying 10-in. dia. conc. pipe	2.00	
120	lin. ft. laying 12-in. dia. conc. pipe	2.25	
160	lin. ft. laying 14-in. dia. conc. pipe	2.50	
160	lin. ft. laying 18-in. dia. conc. pipe	2.75	
160	lin. ft. laying 24-in. dia. conc. pipe	3.25	
120	lin. ft. laying 30-in. dia. conc. pipe	3.75	
140	lin. ft. laying 36-in. dia. conc. pipe	4.25	
38,800	lb. install gates and gate hoists	.20	
7,400	lb. install miscl. metalwork	.30	
200	lbs. install ground wires	1.50	

Bridge and Grade Separation

Washington—Wahkiakum County—State—

M. P. Butler, Seattle, Wash., was low before the Washington State Departme with a bid of $193,017 for construction of the Rosburg Bridge on Secondary Sta tract was awarded to M. P. Butler, with time for completion 240 calendar days.

(1) M. P. Butler.....$193,017 (2) Larson & Palmbe

1,100	cu. yd. structure excavation
558	cu. yd. concrete, Class A, in place
700	cu. yd. concrete, Class F, in place
300	cu. yd. concrete, Class H, in place
136,000	lbs. steel reinforcing bars in place
20	only, bridge drains complete in place
13	M.B.M. timber and lumber (salts treated) in place
175	M.B.M. timber and lumber (creosote treated) in place
16,520	lin. ft. furn. timber piling (untreated) at site
236	only, driving timber piles (untreated) in place
15,330	lin. ft. furn. timber piling (creosote treated) at site
219	only, driving timber piles (creosote treated) in place

California—Kern County—State—Bridge and Fo

Guy F. Atkinson Co., South San Francisco, submitted the low bid of $1,09 Division of Highways, Sacramento, for the construction of one concrete brid bridges and to grade and apply bituminous surface treatment to approximately 10. Tehachapi. Unit bids follow:

(A)	Guy F. Atkinson Co.	$1,096,600	
(B)	N. M. Ball Sons	1,173,519	
(C)	Winston Bros. Co.	1,212,284	
(D)	Bressi & Bevanda	1,239,881	
(E)	Morrison-Knudsen Co., Inc.	1,295,889	
(F)	A. Teichert & Son		
(G)	Clyde W. Wood,		
(H)	Vinnell Co.		
(I)	Haddock-Enginee		

(1)	Lump sum, clearing and grubbing
(2)	555,000 cu. yd. roadway excav.
(3)	15,500 cu. yd. struc. excav.
(4)	2,575 cu. yd. bridge struc. excav.
(5)	4,230 cu. yd. ditch and channel excav.
(6)	8,500 cu. yd. trench excav.
(7)	5,090,000 sta. yd. overhaul
(8)	28,500 sq. yd. compacting orig. ground
(9)	62,000 cu. yd. imported borrow
(10)	Lump sum, dev. wat. sup. & furn. wat. equip.
(11)	4,310 M. gals. applying water
(12)	541 sta. finishing roadway
(13)	194,000 sq. yd. prep. mix. and shaping surf. (bit. surf. tr.)
(14)	2,020 tons liquid asph. SC-4 (bit. surf. tr.)
(15)	1,495 cu. yd. Cl. "A" P.C.C. (struc.)
(16)	152 cu. yd. Cl. "A" P.C.C. (footing blocks)
(17)	10 cu. yd. Cl. "A" P.C.C. (trash racks)
(18)	335 cu. yd. Cl. "C" P.C.C.
(19)	4,000 cu. yd. P.C.C. walls
(20)	186,700 lb. furn. bar reinf. steel
(21)	186,700 lb. placing bar reinf. steel
(22)	95,000 lb. placing R.R. rails
(23)	44 lin. ft. timber bridge railing
(24)	3,980 lbs. misc. steel
(25)	2,050 lin. ft. furn. steel piling
(26)	64 ea. driving steel piles
(27)	7 ea. steel pile splices
(28)	Lump sum, inside
(29)	6,000 sq. ft. pneu
(30)	1 ea. cast steel fra
(31)	2,412 cu. yd. rubb
(32)	2,800 cu. yd. rubb
(33)	30 cu. yd. P.C.C.
(34)	205 ea. monument
(35)	660 lin. ft. metal
(36)	100 ea. culvert ma
(37)	275 ea. guide post
(38)	15.5 mi. new prop.
(39)	3.0 mi. new prop.
(40)	0.5 mi. rem. and
(41)	35 ea. drive gates
(42)	3,450 lin. ft. 8-in. ga.)
(43)	1,426 lin. ft. 24-in
(44)	292 lin. ft. 30-in.
(45)	150 lin. ft. 36-in.
(46)	216 lin. ft. 36-in.
(47)	524 lin. ft. 48-in.
(48)	60 lin. ft. 90-in. (512-18)
(49)	5,500 cu. yd. rock
(50)	80 ea. spillway ass
(51)	38 lin. ft. salvagin
(52)	38 lin. ft. relaying
(53)	Lump sum, engine

		(A)	(B)	(C)	(D)	(E)	(F)	
(1)	.....	$14,000	$15,000	$4,000	$2,500	$15,000	$12,000	$1
(2)	.....	.57	.78	.71	.60	.81	.80	
(3)	.....	2.25	1.90	3.00	2.50	4.00	3.70	
(4)	.....	5.00	11.00	4.30	5.00	9.00	5.70	
(5)	.....	1.50	2.00	2.10	2.00	3.50	1.50	
(6)	.....	1.25	1.50	1.20	1.00	1.00	1.10	
(7)	.....	.005	.008	.006	.006	.01	.007	
(8)	.....	.05	.03	.04	.06	.10	.07	
(9)	.....	.90	.95	.90	1.55	.75	.95	
(10)	.....	$5,000	$3,000	$3,000	$5,000	$30,000	$4,000	$
(11)	.....	2.50	1.90	3.25	2.50	1.50	1.75	
(12)	.....	15.00	10.00	15.00	25.00	12.00	12.00	
(13)	.....	.10	.065	.12	.12	.08	.09	
(14)	.....	16.00	16.00	16.00	17.50	15.00	17.50	
(15)	.....	55.00	50.00	55.00	65.00	40.00	65.00	
(16)	.....	30.00	30.00	40.00	62.50	30.00	39.00	
(17)	.....	95.00	63.00	80.00	95.00	110.00	150.00	
(18)	.....	40.00	30.00	40.00	55.00	30.00	37.00	
(19)	.....	31.00	26.00	32.00	45.00	30.00	37.00	
(20)	.....	.065	.08	.06	.05	.04	.07	
(21)	.....	.045	.02	.04	.035	.04	.03	
(22)	.....	.05	.04	.04	.03	.05	.03	

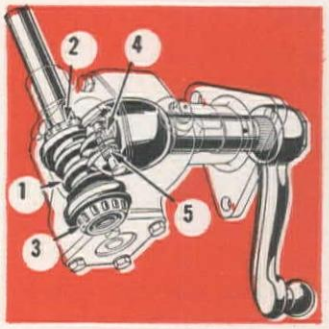
(Continued on next page)

REGISTRATIONS *SHOW* IT — OPERATORS *KNOW* IT!

"FORD TRUCKS LAST LONGER!"

ONE big reason— FORD STEERING STANDS UP!

Ford worm-and-roller steering gear reduces *rubbing* friction to a minimum. *Rolling contact* is employed to reduce friction at five vital points. This spares muscle and saves wear. The worm gear (1) is straddle-mounted on two large, opposed, tapered roller bearings (2 and 3). The worm acts upon an easy-turning roller instead of a common sliding cam or split-nut, and this roller is mounted on two needle-type roller bearings (4 and 5). Bearings of both the worm and the sector shafts may be adjusted, thus promoting long life and proper action with less replacing of parts.



Ford

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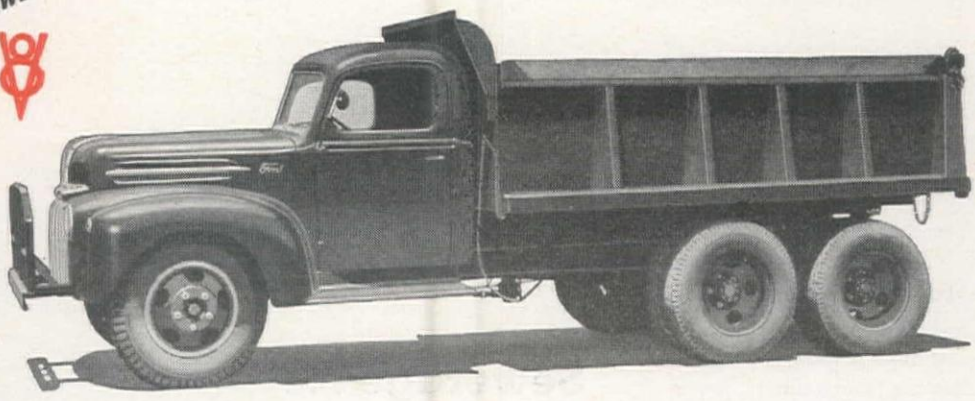


A popular adaptation of the basic Ford heavy duty chassis —equipped with Fabco Dual Drive and 6-Yd. to 7-Yd. Dump body, now in service in Concord, California.

ONLY FORD GIVES YOU ALL THESE LONG-LIFE TRUCK FEATURES: Your choice of two great engines, the V-8 or the Six—semi-centrifugal clutch that needs no maintenance lubrication—rear axle design that takes all weight-load off the shafts (¾-floating in half ton units, full-floating in all others)—heavy channel section frames, *doubled* between springs in heavy duty models—big, easy-action brakes, with heavy, cast drum surfaces, non-warping and score-resistant —extra-thick sheet metal in cabs, cowls, skirts and fenders—all told, more than fifty such examples of Ford endurance-engineering.

That's why FORD TRUCKS LAST LONGER . . . why, as the national truck count for 1946 just released shows, *more than half of all Ford Trucks in use are at least 9 years old* . . . why there are more Ford Trucks in service now than ever before in history. More than 100 body-chassis combinations to choose from. Ask your Ford Dealer.

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE

(23)	6.00	4.00	4.00	6.00	3.50	4.00	5.00	5.50	6.25
(24)	.50	.50	.40	.40	.50	.35	.20	.50	.75
(25)	3.25	4.00	3.00	2.25	2.25	3.50	2.50	3.00	2.75
(26)	75.00	125.00	75.00	40.00	90.00	165.00	75.00	75.00	70.00
(27)	25.00	23.00	25.00	25.00	25.00	25.00	25.00	40.00	33.00
(28)	$2,000	$2,500	900.00	$3,000	300.00	$2,000	$1,500	$1,500	$1,000
(29)	.50	.25	.40	1.00	.80	.50	.30	1.00	.95
(30)	100.00	80.00	150.00	100.00	75.00	100.00	150.00	100.00	125.00
(31)	31.50	27.00	40.00	34.00	40.00	41.50	46.00	13.50	39.25
(32)	32.00	20.00	28.00	24.00	30.00	22.00	46.00	13.50	31.60
(33)	50.00	40.00	40.00	40.00	35.00	75.00	25.00	30.00	35.00
(34)	5.50	7.50	8.00	5.00	5.00	6.00	6.00	10.00	6.25
(35)	4.50	3.00	2.50	3.00	2.50	3.60	4.00	3.50	3.75
(36)	4.50	5.00	4.50	5.00	5.00	6.00	6.00	4.50	3.75
(37)	5.50	5.00	5.00	5.00	5.00	6.00	6.00	6.50	3.60
(38)	$1,150	$2,700	$2,200	$2,024	$1,900	$2,100	$1,600	$1,500	$2,800
(39)	$1,150	$2,700	$2,200	$2,024	$1,900	$2,000	800.00	$1,500	$2,660
(40)	$1,150	$1,200	$1,900	$1,725	$1,500	$1,700	$1,200	$1,500	$1,250
(41)	50.00	75.00	100.00	80.00	70.00	80.00	50.00	80.00	75.00
(42)	1.50	2.10	1.50	2.00	1.50	1.60	2.00	1.80	1.50
(43)	4.25	4.20	3.80	5.40	4.50	4.20	4.00	4.30	3.55
(44)	5.75	5.30	5.00	7.00	5.50	5.30	6.00	5.50	4.70
(45)	9.50	8.60	9.00	12.00	9.00	9.20	7.50	9.50	8.25
(46)	12.00	10.50	10.00	13.50	11.40	11.00	8.00	11.00	11.00
(47)	15.50	14.00	14.50	16.60	14.50	15.00	11.00	15.00	13.50
(48)	50.00	36.00	25.00	30.00	27.00	26.00	45.00	50.00	30.00
(49)	7.50	5.60	8.00	8.00	8.50	6.00	7.50	8.60	10.00
(50)	32.50	37.00	30.00	25.00	22.00	40.00	25.00	33.00	30.00
(51)	2.50	1.00	2.00	2.50	2.00	2.00	2.00	4.00	1.50
(52)	2.50	1.00	2.00	2.50	2.00	2.00	2.00	3.00	1.50
(53)	$5,000	$3,000	$2,500	$2,000	$1,450	$2,500	$1,200	$4,500	$2,500

California—Los Angeles County—State—Overcrossing

Winston Bros. Co., Los Angeles, was low bidder with a proposal of $485,769 to the California Division of Highways for the construction of a reinforced concrete box girder overcrossing on Arroyo Seco Parkway at Sunset Blvd., Los Angeles. The largest single expenditure totalling $222,300 is for 4,275 cu. yd. of Class "A" Portland concrete cement for the structure. The following unit bids were submitted:

(1) Winston Bros. Co. $485,769
(2) E. B. Bishop 556,427
(3) Contracting Engineers Co. 585,170
(4) Carlo Bongiovanni Construction Co. 595,568
(5) Haddock Co. $599,268
(6) Guy F. Atkinson Co. 634,169
(7) Peter Kiewit Sons' Co. 712,054

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
1,300	cu. yd. rem. conc.	5.00	3.00	3.00	5.00	6.25	4.00	7.50
58,000	cu. yd. roadway excav.	.85	1.10	.70	1.00	.90	1.00	1.40
2,400	cu. yd. struct. excav. (overcr.)	2.50	3.50	2.00	3.50	4.65	5.00	9.60
2,000	cu. yd. struct. backfill (overcr.)	2.00	2.25	1.50	2.50	2.35	3.50	1.80
8,600	cu. yd. struct. excav.	2.20	4.00	1.50	.40	3.60	5.50	4.50
1,300	cu. yd. imported borrow	3.00	4.25	2.00	3.50	3.75	3.50	4.40
1,420	tons P.M.S.	5.00	5.00	5.50	5.75	5.00	5.50	6.80
1,570	tons asph. conc.	4.50	4.75	5.00	4.75	5.00	5.50	6.10
37	cu. yd. Class "A" P.C.C. (aprons)	25.00	21.00	30.00	20.00	19.00	30.00	41.00
4,275	cu. yd. Class "A" P.C.C. (structure)	52.00	56.00	65.00	62.00	67.50	67.00	72.50
34	cu. yd. Class "C" P.C.C. (pipe reinf.)	21.00	16.00	15.00	40.00	17.50	20.00	20.00
60,000	lbs. misc. iron and steel	.30	.30	.40	.30	.23	.25	.26
2,047	lin. ft. furnishing steel piling	2.50	2.10	2.00	2.50	2.45	2.30	2.75
89	ea. driving steel piles	55.00	62.00	40.00	45.00	47.00	50.00	50.00
9	ea. steel pile splices	18.00	25.00	15.00	20.00	25.00	15.00	30.00
166	cu. yd. Class "A" P.C.C. (curbs, gutters and sidewalks)	33.00	27.00	40.00	35.00	30.00	27.00	35.00
80	lin. ft. 18-in. R.C.P. (std. str.)	3.50	15.00	6.00	4.50	3.80	5.50	8.00
20	lin. ft. 21-in. R.C.P. (std. str.)	4.00	16.00	8.00	4.50	4.50	6.50	10.00
175	lin. ft. 24-in. R.C.P. (1750D)	5.20	18.00	10.00	9.35	6.35	10.00	13.00
16	lin. ft. 36-in. R.C.P. (800D)	8.00	16.00	15.00	16.16	7.35	13.00	14.00
88	lin. ft. 36-in. R.C.P. (1500D)	8.50	24.00	17.00	16.16	8.10	15.00	3.00
192	lin. ft. 42-in. R.C.P. (1500D)	10.50	27.00	22.00	18.00	11.15	22.00	19.00
213	lin. ft. 60-in. R.C.P. (1500D)	17.00	32.00	35.00	25.30	18.45	27.00	52.00
18	lin. ft. 4-in. vitrified clay pipe	1.30	4.00	4.00	3.00	1.50	2.50	4.00
392	lin. ft. 6-in. vitrified clay pipe	1.50	4.00	5.00	3.00	1.50	4.50	4.00
205	lin. ft. 8-in. vitrified clay pipe	2.00	5.00	6.00	3.25	1.65	5.50	4.00
1,930	lin. ft. 8-in. vitrified clay pipe (extra str.)	2.00	6.00	8.00	5.40	1.88	6.50	6.00
30	lin. ft. 15-in. plain conc. pipe	1.50	5.00	5.00	4.00	2.80	6.00	4.00
1,112,500	lbs. furn. bar reinf. steel	.05	.045	.05	.07	.0625	.06	.06
1,112,500	lbs. placing bar reinf. steel	.03	.03	.035	.0125	.027	.03	.04
752	lin. ft. steel railing	8.00	5.10	6.00	5.35	5.70	5.00	7.00
14	lin. ft. pipe shaft manholes (storm drains)	12.50	20.00	20.00	15.00	15.65	35.00	16.00
1	ea. remodeling existing manholes	150.00	125.00	150.00	25.00	125.00	150.00	150.00
149	lin. ft. new brick manholes	20.00	35.00	20.00	40.00	26.25	35.00	25.00
1,230	lin. ft. timber curb and rail	2.60	2.25	4.00	3.00	3.80	3.00	5.00
320	lin. ft. portable timber guard rail	2.00	3.50	5.00	6.00	5.40	3.50	4.00
225	lin. ft. timber stairs and rail	1.00	3.50	5.00	3.75	2.00	4.00	3.00
Lump sum,	detour lighting	$1,800	$2,500	$3,000	$2,000	$2,650	$1,650	$4,200
Lump sum,	electrical equipment	$7,000	$13,600	$16,000	$14,000	$13,550	$17,500	$20,000
Lump sum,	misc. items of work	$15,000	$1,000	$20,000	$44,290	$10,000	$2,600	$1,512

Sewerage . . .

California—Los Angeles County—City—Trunk Lines

R. A. Wattson, North Hollywood, submitted the low bid of $315,746 to the City Council of Arcadia to install approximately 12.8 mi. of 8-in. to 18-in. vitrified clay pipe sewer lines in various streets of Arcadia. All unit bids submitted follow:

(1) R. A. Wattson $315,746
(2) Steve P. Rados 327,546
(3) M. Miller Co. 329,076
(4) Mike Radich & Co. $371,345
(5) Martin Construction Co. 417,113

		(1)	(2)	(3)	(4)	(5)
20	cu. yd. cr. rk. or grav., repl. unsat. subgrade matl.	5.00	5.00	10.00	10.00	5.00
17,640	lin. ft. 8-in. std. str. vitr. clay pipe sewer with cem. mort. jts.	2.45	2.75	2.15	2.60	3.70
520	lin. ft. 8-in. ex. str. vitr. clay pipe sewer with cem. mort. jts.	2.55	3.20	3.25	3.00	4.50
4,135	lin. ft. 10-in. std. str. vitr. clay pipe sewer with cem. mort. jts	3.25	2.85	3.60	3.10	4.00
1,945	lin. ft. 10-in. ex. str. vitr. clay pipe sewer with cem. mort. jts.	3.50	3.40	4.70	3.50	4.80
2,700	lin. ft. 12-in. std. str. vitr. clay pipe sewer with cem. mort. jts.	3.35	3.10	3.75	4.00	5.00
1,610	lin. ft. 12-in. ex. str. vitr. clay pipe sewer with cem. mort. jts.	3.50	3.75	4.90	4.50	5.80
5,005	lin. ft. 18-in. std. str. vitr. clay pipe sewer with cem. mort. jts.	5.65	5.60	5.75	6.30	8.80
170	lin. ft. 18-in. ex. str. vitr. clay pipe sewer with cem. mort. jts.	6.05	6.00	7.05	7.00	9.80
17,630	lin. ft. 8-in. std. str. vitr. clay pipe sewer with bit. comp. jts.	2.50	2.95	2.25	2.70	4.00

(Continued on next page)

The economics of corrosion-proof pipelines

REQUIRE **Stability of protective coating**

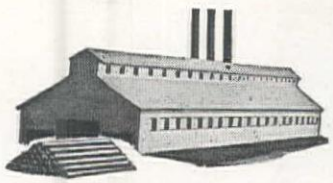
Modern application and electrical inspection

Cathodic protection

The effectiveness of the electrical insulating properties of Barrett Coal-tar Enamels is not changed by varying moisture content of the soil during changes in weather, season or time itself — factors which are necessary to make cathodic protection effective and economical.

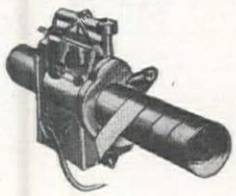
Over the years, uniformly satisfactory results have been obtained when Barrett Coal-tar Enamels have been applied by modern methods, and electrically inspected, to insure continuity of the electrical insulation.

Protection applied in transit



Modern equipment for the proper application of primers and enamels over mechanically cleaned pipe is available at numerous application contractors' plants, which apply Barrett protective coating systems while the pipe is in transit to your destinations.

Protection applied in the field



Thousands upon thousands of miles of pipelines have been protected with Barrett primers, enamels and asbestos felts, application being made over the ditch with modern traveling coating equipment and with increasing efficiency and low costs.

Either way, the combination of proved coating materials and proved application methods will assure the economy of your investment in cathodic protection.

THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

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

Barrett COAL-TAR ENAMEL

Reg. U.S. Pat. Off.

516	lin. ft. 8-in. ex. str. vitr. clay pipe sewer with bit. comp. jts.	2.60	3.50	3.35	3.10	4.80
4,135	lin. ft. 10-in. std. str. vitr. clay pipe sewer with bit. comp. jts.	3.40	3.00	3.75	3.25	4.80
1,944	lin. ft. 10-in. ex. str. vitr. clay pipe sewer with bit. comp. jts.	3.55	3.55	4.85	3.65	5.80
2,700	lin. ft. 12-in. std. str. vitr. clay pipe sewer with bit. comp. jts.	3.35	3.25	3.95	4.50	5.40
1,605	lin. ft. 12-in. ex. str. vitr. clay pipe sewer with bit. comp. jts.	3.55	3.90	5.10	5.00	6.80
5,000	lin. ft. 18-in. std. str. vitr. clay pipe sewer with bit. comp. jts.	5.65	5.90	6.00	6.50	9.00
170	lin. ft. 18-in. ex. str. vitr. clay pipe sewer with bit. comp. jts.	6.00	6.50	7.30	7.20	10.00
835	ea., 8x6-in. wye branches	1.25	1.60	1.90	2.00	2.00
449	ea., 10x6-in. wye branches	1.70	1.90	2.70	3.00	2.50
309	ea., 12x6-in. wye branches	2.50	2.20	3.45	6.00	3.00
354	ea., 18x6-in. wye branches	9.50	5.60	9.00	9.00	4.00
131	ea., standard manhole base	15.00	10.00	22.00	18.00	10.00
80	ea., junction manhole base	15.00	12.00	22.00	24.00	11.00
15	ea., drop manhole base	21.00	14.00	45.00	32.00	12.00
2	ea., double drop manhole base	29.00	16.00	65.00	40.00	14.00
2,217	lin. ft. manhole shaft	15.00	16.00	13.00	25.00	12.00
228	ea., manhole frame and cover set	50.00	40.00	50.00	50.00	40.00
1	ea. connection to existing manhole	40.00	75.00	25.00	100.00	50.00
220	lin. ft. 8-in. sewer line under railroad track	35.00	20.00	25.00	34.00	8.00
35	lin. ft. 12-in. sewer line under railroad track	40.00	25.00	30.00	40.00	10.00
50	cu. yd. replacing concrete pavement	21.00	14.00	17.00	23.00	15.00
2,000	cu. yd. replacing asphalt surfacing	12.00	15.00	16.00	15.00	12.00
Lump sum,	pumping station	$8,000	$8,500	$8,500	$9,647	$8,500
11	cu. yd. concrete encasement	14.00	14.00	176.00	18.00	.....

California—Los Angeles County—County—Outfall

Tom L. Gogo, Los Angeles, was low before the County Sanitation District No. 2 of Los Angeles, with a bid of $345,262 for the construction of Unit 1, Section 6 of Joint Outfall "B", from a point in Main St., 93 ft. east from the center line of Garfield Ave. in the Hollydale district, north of Rives Ave., about 22 ft. south of the center line of Florence Ave. The unit bids follow:

(A) Tom L. Gogo $345,262
(B) Burch & Bebek 349,609
(C) Bebek & Brkich 374,180
(D) Artukovich Bros. 386,449
(E) V C K Construction Co. $388,246
(F) Steve P. Rados 389,625
(G) R. A. Wattson Co. 429,574
(H) Martin Construction Co. 492,368

(1) 15,856 lin. ft. 57-in. reinf. conc. pipe sanitary sewer betw. Sta. 33 plus 64.37 and Sta. 183 plus 01.29, (a) using centrifugal RC pipe, 1000 D loading, (b) using precast RC pipe, 1000 D loading;
(2) 540 lin. ft. 54-in. reinf. conc. pipe sanitary sewer betw. Sta. 11 plus 58 and Sta. 17 plus 00, (a) using centrifugal RC pipe, 2500 D loading, (b) using precast RC pipe, 2500 D loading;
(3) 408 lin. ft. 54-in. reinf. conc. pipe sanitary sewer betw. Sta. 7 plus 50 and Sta. 11 plus 58, (a) using centrifugal RC pipe, 1750 D loading, (b) using precast RC pipe, 1750 D loading;
(4) 2,408 lin. ft. 54-in. reinf. conc. pipe sanitary sewer betw. Sta. 0 plus 00 and Sta. 7 plus 50; Sta. 17 plus 00 and Sta. 33 plus 64.37, (a) using centrifugal RC pipe, 1000 D loading, (b) using precast RC pipe, 1000 D loading;
(5) 26 standard manholes, Type "B";
(6) 1 standard manhole, Type "B", with standard pressure manhole frame and cover;
(7) 1 standard junction chamber, Type "B";
(8) 100 cu. yd. standard conc. bed;
(9) 600 tons gravel bed;
(10) 1,860 lin. ft. 8-in. VC pipe sanitary sewer;
(11) 7 standard junction chambers, Type "A";
(12) 3 standard manholes, Type "A";
(13) 1 siphon struct.

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
(1)	(a)	17.83	17.60	18.75	19.31	19.75	.....	22.20	24.00
	(b)	.....	.....	.....	19.00	.....	19.80	.....	24.00
(2)	(a)	18.00	30.00	22.50	24.00	21.55	.....	25.59	34.00
	(b)	.....	.....	.....	23.50	.....	23.00	.....	34.00
(3)	(a)	16.00	18.50	18.50	21.50	20.00	.....	21.95	33.00
	(b)	.....	.....	.....	21.00	.....	21.50	.....	33.00
(4)	(a)	15.30	18.25	19.10	18.50	19.20	.....	21.08	30.00
	(b)	.....	.....	.....	18.25	.....	20.00	.....	30.00
(5)		550.00	300.00	350.00	750.00	500.00	450.00	542.00	500.00
(6)		650.00	400.00	500.00	900.00	800.00	470.00	565.00	750.00
(7)		600.00	350.00	400.00	800.00	525.00	460.00	548.00	750.00
(8)		12.00	15.00	25.00	15.00	15.00	14.00	24.70	25.00
(9)		3.00	3.00	4.00	4.00	4.00	3.00	3.09	5.00
(10)		3.00	3.00	3.50	2.50	3.50	3.50	1.87	3.50
(11)		160.00	185.00	250.00	175.00	200.00	180.00	212.00	250.00
(12)		180.00	175.00	260.00	175.00	225.00	175.00	170.00	250.00
(13)		$1,500	$1,200	$6,000	800.00	$2,000	$2,000	$1,235	$2,750

Highway and Street . . .

New Mexico—Grant County—State—Grade & Culverts

W. T. Bookout Construction Co., Las Vegas, was awarded the contract by the New Mexico State Highway Department at Santa Fe on the low bid of $530,293 to grade, minor drainage structures, seven multiple concrete box culverts each over 20-ft. clear span, water and rolling, levelling course, ballast and miscellaneous construction on 7.5 miles of the Silver City-Bayard road. Unit bids were received from the following:

(1) W. T. Bookout Construction Co. $530,293
(2) Skousen Construction Co. 591,865
(3) G. I. Martin 611,703
(4) Brown Bros. 651,772
(5) Armstrong & Armstrong $695,487
(6) Lowdermilk Bros. 700,798
(7) Henry Thygesen & Co. 714,795

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lump sum,	removal of old structures	600.00	$1,000	$1,000	$1,000	$1,000	$1,000	250.00
266,800	cu. yd. excavation, unclassified	.60	.95	.80	.98	1.10	.78	1.10
3,895	cu. yd. excavation for structures	3.00	2.00	3.00	2.00	3.00	5.00	3.00
810	cu. yd. excavation for pipe culverts	2.00	2.00	3.00	3.00	2.50	3.00	3.00
819,500	sta. yd. overhaul	.015	.035	.02	.03	.03	.02	.03
88,000	¼-mi. yd. haul	.05	.15	.06	.08	.06	.10	.08
2,615	hr. mechanical tamping	4.00	3.50	5.00	4.00	4.50	5.00	5.00
465	hr. rolling—sheepsfoot roller	4.00	4.00	5.00	5.00	4.00	6.00	4.00
910	hr. rolling—steel tired roller	5.00	5.00	5.00	6.00	5.00	7.00	5.00
57,280	ton ballast	.50	.52	.70	.85	.66	1.00	.78
33,940	ton leveling course	1.00	.85	.80	.92	.74	1.25	.82
2,915	M. gal. watering	2.20	1.00	3.00	3.00	4.00	4.50	3.50
5,364	cu. yd. Class "AE" concrete	30.00	23.50	32.00	27.00	32.00	37.50	31.00
722,969	lb. reinforcing steel	.075	.065	.07	.08	.07	.085	.09
82	cu. yd. wire enclosed riprap	10.00	8.00	4.00	6.00	6.00	15.00	5.00
3,300	lb. wire fabric for riprap	.15	.12	.20	.20	.12	.20	.15
6	ea. cattle guard—18-ft. roadway	$1,100	$1,200	900.00	$1,000	$1,200	$1,100	$1,000
2	ea. reinforced conc. monument and marker	50.00	50.00	50.00	50.00	50.00	50.00	50.00
73,350	lin. ft. galvanized barbed wire fence	.15	.13	.18	.15	.18	.18	.15
5	ea. gates (Texas type)	10.00	10.00	6.00	5.00	10.00	15.00	10.00
196	ea. bracing	4.00	2.00	3.00	3.00	4.50	15.00	5.00
111	ea. treated timber warning posts (reflect.)	8.00	10.00	8.00	7.00	7.00	7.00	10.00
69	ea. right-of-way markers	6.00	5.00	10.00	4.00	6.00	10.00	5.00
9,350	lin. ft. contour ditches	.12	.15	.10	.10	.20	.15	.30

(Continued on next page)

48	cu. yd. rock and wire check dams	14.00	8.00	20.00	12.00	15.00	20.00	8.00
1,148	lin. ft. stand. reinf. conc. culv. pipe, 24-in.						5.60	6.00
596	lin. ft. stand. reinf. conc. culv. pipe, 30-in.						7.50	7.00
744	lin. ft. stand. reinf. conc. culv. pipe, 36-in.						10.75	8.00
100	lin. ft. stand. reinf. conc. culv. pipe, 42-in.						15.00	10.00
388	lin. ft. stand. reinf. conc. culv. pipe, 48-in.						16.50	12.00
1,148	lin. ft. corr. galv. metal. culv. pipe, 24-in.	3.40	3.25	5.00	4.00	3.60	4.25	5.00
596	lin. ft. corr. galv. metal culv. pipe, 30-in.	4.50	4.00	6.00	4.60	4.50	5.00	5.50
744	lin. ft. corr. galv. metal culv. pipe, 36-in.	6.50	6.00	7.00	6.70	7.00	7.25	6.50
100	lin. ft. corr. galv. metal culv. pipe, 42-in.	7.50	7.00	9.00	7.70	8.00	9.75	7.50
388	lin. ft. corr. galv. metal culv. pipe, 48-in.	9.00	8.00	10.50	8.70	9.00	10.50	9.00

Arizona—Cochise County—State—Grade & Surf.

R. H. Martin, Contractor, Tucson, with a bid of $197,291, was low before the Arizona State Highway Department, Phoenix, for grading, draining, placing base material and bituminous surface treatment on the Douglas-Safford Highway. The work begins about 3½ miles east of Pearce and extends approximately 10¼ miles northwesterly. Unit bids follow:

(1) R. H. Martin Contractor.....$197,291
(2) W. R. Skousen..... 197,449
(3) Wallace & Wallace $216,079

		(1)	(2)	(3)
19,047	cu. yd. roadway excav. (unclassified)	.35	.40	.40
5,075	cu. yd. drainage excav. (unclassified)	.35	.40	.40
11,470	lin. ft. grader ditches	.05	.05	.05
336	cu. yd. structural excav. (unclassified)	2.50	2.50	2.50
14	cu. yd. removal of old conc.	20.00	20.00	15.00
13,100	sta. yd. overhaul	.02	.01	.02
54,009	ton imported borrow	.45	.45	.50
55,880	ton select material	.45	.47	.55
39,341	ton aggregate base	1.35	1.28	1.55
4,449	M. gal. sprinkling	1.50	2.00	2.00
1,582	hour rolling	5.50	6.00	5.50
80	hr. mechanical tamping	4.00	5.00	5.00
180	cu. yd. Class "A" conc. (including cement)	45.00	50.00	45.00
11,300	lb. reinforcing steel (bars)	.11	.12	.10
136	lin. ft. 24-in. corrugated metal pipe (CIP except excavation)	4.50	3.75	4.75
442	lin. ft. 36-in. corrugated metal pipe (CIP except excavation)	6.50	5.00	8.00
42	lin. ft. resetting 24-in. corr. metal pipe (CIP including all mtls. and work)	3.00	3.00	2.00
6	ea. cattle guards (2 unit) (CIP except excav. and conc.)	500.00	500.00	500.00
45,895	lin. ft. standard line fence	.15	.15	.13
4	ea. standard steel gates (Type 1)	75.00	50.00	40.00
13	ea. standard wire gates (Type 2)	15.00	25.00	15.00
13,820	lin. ft. reconstructing fence	.10	.10	.10
74	ea. guide posts (Std. A-1 or Special A-1a)	4.50	6.00	5.00
50	ea. right-of-way markers (Type "E")	6.00	6.00	6.00
3,260	lin. ft. constr. timber ford walls and rock baskets	6.50	6.25	6.00
440	ton road oil (SC-2) (for B.S.T.)	28.00	24.00	27.00
190	ton road oil (SC-6) (for B.S.T.)	30.00	29.00	32.00
1,360	ton blotter material	3.00	3.00	4.00

California—Fresno County—State—Grade & Pave.

Gunner Corporation & J. E. Haddock, Ltd., of Pasadena, with a bid of $778,949 were low before the California State Division of Highways on construction of about 6.5 miles of highway grading and paving with plant mix surfacing on cement treated base on Route 4, between one quarter mile south of Fowler and Calwa Overpass. The units bids were:

(1) Gunner Corporation & J. E. Haddock, Ltd. $778,949
(2) Basich Bros. Construction Co. & Basich Bros. $836,755
(3) Peter Kiewit Sons' Co. 896,229

		(1)	(2)	(3)
900	cu. yd. removing concrete	3.00	6.00	4.70
1,950	cu. yd. removing pavement	2.00	4.00	3.50
Lump sum,	clearing and grubbing	$7,000	$10,000	$26,000
51,000	cu. yd. roadway excavation	.50	.45	.50
1,200	cu. yd. ditch excavation	.80	1.50	1.00
5,950	cu. yd. structure excavation	1.50	2.50	1.50
270,000	sq. yd. compacting original ground	.05	.05	.05
150,000	cu. yd. imported borrow	.65	.95	.80
117,000	sq. yd. mixing and compt. (cem. tr. subgrade)	.18	.28	.45
20,500	bbl. Portland cem. (cem. tr. subgr. and cem. tr. base)	3.20	2.40	2.92
52,000	tons mineral aggregate (cem. tr. base)	3.30	3.20	2.36
Lump sum,	dev. water sup. and furn. watering equip.	$5,000	$10,000	$1,600
14,000	M. gals applying water	1.20	1.50	2.10
344	sta. finishing roadway	12.00	15.00	15.00
8,100	tons crusher run base	3.60	3.50	3.40
125	tons liquid asphalt, SC-2 (pr. ct.)	18.00	17.00	14.00
900	tons liquid asphalt, SC-4 (dense graded P.M.S.)	16.00	14.00	14.00
18,000	tons mineral agg. (dense graded P.M.S.)	3.60	3.00	4.00
4,500	tons mineral agg. (open graded P.M.S.)	3.70	3.60	5.00
880	tons paving asph. (open gr. P.M.S. and P.M.S. level crse.)	19.00	18.00	15.00
12,500	tons mineral agg. (P.M.S. leveling course)	3.50	3.00	4.40
475	tons asph. emul. (cur. sl., pt. bdr. and sl. ct.)	35.00	30.00	21.00
100	lin. ft. raised bars	1.00	1.50	1.00
855	cu. yd. Class "A" P.C.C. (struc.)	40.00	50.00	60.00
88,600	lbs. bar reinf. steel	.09	.08	.10
1,450	lbs. structural steel	.20	.25	.20
100	ea. expansive anchor bolts	2.30	1.00	3.00
110	lin. ft. rubber water stop	1.00	1.00	3.50
5	ea. handhole frames and covers	100.00	50.00	40.00
152	cu. yd. Class "A" P.C.C. (curbs)	30.00	30.00	50.00
110	ea. curb dowels	.50	.40	1.00
90	ea. monuments	5.00	6.00	5.00
90	lin. ft. laminated guard railing	3.00	5.00	2.00
31	ea. culvert markers	4.00	5.00	2.00
0.3	mi. new property fence	$1,500	$1,500	$1,500
1	mi. removing and reconst. exist. prop. fence	$1,100	600.00	$1,500
124	lin. ft. 12-in. R.C.P. (std. str.)	1.60	1.75	2.50
210	lin. ft. 18-in. R.C.P. (std. str.)	2.50	2.50	3.00
582	lin. ft. 24-in. R.C.P. (std. str.)	3.50	3.25	4.00
450	lin. ft. 12-in. Pl.C.P.	1.10	1.25	1.25
12	lin. ft. 14-in. Pl.C.P.	1.50	1.40	1.40
36	lin. ft. 16-in. Pl.C.P.	1.70	1.50	1.50
1,230	lin. ft. 20-in. Pl.C.P.	2.10	2.00	2.00
2,000	lin. ft. 24-in. Pl.C.P.	2.80	3.00	2.50
680	lin. ft. 26-in. x 6½-in. part circle C.M. clv. (8 gauge)	3.00	3.00	4.00
27	lin. ft. salvaging exist. pipe culverts	1.00	2.00	1.50
160	lin. ft. salvaging exist. part circle C.M. clv.	1.00	2.00	1.30
142	lin. ft. relaying salv. part circle C.M. clv.	1.00	2.00	1.30
65	ea. red reflectors	3.00	2.40	1.50
6	ea. removing and replanting palm trees	100.00	200.00	250.00
1,100	ea. 5-gal. size oleander (Mrs. F. Roeding variety)	2.70	3.40	3.50

(Continued on next page)

ANOTHER GREAT TRAXCAVATOR

REG. U. S. PAT. OFF.

Digs · Grades · Loads
Carries · Bulldozes
Backfills · Spreads
Casts · Levels · Strips

●

Digs Toughest Soils
Year-Around Utility
High Production
Low Yardage Costs
Complete Visibility
Fast, Easy Operation

HERE'S the newest member of the famous TRAXCAVATOR family, the Model T-6 — climax of 20 years of tractor-shovel building . . . Brings to excavating, dirt-moving and material-handling fields, a new measure of multi-purpose utility and low production costs.

It mounts on the "Caterpillar" D6 tractor and is engineered to utilize most efficiently the full power, speed and work capacity of that renowned tractor . . . over 16,000 pounds of tractive effort that digs full loads in toughest soils . . . quick reverse, unequalled visibility and sure-footed balance that spells high-speed, low-cost digging, loading, grading and moving of earth or loose materials . . . ability to load big hauling units or small dump trucks with equal ease.

TRAXCAVATORS are the only full and complete line of tractor-excavators . . . there's a size for every job and purpose . . . and both TRAXCAVATORS and tractors are sold and serviced by your TRACKSON-"Caterpillar" dealer. See him today about the T-6 and other sizes of TRAXCAVATORS, or write direct for facts to TRACKSON COMPANY, Dept. WC-37, Milwaukee 1, Wisconsin.

TRAXCAVATORS ARE PROFIT-MAKERS

2,063 ea. 1-gal. size oleander (single Watermelon Red variety)	1.20	2.00	1.15		
188 ea. locust trees	3.30	6.00	3.10		
18,010 ea. ice plant cuttings	.07	.07	.055		
Lump sum, removing and reconst. improvements (Loc. A)	$9,000	$13,500	$17,500		
Lump sum, removing and reconst. improvements (Loc. B)	$6,800	$5,200	$6,200		
Lump sum, removing and reconst. improvement (Loc. C)	$12,000	$13,000	$20,300		
Lump sum, removing and reconst. improvement (Loc. D)	$13,000	$12,900	$19,900		
Lump sum, removing and reconst. improvements (Loc. E)	$13,800	$22,000	$41,200		
Lump sum, removing and reconst. improvements (Loc. F)	$3,400	$2,300	$3,300		

Nevada—Nye County—State—Surf.

Dodge Construction, Inc., Fallon, with a bid of $184,932 was low bidder to the Nevada Department of Highways at Carson City for roadway excavation and base course surfacing of a portion of the State Highway System, Route 8A, Section B, from Round Mountain Junction to Millett's, a length of 21.6 miles. Unit bids follow:

(1) Dodge Construction, Inc. $184,932
(2) Hunt & Frandsen 191,304
(3) Nevada Constructors, Inc. 193,146
(4) Silver State Construction Co. $196,117
(5) D. Gerald Bing 226,336
(6) Isbell Construction Co. 239,330

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, signs	500.00	500.00	500.00	500.00	800.00	500.00
4,583 lin. ft. remove fence	.05	.07	.05	.10	.12	.10
137,190 cu. yd. roadway excavation	.33	.32	.30	.30	.45	.55
1,955 cu. yd. drainage excavation	.50	1.30	.40	.50	1.00	1.00
823 sta. V-type ditches	5.00	4.00	5.00	5.00	7.00	5.00
11,013 cu. yd. borrow	.33	.25	.30	.30	.45	.55
218,410 yd. sta. overhaul	.02	.02	.015	.02	.02	.015
8,465 yd. mi. overhaul	.20	.20	.20	.20	.25	.25
1,446 cu. yd. structure excavation	1.50	2.50	1.50	1.50	1.50	2.50
2,363 cu. yd. backfill	1.50	1.30	.90	1.00	1.50	1.50
5,971 M. gal. water	1.50	1.50	2.50	2.00	1.25	2.00
292 hr. power roller	4.75	7.00	6.00	5.00	6.00	6.00
497 hr. tamping roller	7.50	8.00	5.00	5.00	7.50	9.00
5,121 cu. yd. selected material surface	.63	.50	.55	.70	.80	.55
8,975 cu. yd. Type 1 gravel base	.67	.55	.95	.70	.80	.90
63,685 ton Type 2 gravel base (one inch size)	.75	.75	.80	.55	.90	.90
36 cu. yd. Class A concrete	50.00	65.00	80.00	50.00	80.00	60.00
25 cu. yd. Class B concrete	50.00	65.00	70.00	50.00	100.00	60.00
4,630 lb. reinforcing steel	.12	.20	.11	.15	.20	.10
152 lin. ft. 8-in. corrugated metal pipe (dipped)	2.00	1.50	1.50	1.50	1.50	1.50
1,356 lin. ft. 24-in. corrugated metal pipe (dipped)	4.00	4.50	4.50	4.50	4.00	3.75
312 lin. ft. 30-in. corrugated metal pipe (dipped)	5.00	6.00	5.50	6.00	5.00	5.25
384 lin. ft. 36-in. corrugated metal pipe (dipped)	7.50	8.00	8.00	8.00	7.50	8.00
278 lin. ft. 21½-in. x 13½-in. corr. metal arch pipe (dipped)	3.25	3.25	3.10	2.50	3.00	3.00
1,854 lin. ft. 30-in. x 17-in. corr. metal arch pipe	4.25	5.00	4.75	5.00	4.20	4.50
344 lin. ft. 37-in. x 21-in. corr. metal arch pipe	5.25	6.00	6.00	6.00	5.20	6.00
478 lin. ft. 44-in. x 25-in. corr. metal arch pipe	8.00	7.50	8.50	8.00	7.50	8.50
75 cu. yd. drain backfill	5.00	2.50	3.00	1.50	4.00	10.00
326 cu. yd. grouted hand-laid riprap	15.00	25.00	20.00	20.00	30.00	25.00
3,378 lin. ft. construct fence	.20	.20	.20	.30	.25	.30
2,307 lin. ft. reconstruct fence	.20	.10	.13	.30	.20	.25
2 ea. 16-ft. metal gates	62.50	50.00	65.00	50.00	100.00	35.00
89 ea. monuments	6.00	5.00	5.00	5.00	10.00	6.00
52 ea. 24-in. standard metal headwalls	47.50	50.00	50.00	50.00	50.00	42.00
14 ea. 30-in. standard metal headwalls	67.50	80.00	75.00	100.00	75.00	62.00
14 ea. 36-in. standard metal headwalls	110.00	150.00	150.00	125.00	125.00	122.00
6 ea. 21½-in. x 13½-in. standard metal headwalls	32.50	30.00	28.00	30.00	40.00	24.00
76 ea. 30-in. x 17-in. standard metal headwalls	45.00	45.00	43.00	50.00	50.00	38.00
16 ea. 37-in. x 21-in. standard meal headwalls	57.50	60.00	57.75	70.00	70.00	52.00
12 ea. 44-in. x 25-in. standard metal headwalls	92.50	115.00	105.00	100.00	100.00	97.00
1,054 lin. ft. 2-in. standard steel pipe	1.00	1.00	.40	.50	1.50	1.00
214 lin. ft. 3-in. standard steel pipe	2.00	1.50	.70	100.00	2.50	1.75
Lump sum, adjust pipe line	25.00	100.00	50.00	500.00	100.00	100.00

Wyoming—Uinta County—State—Grade & Surf.

Peter Kiewit Sons' Co., Sheridan, was awarded the contract on the low bid of $455,716 to the Wyoming State Highway Department, Cheyenne, for grading, draining, 2-R.C. culverts, base course, plant mixed surface course and miscellaneous work on 9.6 miles of the Utah State Line-Evanston road and the Evanston-Granger Junction road. Unit bids were received from the following:

(1) Peter Kiewit Sons' Co. $455,716
(2) W. W. Clyde & Co. 467,506
(3) Northwestern Engineering Co. $490,570
(4) Inland Construction Co. 403,971

	(1)	(2)	(3)	(4)
434,000 cu. yd. excavation	.20	.28	.27	.25
42,000 cu. yd. sta. overhaul	.015	.015	.015	.015
73,000 cu. yd. mi. haul	.20	.18	.18	.14
7,200 M. gal. watering (emb.)	2.40	1.50	2.00	2.40
2,300 hr. sheepsfoot roller operation	3.00	2.50	3.50	3.10
46 lin. ft. 15-in. C.M.P.	5.00	3.50	4.00	3.55
259 lin. ft. 18-in. C.M.P.	4.00	3.00	3.55	3.25
1,219 lin. ft. 24-in. C.M.P.	5.50	3.85	4.50	4.30
393 lin. ft. 30-in. C.M.P.	7.00	5.00	6.00	5.70
479 lin. ft. 36-in. C.M.P.	10.00	7.20	9.00	8.70
252 lin. ft. 42-in. C.M.P.	10.00	8.20	9.00	9.50
688 lin. ft. 48-in. C.M.P.	13.00	9.60	12.00	12.75
49 lin. ft. 18-in. x 11-in. C.M.P. Arch Culvert	3.00	2.20	2.75	2.90
880 cu. yd. excavation for pipe culverts	2.00	1.50	2.00	2.10
340 cu. yd. structure excavation	2.50	2.50	2.50	2.40
590 hr. mechanical tamping	6.00	4.00	6.00	4.50
80 cu. yd. Class I riprap	7.00	6.00	6.00	14.00
50 cu. yd. grouted riprap	12.00	12.00	10.00	18.00
137,000 ton, crushed gravel base course (2-in. max.)	.70	.82	.85	.86
26,900 ton crushed gravel base course (1-in. max.)	.85	.90	.90	.91
19,100 ton plant mixed surface course	3.00	2.75	3.25	3.80
1,250 ton stone chips	6.00	3.50	4.50	4.17
3,320 M. gal. watering (base)	2.50	1.50	2.00	2.40
1,310 hr. roller operation (base)	5.00	5.00	5.00	4.80
435 ton base treatment MC-0	35.00	25.00	27.50	32.90
1,248 ton bituminous material (Gr. 120-150)	25.00	22.50	23.00	27.90
19,200 lin. ft. shaping and tamping curb	.25	.15	.16	.07
800 lin. ft. shaping and tamping spillway	.50	.20	1.00	.35
52,500 lin. ft. standard r/w fence	.14	.14	.12	.12
6,100 lin. ft. removing and resetting r/w fence	.10	.14	.12	.10
50 ea. end panels	13.00	10.20	8.50	14.00
80 ea. brace panels	10.00	9.00	7.50	11.00
300 ea. fence posts	1.00	.85	.90	1.10
400 rod barbed wire	.10	.13	.10	.14
600 ea. wire stays	.10	.10	.10	.06
35,240 lb. reinforcing steel	.10	.10	.10	.10

(Continued on next page)

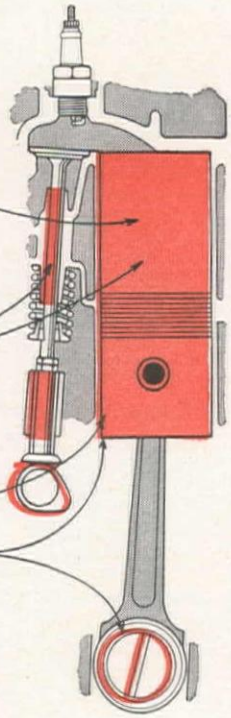
STANDARD ENGINEERS NOTEBOOK

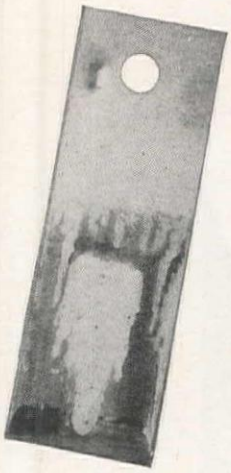
① Adhering agent in RPM Compounded Motor Oil keeps oil film on all parts after engine stops, even on cylinder walls.

② Rustproofing compounds prevent moisture that condenses on cooling parts from contacting metal.

③ No rust is formed to scrape off when engine starts, and cause excessive wear.

④ Constant lubricant film provides adequate and instant lubrication when engine starts.





This actual photograph shows how one HIGH-QUALITY MOTOR OIL "peeled" off almost all of this test strip of steel when it was placed in corrosive-moisture conditions similar to those in a cooling engine. The oil concentrated at one spot and the unprotected surface quickly rusted.

RPM COMPOUNDED MOTOR OIL kept this strip bright and shiny, completely sealed against rusting, when it was exposed to the same conditions. "RPM" compounds keep a constant rust-proofing lubricant film on engine parts at all times, whether they are idle or moving.

How RPM Motor Oil Rust-Proofs As It Lubricates

Rusting, caused by corrosive moisture, is the greatest source of wear in automotive engines (85%, according to some engineers). It can be controlled by using RPM Compounded Motor Oil.

Additional compounding for "RPM," perfected by Standard of California scientists, provides a rust-proofing lubricant film on internal engine surfaces. The heaviest moisture condensation in idle or cold-running engines will not cut through it.

Other compounds in RPM Motor Oil give it adherent qualities so the film stays on parts at all times. They also loosen and remove gum and lacquer, lubricate hot spots, resist sludge formation, bearing corrosion and stop foaming.

Trademark "RPM" Reg. U. S. Pat. Off.

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

FOR EVERY NEED A STANDARD OF CALIFORNIA JOB-PROVED PRODUCT

374.3 cu. yd. Class AA concrete	40.00	47.00	41.00	40.00
68 ea. right-of-way markers	20.00	8.00	7.50	11.00
6 ea. rein. conc. project markers	30.00	20.00	20.00	21.00
3.8 mi. old road obliteration	400.00	300.00	200.00	275.00
Lump sum removing existing structures	$1,000	500.00	$1,500	$1,650
1.3 mi. detour obliteration	200.00	200.00	200.00	210.00
376 ton bituminous material for seal coat (Gr. 120-150)	33.00	26.00	25.50	33.40

Oregon—Gilliam County—State—Grade & Pave.

E. C. Hall Co., Portland, with a bid of $148,069 was low to the Oregon State Highway Commission, Salem, for grading and oil mat surfacing on the Hay Creek-Condon Section of the Wasco-Heppner Highway. Unit bids follow:

(1) E. C. Hall Co. $148,069
(2) Babler Bros. 156,957
(3) O. C. Yocom Co. 161,951
(4) Vernie Jarl $166,766
(5) Natt McDougall Co. 208,804
(6) Sound Construction & Engineering Co. 212,666

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, clearing and grubbing	$3,000	$5,000	$1,000	$2,000	$3,000	$2,500
200 cu. yd. structural excavation, unclassified	2.50	3.00	4.00	3.00	3.50	4.00
100 cu. yd. trench excavation, unclassified	2.50	3.00	2.00	2.00	3.50	4.00
92,000 cu. yd. general excavation, unclassified	.35	.50	.50	.68	.93	.90
168,000 yd. sta. short overhaul	.02	.02	.02	.02	.02	.015
4,500 yd. sta. long overhaul	.40	.50	.50	.50	.60	.60
5.83 mi. finishing roadbed and slopes	500.00	400.00	500.00	500.00	620.00	650.00
130 lin. ft. 12-in. cor. metal pipe	2.50	2.00	2.25	2.50	2.25	3.35
1,050 lin. ft. 18-in. cor. metal pipe	3.50	3.00	3.25	3.00	3.30	3.50
110 lin. ft. 36-in. cor. metal pipe	8.50	9.00	8.00	7.50	8.70	9.50
420 lin. ft. salvaging culvert pipe	2.50	2.00	2.00	1.00	3.50	1.75
23,200 cu. yd. 1½-in. - 0-in. rock in base	2.30	2.15	2.45	2.00	2.50	2.75
5,500 cu. yd. ¾-in. - 0-in. rock in lev. crse. and shldrs.	2.30	2.20	2.45	2.20	2.50	2.75
700 M. gal. sprinkling	3.00	3.50	2.85	3.00	3.15	3.00
5.83 mi. preparation of base	200.00	200.00	200.00	200.00	265.00	200.00
720 cu. yd. ¾-in. - 0-in. rock in binder course	4.30	3.20	3.50	3.75	3.70	3.75
2,300 cu. yd. furn. and place aggregates	4.05	3.20	3.50	3.50	3.80	3.75
110 tons furn. and place RC-3 asph. in binder crse.	33.00	35.00	32.50	32.00	34.00	35.00
130 tons furn. and place 151-200 asph.	35.00	35.00	32.50	32.00	35.00	37.00
74 tons furn. and place RC-3 or emul. asph. in seal coat	33.00	35.00	32.50	32.00	34.00	35.00
1,120 cu. yd. ¾-in. - ½-in. crush rock in stockpile	2.30	2.25	2.30	2.30	2.25	2.60
870 cu. yd. ½-in. - ¼-in. cr. rock in stockpile	2.30	2.25	2.30	2.30	2.25	2.60
510 cu. yd. ¼-in. - 0-in. cr. rock in stockpile	2.30	2.25	2.30	2.00	2.25	2.60

Montana—Missoula County—State—Grade & Surf.

Chas. Shannon & Son, Butte, was awarded the contract, subject to P.R.A. concurrence, on the low bid of $257,302 to the Montana State Highway Commission, Helena, for grading, surface and roadmix oiling of 4.4 miles of the Bonita West Section of the Mullen Road. Date of completion is Aug. 15, 1947. The following unit bids were submitted:

(1) Chas. Shannon & Son $257,302
(2) Clifton & Applegate 265,355
(3) McLaughlin, Inc. 272,293
(4) C. & F. Trucking & Contracting Co. $273,976
(5) Morrison-Knudsen Co., Inc. 299,872

	(1)	(2)	(3)	(4)	(5)
161,068 cu. yd. unclass. excav. and borrow	.72	.70	.68	.74	1.00
1,267 cu. yd. culvert excavation	1.00	3.00	2.00	1.50	2.50
29,521 cu. yd. select borrow base course	.72	.90	1.01	.90	.75
153,840 sta. yd. overhaul	.01	.02	.02	.02	.02
18,068 mi. yd. overhaul	.30	.20	.30	.20	.19
28,489 ton base course surf. Gr. C-2	.92	1.10	1.10	1.00	1.05
16,814 ton Type A top course Gr. A	1.45	1.25	1.35	1.50	1.05
1,400 cu. yd. binder	.01	.01	.25	.10	.50
2,800 mi. yd. overhaul on binder	.01	.01	.25	.10	.12
500 unit rolling embankment	8.00	5.00	7.00	6.00	5.50
210 unit rolling surface courses	8.50	6.00	7.00	5.00	5.50
2,500 M. gal. watering	.75	1.00	2.00	2.00	1.90
88,107 gal. appl. SC-4 asph. road oil	.11	.14	.12	.15	.11
4.451 mile processing	$1,095	900.00	$1,000	$1,000	$1,100
267 sq. yd. processing approaches	.60	.40	.50	.40	.30
108 lin. ft. 15-in. rein. conc. pipe cul.	4.00	3.30	3.50	2.50	2.50
99 lin. ft. 18-in rein. conc pipe cul.	5.00	4.15	4.00	3.00	3.75
300 lin. ft. 24-in. rein. conc. pipe cul.	6.75	5.00	6.00	5.00	5.50
76 lin. ft. 60-in. rein. conc. pipe cul.	35.00	28.75	20.00	20.00	25.00
276 lin. ft. 18-in. corr. met. siphon pipe	6.70	3.50	3.00	3.00	3.50
312 lin. ft. 24-in. corr. met. siphon pipe	7.80	5.00	4.00	4.50	5.10
368 lin. ft. 30-in. corr. met. siphon pipe	8.80	6.20	5.50	6.00	6.35
98 lin. ft. 36-in. corr. met. siphon pipe	10.80	8.75	8.00	9.00	9.35
4.31 cu. yd. Class B concrete	68.00	80.00	60.00	60.00	55.00
7,710 lin. ft. steel guard rail	2.20	3.10	3.00	3.00	2.20
2 ea. conc. project markers	25.00	20.00	15.00	10.00	14.00
31 ea. conc. right-of-way monuments	6.00	5.00	4.00	5.00	4.50
23 ea. conc. station markers	8.00	8.00	8.00	5.00	7.50
1,007 ton stkpl. stone ch. Gr. B	6.00	5.00	8.00	5.00	6.25
700 ton stockpiled gravel	1.45	.95	1.35	1.50	1.75

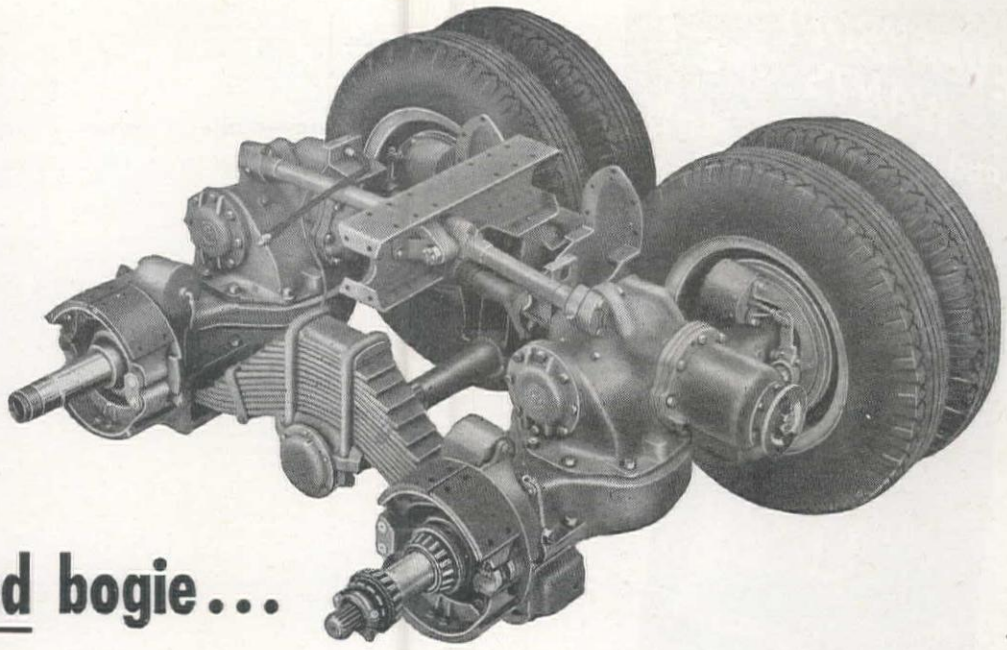
California—Orange County—State—Widen & Surf.

Griffith Co., Los Angeles, submitted the low bid of $241,258 to the California Division of Highways at Sacramento for about 11.2 miles of widening and plant mix surfacing and bituminous surface treatment to be applied to shoulders, on Harbor Boulevard, between Wilson Street in Costa Mesa and Manchester Ave. south of Anaheim. The following unit bids were submitted:

(1) Griffith Co. $241,258
(2) Arthur A. Johnson 265,238
(3) Sully Miller Contracting Co. 268,873
(4) Vido Kovacevich Co. $285,388
(5) Cox Bros. Construction Co. 309,747

	(1)	(2)	(3)	(4)	(5)
50 cu. yd. rem. conc.	10.90	3.00	15.00	12.50	12.50
589 sta. clearing and grubbing	12.00	6.00	15.00	20.00	18.00
40,000 cu. yd. roadway excav.	.56	.80	.85	.65	1.20
7,600 cu. yd. imported borrow	1.00	1.80	.85	1.10	1.25
Lump sum, dev. water sup. and furn. watering equip.	$1,600	$1,000	500.00	750.00	$5,300
1,900 M. gals. applying water	1.45	2.00	2.00	2.25	1.80
589 sta. finishing roadway	7.36	10.00	3.00	7.00	8.50
19,700 tons untreated rock base	1.96	1.70	2.35	2.15	1.95
79,000 sq. yd. prep. mix. and shaping surf. (bit. surf. tr.)	.07	.08	.11	.15	.145
960 tons liquid asphalt SC-2 (bit. surf. tr.)	12.25	13.00	12.50	15.00	12.25
37,000 tons P.M.S.	3.54	3.90	3.60	4.00	4.10
85 tons liquid asphalt SC-2 (prime coat)	18.75	16.00	18.00	25.00	13.50
40 tons asphaltic paint binder	37.70	30.00	28.00	45.00	65.00
12 ea. guide posts	5.00	5.00	5.00	5.00	5.00
448 lin. ft. 12-in. C.M.P. (16 gauge)	1.70	2.50	2.60	2.50	2.50
118 lin. ft. 15-in. C.M.P. (16 gauge)	2.25	2.60	4.00	3.25	3.30
66 lin. ft. 18-in. C.M.P. (16 gauge)	2.60	2.75	4.50	4.75	4.00

(Continued on next page)



Here is a truly balanced bogie...

It's the Mack bogie . . . specially designed by Mack engineers . . . built only in Mack factories. Because of perfected balancing it handles big loads over bad ground in an outstanding manner.

This bogie assures equal traction, even tire loading, and uniform braking regardless of road conditions. Weight transfer is virtually eliminated, as is hopping and rearing. It embodies self-steering qualities. Wheels roll freely on turns without scuffing or wheel-fight.

Three built-in Mack exclusives are among the important advantages of this bogie: the Power Divider which transfers driving power to the wheels having the best traction . . . rubber Shock Insulators which make twisting of springs impossible . . . and the low trunnion position which aids in canceling weight transfer.

Thanks to its simple, robust construction and balanced stress distribution, maintenance is greatly reduced.

The Mack bogie is a typical example of the way Mack designs and builds trucks down to basic working parts to meet specific job demands.

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

MOUNTAINS OF CEMENT have been mixed and moved by Mack trucks working for **Readymix Concrete Co., Ltd., San Francisco** over the past 11 years. Six yards each is their load every trip. Multiply this by 11 years of service with negligible repair lay-out and you get a good idea of the tonnage profit a Mack rolls up.

142 lin. ft. 24-in. C.M.P. (14 gauge)	3.85	3.25	5.50	6.00	4.75
14 lin. ft. 21½-in. x 13½-in. C.M. arch pipe (16 gauge)	5.15	5.00	5.00	5.50	5.50
148 lin. ft. jacking 24-in. C.M.P. (14 ga.) thru R.R. embankmt.	12.50	5.00	25.00	22.00	36.00
937 lin. ft. salv. exist. pipe culverts	.80	2.00	2.00	1.50	1.40
573 lin. ft. relaying salv. C.M.P. culverts	.80	2.00	2.50	2.50	1.60
3 ea. adj. manholes to grade	12.00	25.00	25.00	15.00	25.00

Montana—Valley County—State—Grade & Surf.

Northwestern Engineering Co., Rapid City, S. Dak., was awarded the contract on the low bid of $246,828 to the Montana State Highway Commission, Helena, for 21.8 miles of grading and surfacing of the Glasgow-Opheim road. Unit bids follow:

(1) Northwestern Engineering Co. $246,828
(2) Inland Construction Co. 248,439
(3) Albert Lalonde Co. 252,177
(4) O'Neil Construction Co. $270,069
(5) Morrison-Knudsen Co., Inc. 284,158

	(1)	(2)	(3)	(4)	(5)
387,166 cu. yd. unclass. excav. and borrow	.24	.238	.23	.28	.30
1,576 cu. yd. culvert excavation	1.75	.95	2.00	2.00	2.00
454,100 sta. yd. overhaul	.015	.03	.02	.02	.02
91,366 ton Type B top co., Grade BB	1.18	1.20	1.25	1.25	1.35
2,700 cu. yd. binder	.50	.44	.50	.10	.25
5,400 mi. yd. overhaul on binder	.25	.16	.10	.20	.15
902 lin. ft. 18-in. corr. met. pipe culv.	3.00	2.66	3.50	3.50	3.00
2,188 lin. ft. 24-in. corr. met. pipe culv.	4.00	3.80	5.00	4.00	4.00
52 lin. ft. 30-in. corr. met. pipe culv.	6.00	5.00	6.50	7.00	5.00
372 lin. ft. 36-in. corr. met. pipe culv.	7.50	7.24	8.50	10.00	8.00
168 lin. ft. 48-in. corr. met. pipe culv.	10.00	9.77	11.50	12.00	10.00
115 lin. ft .75-in. sec. pl. pipe culv., 7 ga.	55.00	34.15	45.00	50.00	30.00
52.5 lin. ft. 90-in. sec. pl. pipe culv., 7 ga.	65.00	41.60	55.00	60.00	35.00
168 lin. ft. relaying met. pipe culv.	2.00	2.58	2.00	5.00	2.00
91 cu. yd. gravel backfill material	2.00	4.52	4.00	3.00	2.00
676 sq. yd. grouted riprap	7.00	6.97	6.00	5.00	10.00
2 ea. concrete proj. markers	20.00	20.00	15.00	15.00	14.00
84 ea. concrete right-of-way monuments	8.00	6.50	5.00	10.00	4.50
1,600 ton stock piled gravel	1.18	1.20	1.25	1.00	1.00

Bay Crossing

(Continued from page 102)

any possibility of future expansion to include railroads, and construction of the trestle-tube-fill type is more flexible as to future needs than is any other type; it would result in overall appreciation rather than depreciation of real property, and would permit of earlier completion.

No provision was made in the report for immediate introduction of transcontinental passenger train service into San Francisco proper, but expansion of the southern crossing could provide this service later, the board said, with an approximate doubling in construction costs.

At the present time there are four facilities for crossing the bay. The Dumbarton Toll Bridge, 30 mi. south of the Ferry Building; the San Mateo Toll Bridge, 22 mi. south of the Ferry Building; the San Francisco-Oakland Bay Bridge, ¼-mi. south of the Ferry Building, and the ferries. When the present bridge was built, it was thought that one-third of the traffic would be autos, and two-thirds would be interurban trains. In 1940, however, 65 per cent of the traffic was automobiles, and in 1946 75 per cent was automobiles. The number of vehicles has increased by 90 per cent since 1940. Critical capacity of the existing bridge under present operating conditions is 4,000 vehicles per hour (three lanes each way). Over two million vehicles per month now cross the bay. One hundred and fifty train cars and 200 buses are in operation with a capacity of 50,000,000 persons per year.

A new parallel crossing either north or south of the present bridge would attract about 25 per cent of traffic, it is estimated. In the case of a north crossing, the difference in mileage would be only 1/10 of a mile and 3/10 of a minute in travel time. In the case of a southern crossing, the difference in distance would be 3/10 of a mile and also 3/10 of a minute in travel time.

Conclusive points

The board concluded that the solution to the bay crossing transportation problem should be that plan which will provide for the greatest benefit to the entire Bay area considered as an economic entity and which will give reasonable protection to the national interests.

It was also their conclusion that an additional crossing for any type of traffic is not necessary at this time from the standpoint of national defense, but that additional crossing facilities for automobile traffic are desirable now and will be necessary from the standpoint of the peacetime economy by the time another crossing can be provided.

They decided the best solution to the cross-bay transportation problem in its entirety is a plan combining the existing bridge, a second vehicular crossing and a system of rapid mass transportation, including a tube. The immediate solution would provide for vehicular traffic only.

Additional interurban railroad facilities are not necessary at this time. The next crossing should not include main line railroads.

The board also decided that the Hunter's Point to Bay Farm Island didn't solve the problem, and that a continuous low-level bridge with a draw or lift span located northerly of Hunter's Point is definitely objectionable. They also concluded that the Reber plan would dislocate industry, and that the central business district could not absorb more traffic. After study, they decided that none of the terminal areas in San Francisco offers a street pattern that could absorb more than 4 additional lanes of cross-bay traffic in each direction.

The board then proposed a 6-lane open causeway-tube with a 4-lane extension under the Oakland Estuary to the proposed East Shore Freeway. This would be complemented in San Francisco by a freeway bringing cross-bay traffic from the crossing to and beyond the railroad tracks south of Townsend St.

CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than $10,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information: County of job location (capital letters); name and address of contractor (bold face); bid price; brief description of work; awarding agency; and approximate date of award. More detailed information on many of these projects is often available, and will gladly be furnished upon your request to the Editor, WESTERN CONSTRUCTION NEWS, 503 Market Street, San Francisco.

CONTRACTS AWARDED

Large Western Projects . . .

Bechtel Bros. of San Francisco Calif., and **H. C. Price,** Bartlesville, Okla., were awarded a contract by the Trans-Arabian Pipe Line Co., San Francisco, for the construction of 600 miles of main oil line and pump stations at eastern end of Trans-Arabian pipeline. **Williams Bros. Corp.** of Tulsa, Okla., will construct about 450 miles of main line at the western end of the pipeline and also build the Mediterranean tanker loading terminal. The cost of the entire project is estimated to be $100,000,000.

Texas Bitulithic Co., of Dallas, Tex., received $940,500 to improve various streets in Dallas. The City Council of Dallas made the award.

Morrison-Knudsen Co., Inc., Boise, Ida., reseived a contract in the amount of $1,779,258 for general tank construction in the 631 sq. mi. area in Benton Co., Wash. Hanford Engineering Works, Richland, Wash., awarded the contract.

Kuckenberg Construction Co., Portland, Ore., was awarded the $986,993 contract to improve S.W. Harbor Drive approaches to Barbur Blvd. and Ross Island bridge in Portland, Ore. The Oregon State Highway Commission at Salem made the award.

Waale Camplan Co. & Smith, Inc., Los Angeles, Calif., will build a steel frame factory bldg. for the American Radiator & Standard Sanitary Corp. of Pittsburgh, Pa., in Torrance, Calif., for $1,750,000.

J. A. Terteling & Sons of Boise, Ida., has been awarded a contract for $875,759 for the construction of lateral systems, earthwork and structures on the Conchas Canal and laterals, Tucumcari Project, New Mexico. Award given by Bureau of Reclamation at Tucumcari.

DePuy & DePuy, San Antonio, Tex., received $884,396 from the City Council of Corpus Christi for the construction of two storm sewer projects in Corpus Christi, Tex.

Gibbs & Hudson, Inc., Seattle, Wash., will build for themselves a $1,800,000 apartment hotel building at 7th and Spring Sts., Seattle.

Cahill Bros., San Francisco, received the contract at $935,000 from the Pacific Gas & Electric Co. of San Francisco for the construction of a 13-story office building in San Francisco, Calif.

W. J. Henson, Phoenix, was given a contract amounting to $480,000 to improve a portion of the Prescott-Ashfork Hwy. in Arizona by the State Highway Department at Phoenix.

Bechtel Corp., Los Angeles, Calif., will build a flour mill and grain elevator in Vernon, Calif., for General Mills, Inc., Sperry Division, Minneapolis, Minn., for $1,000,000.

W. D. Zavalas, Oroville, Calif., received $348,700 to clear Cascade Reservoir site, in Valley Co., Idaho. Bureau of Reclamation at Boise awarded the contract.

Gus. J. Bouten Construction Co., Spokane, Wash., received $950,000 from the Sacred Heart Hospital in Spokane for the construction of building additions to the hospital.

Vinnell Company of Alhambra, Calif., was awarded a $1,500,000 contract by the Weston Biscuit Co., Passaic, N. J., to convert aircraft plant to bakery plant in Burbank, Calif.

V. D. Case Co., Long Beach, Calif., received $496,873 for earthwork, lining and structures on portion of Yuma-Mesa Project in

Arizona. Bureau of Reclamation at Yuma made the award.

L. P. Reed, Meridian, Tex., will construct paved landing strip at Camp Hood, Bell County, Tex., for U. S. District Engineer, Galveston. Amount of award is $1,968,658.

Allison Honer Co., Santa Ana, received a contract at $816,318 to construct school buildings at 17th and Bristol Sts., Santa Ana, Calif., for the City Board of Education.

Fisher & McNulty, Fresno, will build for the Pacific Telephone & Telegraph Co., San Francisco, a $560,000 5-story exchange building in Fresno, Calif.

U. S. Pipe & Foundry Co. of San Francisco received $552,280 to furnish cement enameline-lined C.I. pipe to the City of Phoenix, Ariz.

P. C. Sorenson Co., Dallas, Tex., was awarded a $1,634,152 contract by the Dallas City Council for the construction of interceptor sewer and trunk sewer extensions in Dallas.

J. E. Haddock, Ltd., Pasadena, Calif., received $592,913 for 3.4 miles of hwy. improvement in Ventura County, Calif. The Division of Highways at Sacramento made the award.

Highway and Street . . .

Arizona

MARICOPA CO.—**Wallace & Wallace,** Box 470, Phoenix—$264,851 for 6.3 mi. grade, base and surf. of Phoenix-Rock Springs Hwy., beginning 17 mi. N. of Grand Ave., Thomas Rd. & Mission Dr. intersection to 5.5 mi. S. of New River—by State Highway Department, Phoenix. 2-7

YAVAPAI CO.—**W. J. Henson,** 115 S. Grant St., Phoenix—$480,005 for approx. 7.5 mi. grade and surf. of Prescott-Ashfork Hwy., from 1¾ mi. S. of hwy. junction of U. S. Hwy. 66 with U. S. Hwy. 89, near Ashfork extending S.—by State Highway Department, Phoenix. 2-25

YUMA CO.—**Packard Contracting Co.,** Luhrs Tower, Phoenix—$164,683 for 3.5 mi. grade and surf. from 28 mi. E. of Yuma toward Wellton—by State Highway Department, Phoenix. 2-25

California

IMPERIAL CO.—**R. E. Hazard Construction Co.,** 2548 Kettner Blvd., San Diego—$317,620 for 1.2 mi. grade, pave and surf. on 4th St. and Adams Ave., betw. Main St. and Imperial Ave., El Centro—by Division of Highways, Sacramento. 2-7

LOS ANGELES CO.—**Fred D. Chadwick,** 4325 Brewster Ave., Lynwood—$336,071 for grade, pave and constr. of bridge approaches, lift span bridge over Cerritos channel, Terminal Island—by Bureau of Yards & Docks, Washington, D. C. 2-7

LOS ANGELES CO.—**Heuser & Garnett,** 816 Allen Ave., Glendale—$43,106 to improve sts. in Arvilla Ave. and Stagg St. Improvement District, Los Angeles—by City Board of Public Works, Los Angeles. 2-7

LOS ANGELES CO.—**T. E. Sherlock,** 1103 W. 40th Pl., Los Angeles—$24,957 to improve Washington Blvd., from E. city limits to Union Pacific Railroad underpass, Vernon—by County Board of Supervisors, Los Angeles. 2-7

MONTEREY CO.—**Granite Construction Co.,** Box 900, Watsonville—$13,386 to pave and grade from N. line of Decatur St. to Alvarado St. and Lighthouse Rd., Monterey—by City Council, Monterey. 2-6

NEVADA CO.—**Westbrook & Pope,** Rt. 9, Box 841, Sacramento—$318,864 for 2.5 mi. hwy. constr., Nevada City-Downieville, Tahoe National Forest—by Public Roads Administration, San Francisco. 2-14

ORANGE CO.—**Cox Bros. Construction Co.,** Box 36, Stanton—$256,060 for 4.9 mi. grade and surf. betw. Laguna Beach and Dana Point—by Division of Highways, Sacramento. 2-7

SAN DIEGO CO.—**Clifford C. Bong & Co.,** 6 N. 1st Ave., Arcadia—$113,813 for 1.5 mi. grade and surf. betw. Santa Ysabel and Julian—by Division of Highways, Sacramento. 2-25

SAN FRANCISCO CO.—**Charles L. Harney,** 575 Berry St., San Francisco—$33,803 to improve St. Joseph's Ave., betw. Turk and O'Farrell Sts., and improve O'Farrell St., betw. St. Joseph's Ave. and Broderick St., San Francisco—by City and County Department of Public Works, San Francisco. 2-28

VENTURA CO.—**J. E. Haddock, Ltd.,** 3538 E. Foothill Blvd., Pasadena—$592,913 for 3.4 mi. of grade, P.C.C. pave and plant-

mix surf., betw. Montalvo and Ventura—by Division of Highways, Sacramento. 2-7

Colorado

MOFFAT AND RIO BLANCO COS.—**Gardner & Eskgridge,** Glenwood Springs—$229,445 for 11.1 mi. gravel surf. of State Hwy. No. 2—by State Highway Department, Denver. 2-14

Kansas

PRATT CO.—**L. W. Rexroad & Son,** Salina—$79,143 for 10.5 mi. grade—by State Highway Commission, Topeka. 2-1

Oregon

CLATSOP CO.—**Leonard & Slate Oreg., Ltd.,** 7805 S.W. 40th Ave., Portland—$291,473 for .9 mi. grade, bitum. macadam surf. and furn. rock in stockpiles on Circle Bridge-Summit Section of Oregon Coast Hwy.—by State Highway Commission, Salem. 2-4

UNION CO.—**La Grande Concrete Pipe Co.,** La Grande—$12,145 for rock production work on Old Oregon Trail—by State Highway Commission, Salem. 2-21

WASHINGTON AND YAMHILL COS.—**O. C. Yocom,** 920 S.E. 11th St., McMinnville—$103,736 for 7.9 mi. of surf. and oiling of Scholls-Newberg Section of Hillsboro-Silverton Sec. Hwy.—by State Highway Commission, Salem. 2-4

Texas

BROWN CO.—**Hunter Strain,** Box 1057, San Angelo—$10,161 for 13.6 mi. seal coat from Brownwood to State Park Rd. 15—by State Highway Department, Austin. 2-6

COLEMAN CO.—**A. L. Bucy,** 804 Ave. 1, Brownwood—$79,625 for 3.3 mi. grade, flex. base and surf. from U. S. Hwy. 67 to U. S. Hwy. 84, S. of Coleman—by State Highway Department, Austin. 2-6

DALLAS CO.—**City Construction Co.,** 4711 Livingston St., Dallas—$14,845 for drainage improvements, Lemon Ave., betw. Knight Branch and Rober St., Dallas—by City Council, Dallas. 2-17

DALLAS AND ELLIS COS.—**Grafe-Callahan Construction Co.,** 2034 Amelia St., Dallas—$121,497 for 15.4 mi. hot mix asph. conc. pave from .9 mi. N. of Dallas-Ellis Co. line to N. city limits of Ennis—by State Highway Department, Austin. 2-6

DALLAS CO.—**Texas Bitulithic Co.,** Box 5297, Dallas—$940,500 for .9 mi. grade, struct., conc. pave, and storm sewers from slightly N. of Ross Ave. to Haskell Ave., Dallas—by City Council, Dallas. 2-19

EASTLAND, PALO PINTO AND STEPHENS COS.—**D. & H. Construction Co.,** Rt. 5, Box 160-B, Dallas—$21,975 for 23.7 mi. seal coat and single asph. surf. from Morton Valley to Ranger, from Stephens Co. line to Possum Kingdom Park, from Caddo to Palo Pinto Co. line—by State Highway Department, Austin. 2-6

ERATH AND SOMERVELL COS.—**D. & H. Construction Co.,** Rt. 5, Box 160-B, Dallas—$11,950 for 17.9 mi. seal coat and 1.7 mi. surf. near Somervell—by State Highway Department, Austin. 2-6

FISHER CO.—**Fred Bell,** Rt. 2, Abilene—$35,377 for 5 mi. grade, base and surf. from Rotan-W.—by State Highway Department, Austin. 2-18

HALE AND FLOYD COS. — **Stone & Falls,** Box 96, Ada, Okla.—$109,372 for 14.2 mi. grade, structs., base and surf. from Petersburg to intersection of Hwy. 207 on Rd. 54—by State Highway Department, Austin. 2-19

HEMPHILL CO. — **Ernest Loyd,** Box 1120, Fort Worth—$120,744 for 10.7 mi. flex. base and hot mix asph. conc. pave. on Hwy. 170 to Okla. State line—by State Highway Department, Austin. 2-6

HUNT CO. — **Texas Bitulithic Co.,** Box 5297, Dallas—$29,157 for 1.7 mi. hot mix asph. conc. pave in Greenville—by State Highway Department, Austin. 2-6

HUTCHINSON CO. — **Bell & Braden,** Herring Hotel, Amarillo—$100,742 for 10.4 mi. asph. conc. pave from Borger to Carson Co. line—by State Highway Department, Austin. 2-6

JACK CO. — **Brazos Valley Construction Co.,** Majestic Bldg., Fort Worth—$96,589 for 6.5 mi. grade, structs., base and asph. surf. from approx. 5.3 mi. No. of Hwy. 24 to Clay Co. line—by State Highway Department, Austin. 2-18

LIVE OAK CO.—**Killian-House Co.,** Box 1081, San Antonio—$250,608 for 10.5 mi. grade, flex. base, conc. pave and surf. on shoulders from Atascosa Co. line to junction of State Hwy. 9, N. of Three Rivers—by State Highway Department, Austin. 2-6

MONTAGUE CO.—**Shilling Bros., C. & W. S. Crawford Co.,** 4817 Montrose Dr., Dallas—$315,901 for 11.5 mi. grade, base and double asph. surf.—by State Highway Department, Austin. 2-19

SAN SABA CO. — **Holland Page,** Box 1181, Austin—$20,290 for 21.1 mi. seal coat from Richland Springs to San Saba to Mills Co. line—by State Highway Department, Austin. 2-6

TAHOKA CO.—**Kerr & Middleton,** Lubbock—$105,051 for 14.2 mi. grade, drain structs., pave, from Wilson-E.—by County Commission, Tahoka.

TARRANT CO. — **Texas Bitulithic Co.,** Box 5343, Dallas—$30,217 to pave Roberts and McPherson Sts., Fort Worth—by City Council, Fort Worth. 2-24

TERRY CO. — **Ernest Loyd,** Box 1120, Fort Worth and **Ned B. Hoffman,** Mid-Continent Bldg., Fort Worth—$118,404 for 18.9 mi. grade, base and surf. from U. S. Hwy. 62 to Lynn Co. line and from Hockley Co. line E. of Sundown to Hwy. 51—by State Highway Department, Austin. 2-18

TRAVIS CO.—**McKown & Sons,** Box 151, Austin—$158,318 for 4.2 mi. grade, base and surf. from 45th St., Austin to Paytons Gin — by State Highway Department, Austin. 2-6

WEBB CO.—**M. E. Worrell & Shilling Bros.,** Rt. 5, Box 20, Austin—$231,741 for 22 mi. grade and struct., from Laredo City limits-E.—by State Highway Department, Austin. 2-19

Utah

CACHE CO.—**Olof Nelson Construction Co.,** Box 413, Logan—$225,329 for 1.1 mi. grade and drain on U. S. 91, betw. Box Elder Co. line and Wellsville—by State Road Commission, Salt Lake City. 2-12

EMERY AND GRAND COS.—**Whiting & Haymond,** Springville—$135,765 for 3.7 mi. 2½ in. road mix bitum. surf. of U. S. Hwys. 6 and 50, betw. Green River and Solitude Wash—by State Road Commission, Salt Lake City. 2-12

MILLARD CO. — **Bethers Bros.,** Heber City—$103,033 for 4.3 mi. bitum. surf. of U. S. Hwy. 6, betw. Hinckley and Nevada line — by State Road Commission, Salt Lake City. 2-12

Washington

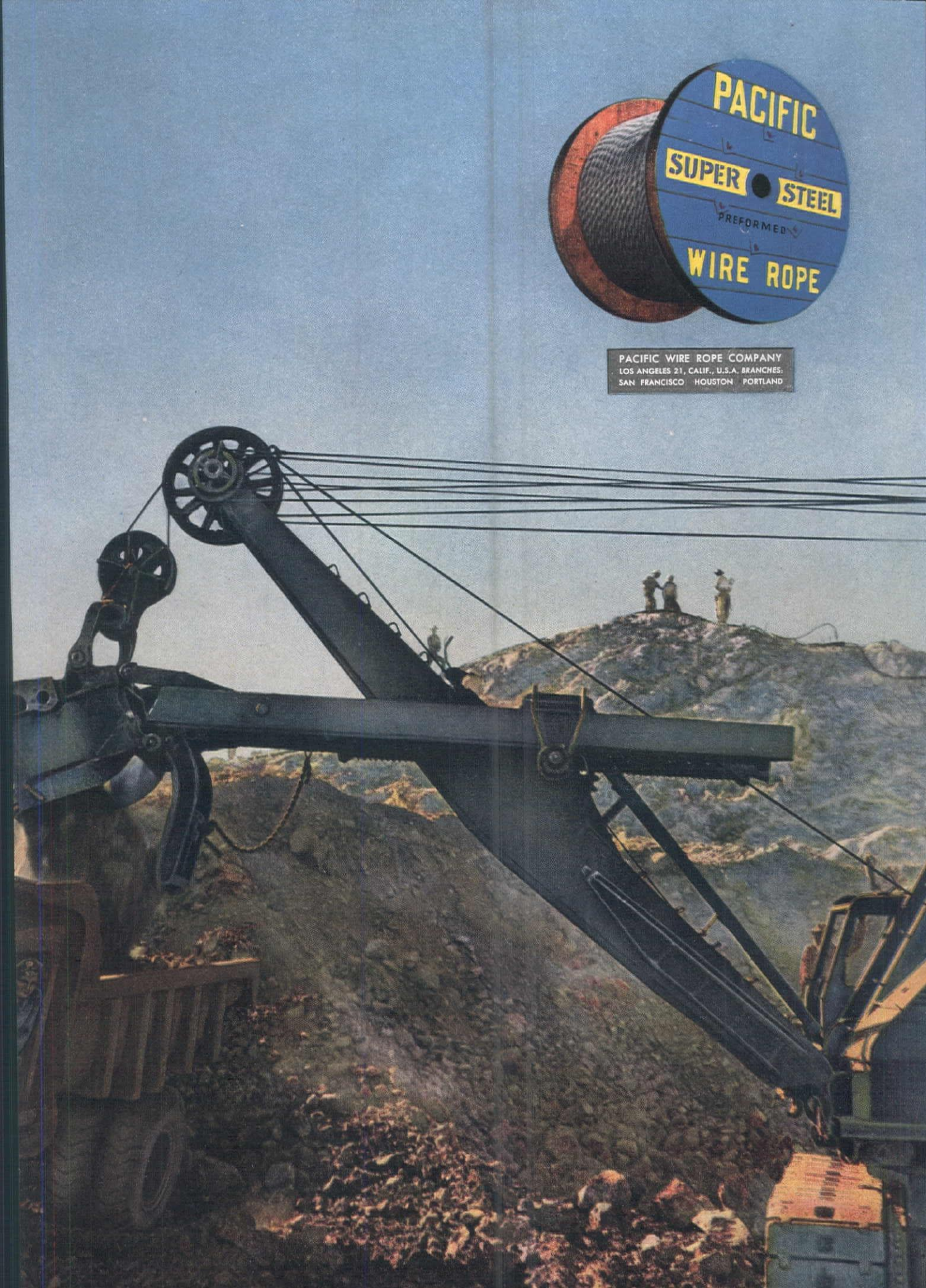
BENTON CO. — **C. & E. Construction Co.,** Yakima—$25,000 to improve sts. and alleys in Kennewick — by City Council, Kennewick. 2-11

CHELAN CO.—**Goodfellow Bros., Inc.,** Wenatchee—$151,839 on .7 mi. S. State Hwy. 10-D, clear, grub, grade and surf., from Chelan River-N.—by Department of Highways, Olympia. 2-12

COWLITZ CO. — **Erickson Paving Co., Inc.,** 1550 N. 34th St., Seattle—$216,263 for 1.1 mi. clear, grub, grade of P. State Hwy. 1, betw. Longview Wye and Davis Terraces —by Department of Highways, Olympia. 2-19

GRAYS HARBOR AND JEFFERSON COS. — **Peter Kiewit Sons' Co.,** Omaha Natl. Bank Bldg., Omaha, Neb.—$37,162 for 5.3 mi. surf. and stock pile on P. State Hwy. 9, betw. Queets and Clearwater Rd. —by Department of Highways, Olympia. 2-24

GRAYS HARBOR AND PACIFIC COS. — **Quigg Bros. Construction Co.,** Hoquiam—$184,013 to surf. and stockpiling on P. State Hwy. 13, betw. Grays Harbor


PACIFIC
SUPER STEEL
PREFORMED
WIRE ROPE
PACIFIC WIRE ROPE COMPANY
LOS ANGELES 21, CALIF., U.S.A. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

Co. line to Smith Creek—by Department of Highways, Olympia. 2-6

KITTITAS CO.—**L. J. Dowell, Inc.,** 1437 Elliott Ave., West, Seattle—$26,384 for .9 mi. clear, grub, grade, surf. on S. State Hwy. 7-BN, near Ellensburg—by Department of Highways, Olympia. 2-19

LINCOLN CO.—**D. A. Whitley, Estate,** 1325 N. Division St., Spokane—$79,925 for 13 mi. surf. on S. State Hwy. 4-B, from Wilbur S.—by Department of Highways, Olympia. 2-6

SKAGIT CO.—**Lige Dickson Co.,** 3115 S. Pine St., Tacoma—$67,870 for 3.4 mi. surf. of Bayview-Edison Rd.—by Department of Highways, Olympia. 2-6

Bridge . . .

Arizona

COCONINO CO.—**H. L. Royden,** Box 3707, Phoenix—$159,924 for constr. of reinf. conc. overpass and approaches on Flagstaff-Winslow Hwy., approx. 7 mi. E. of Flagstaff—by State Highway Department, Phoenix. 2-7

California

MARIN CO.—**Parish Bros.,** Box 6, Benicia—$234,826 for constr. of undercrossing on Linden Lane under Northwestern Pacific Railway tracks and the freeway in San Rafael—by Division of Highways, Sacramento. 2-21

SHASTA CO. — **James I. Barnes Construction Co.,** Russ Bldg., San Francisco—$317,106 for constr. of substruct. for bridge across Sacramento River, Redding — by Division of Highways, Sacramento. 2-28

Colorado

BOULDER CO.—**C. L. Hubner Co.,** 4000 York St., Denver—$79,783 for .5 mi. surf. and bridge constr. on State Hwy. 1, betw. Longmont and Lafayette—by State Highway Department, Denver. 2-1

LARIMER CO.—**Edw. Selander,** 2309 S. Federal Blvd., Denver—$207,286 to widen 2 bridges betw. Fort Collins and Loveland —by State Highway Department, Denver. 2-12

OTERO CO. — **Brown Construction Co.,** 1322 E. Willamette, Colorado Springs — $210,329 to constr. conc. and steel bridge, surf. approaches and constr. underpass drain system on State Hwy. 6, W. of Swink — by State Highway Department, Denver. 2-1

OTERO CO.—**John De Angelo,** Florence —$20,698 to constr. bridge and approaches on State Hwy. 6, betw. Manzanola and Fowler—by State Highway Department, Denver. 2-7

OTERO CO. — **Lindstrom & Williams,** 4138 Galapago St., Denver—$80,357 for constr. of conc. and steel girder bridge, remove old bridge and 2,600 sq. yd. conc. pavement, and surf. .2 mi. of State Hwy. 6, betw. La Junta and Swink—by State Highway Department, Denver. 2-1

PUEBLO CO. — **John DeAngelo,** Florence—$29,209 for .2 mi. widen bridge on State Hwy. 6, betw. Pueblo and Canon City — by State Highway Department, Denver. 2-1

Oklahoma

GREER CO.—**Stebbins Construction Co.,** Box 1498, Tulsa—$137,173 to raise steel truss bridge approx. 14 ft. and reconstr. and surf. bridge approaches on State Hwy. 9 near Granite—by Bureau of Reclamation, Washington, D. C. 2-11

Oregon

MULTNOMAH CO.—**Kuckenberg Construction Co.,** Box 949, Rt. 7, Portland—$986,993 to improve S.W. Harbor Dr. approaches to Barbur Blvd. and Ross Island Bridge, and widen W. end of bridge, Portland — by State Highway Commission, Salem. 2-8

Utah

BEAVER CO.—**Palfreyman Construction Co.,** Box 672, Provo—$70,301 for 2.4 mi. bitum. surf. and constr. of conc. bridge on State Rd. 21, betw. Milford and Nevada line—by State Road Commission, Salt Lake City. 2-12

EMERY AND GRAND COS. — **T. G. Rowland,** 1568 S. 11th East, Salt Lake City —$61,455 for constr. of conc. and steel bridge superstructure on U. S. Hwy. 50, E. of Green River—by State Road Commission, Salt Lake City. 2-12

Washington

FRANKLIN CO.—**Don L. Cooney, Inc.,** 1749 Airport Way, Seattle — $26,685 for constr. of conc. overcrossing over railroad —by Department of Highways, Olympia. 2-6

KING CO.—**N. Fiorito Co.,** 844 W. 48th

t., Seattle—$302,740 for constr. of conc. ers and abutments of railway bridge and 9 mi. grade and surf. of State Hwy. 2-A, Lennydale to Bellevue—by Department of Highways, Olympia. 2-1

LICKITAT CO.—**David Nygren,** Lloyd ldg., Seattle—$40,062 for .4 mi. clear, rub, grade and surf. and constr. reinf. onc. girder bridge over Rattlesnake Creek n S. State Hwy. 8-D, Husum Vicinity xtension—by Department of Highways, lympia. 2-24

IERCE CO. — **Harrison Bros. Co.,** 225 Vakefield Dr., Tacoma — $199,299 for onstr. of reinf. conc. slab bridge and 4.1 i. pave on P. State Hwy. 5—by Depart- ent of Highways, Olympia. 2-7

KAGIT CO.—**A. W. Stevens Construc- on Co.,** 711 2nd St., Mt. Vernon—$41,610 r constr. of steel and reinf. conc. deck idge over Rocky Creek—by Department f Highways, Olympia. 2-6

AHKIAKUM CO.—**M. P. Butler,** 3419 th Ave. S.W., Seattle — $193,017 for onstr. of conc. and steel Rosburg Bridge— Department of Highways, Olympia. 2-1

HATCOM CO.—**C. B. Croy,** 3081 Lake- ay Dr., Bellingham—$22,295 for constr. conc. bridge over Schmidt Creek, Austin ass branch of P. State Hwy. 1—by De- artment of Highways, Olympia. 2-6

HATCOM CO.—**Northwest Construc- on Co.,** 3950 6th N.W., Seattle—$147,146 r constr. of reinf. conc. slab bridge and ade and surf. approaches, Weiser Lake idge — by Department of Highways, lympia. 2-6

Airport . . .

Texas

ELL CO.—**L. P. Reed,** Meridian—$1,- 8,658 for constr. of paved landing strip at amp Hood—by District Engineer, Gal- eston. 2-10

Water Supply . . .

Arizona

ARICOPA CO.—**Arizona Sand & Rock** o., Box 596, Phoenix—$224,821 to install 4-in. water feeder line in Osborn Rd., hoenix—by City Council, Phoenix. 2-7

ARICOPA CO. — **Fisher Contracting** o., Box 4035, Phoenix—$247,002 to install 5-in. and 20-in. water feeder lines, Phoenix -by City Council, Phoenix. 2-7

ARICOPA CO.—**U. S. Pipe & Foundry** o., Monadnock Bldg., San Francisco, alif.—$552,280 to furn. class 150 cement ameline-lined C. I. pipe, Phoenix — by ity Council, Phoenix. 2-3

ARICOPA CO.—**J. H. Welsh & Son,** 13 S. Central, Phoenix—$11,310 to install 2-in. and 6-in. C. I. pipe water mains, etc., 15th and other sts., Phoenix—by City ouncil, Phoenix. 2-7

California

LAMEDA CO.—**Steel Tank & Pipe Co.,** 100 4th St., Berkeley—$110,255 to furn. 3,000 lin. ft. cement-lined and coated steel ipe for property, betw. 73rd Ave. and 98th ve., near San Leandro Blvd., Oakland— y East Bay Municipal Utility District, Oakland. 2-25

RESNO CO.—**Pacific Pipeline & Engi-**

neers, Ltd., 3000 Railroad Ave., Fresno—$14,489 to install steel pipe water mains Fresno—by City Council, Fresno. 2

LOS ANGELES CO.—**Grinnell Co. of t Pacific,** 601 Brannan St., San Francisco—$124,154 to furn. copper water tubing, L Angeles—by Board of Commissioners Water & Power Department, Los Angel 2-

SACRAMENTO CO. — **Tom L. Gog** 10024 S. Figueroa St., Los Angeles—$6 200 to furn. and install 24-in. steel wat main in R St., betw. 51st and 45th, and 49th St., betw. R St. and 5th Ave., Sacr mento—by City Council, Sacramento. 2

SAN BERNARDINO CO. — **Fillmo Pipe Co.,** 563 Santa Clara, Fillmore—$ 856 to install pipe and for conc. work Mohave River Fish Hatchery—by Depa ment of Natural Resources, Sacrament 2

SAN MATEO CO.—**B. Miles Thoma** 2817 Scott St., San Francisco—$2,635 install water mains, Charter St., Redwo City—by City Council, Redwood City. 2

SANTA CLARA CO.—**Harvey E. Conn** 1222 Whipple Ave., Redwood City—$43,7 to install water and gas supply lines Palo Alto—by City Council, Palo Alto. 2-

Oregon

COLUMBIA CO.—**Zuber Bros. Concre Co.,** 637 S.E. Water St., Portland—$15,0 for constr. of 250,000 gal. conc. reservo chlorinator house and appurtenant wor Scappoose—by City Council, Scappoose 2

LANE CO.—**Allis-Chalmers Manufactu ing Co.,** Portland—$132,845 to supply 225 rpm. generator for Leaburg Pow plant, Eugene — by City Water Boar Eugene. 2

MULTNOMAH CO.—**E. E. Settergre** Henry Bldg., Portland—$85,328 for cons of 3 reinf. conc. reservoirs and 2 conc. pum houses, Portland—by Home Water Di trict, Portland. 2

Texas

BURNET CO.—**Roy Mitchell,** Shrevepo —$37,920 for conc. reservoir and to insta mains and pumps in Burnet—by City Cou cil, Burnet. 2-

DALLAS CO.—**E. L. Dalton Constru tion Co.,** Box 7125, Dallas—$28,204 to i stall water mains in Pecan Heights a Orchard Hill Additions, Dallas—by Ci Council, Dallas. 2-

KNOX CO.—**Clouse Brothers,** Kerrville $15,975 for pump room, pump connectio and water well, Knox City—by City Cou cil, Knox City. 2-

LYNN CO. — **Clovis Contracting C** Clovis, N. Mex.—$31,038 for water storag and pump facilities, Tahoka—by City Cou cil, Tahoka. 2-

Sewerage . . .

California

ALAMEDA CO.—**Paris Bros.,** 2415 Or gon St., Berkeley—$65,445 to install sewe in Railroad Ave., 98th Ave. and right-o way from 85th Ave. to Stone St., Oaklan —by City Council, Oakland. 2-

FRESNO CO.—**A. E. Downer Co.,** 305 Weber Ave., Stockton—$99,940 to insta

anitary sewers in various sections of resno—by City Council, Fresno. 2-25

RESNO CO. — **Kovick Bros. Construction Co.**, 145 W. Shields St., Fresno—$35,-04 to install conc. pipe sanitary sewers in ections of Oakwood St., College View, lackstone Terr., Fresno—by City Council, resno. 2-7

OS ANGELES CO. — **Robert Vlacich,** 314 Carlyle Place, Los Angeles—$26,303 o install sewers in Elmer Ave.-Spring ane Sewer District, Los Angeles — by ity Board of Public Works, Los Angeles. 2-14

OS ANGELES CO.—**R. A. Wattson,** 528 Vineland Ave., North Hollywood—$15,746 to install 8-in. to 12-in. vit. clay ewer pipe for approx. 12.8 mi. in Arcadia -by City Council, Arcadia. 2-7

IVERSIDE CO. — **Pernel Barnett,** 747 V. Chapman, Orange—$40,420 to constr. ewage treatment plant in Perris—by City ouncil, Perris. 2-14

AN DIEGO CO.—**V. R. Dennis Construction Co.,** Box 'F', Hillcrest Sta., San iego—$168,632 to install sewers in Alambra Park and other sts., San Diego—by ity Council, San Diego. 2-21

AN DIEGO CO.—**M. H. Golden,** 3485 oel St., San Diego—$20,000 for constr. of ewage treatment plant bldg. at 24th and ay Blvd., National City—by Vanderberg acking Co., National City. 2-21

AN DIEGO CO.—**M. V. Hutchison,** 8949 lpine St., La Mesa — $74,990 for constr. f 2 pumping stations and East side trunk ewer, La Mesa—by City Council, La lesa. 2-21

AN FRANCISCO CO.—**Associate Engineers,** 981 Folsom St., San Francisco—$19,-80 to install water supply lines at Golden ate Park sewage treatment plant, San rancisco—by City and County Park Commission, San Francisco. 2-7

AN JOAQUIN CO.—**Warren A. Webber,** 906 S. Lee St., Lodi — $46,632 for onstr. of outfall sewer units 2 and 3, betw. isting sewage disposal plant on Kettleman Lane and Western Pacific tracks, odi—by City Council, Lodi. 2-21

ANTA CLARA CO. — **A. J. Peters & on,** 410 10th St., San Jose—$42,364 to inall vit. clay sewer pipe and brick manoles in 8th St., betw. San Salvador and eyes Sts., San Jose—by City Council, an Jose. 2-19

Montana

ASCADE CO. — **Steve Yeleca,** Great alls—$2,402 to constr. 8-in. sanitary ewer in Second Alley, betw. 11th and 12th ts., Great Falls—by City Council, Great alls. 2-11

Texas

LAY CO. — **J. W. Roberson & Son,** ringtown—$36,119 for constr. of sewage eatment plant in Henrietta — by City ouncil, Henrietta. 1-31

ALLAS CO. — **P. C. Sorenson Co.,** outhland Life Bldg., Dallas—$1,634,152 r constr. of municipal interceptor sewer d trunk sewer extensions, Dallas — by ty Council, Dallas. 2-17

RAYSON CO.—**L. W. Wentzel,** Sherman—$78,431 for constr. of sewer disposal ant, Sherman—by City Council, Sherman. 2-21

IDALGO CO. — **Mitchell Darby Construction Co.,** Pharr—$179,239 for sewer ant and line improvements in Edinburg—

by City Council, Edinburg. 1-30

LAMB CO. — **Enix Construction Co.,** Houston—$66,650 for constr. of sewage disposal plant and sewer system in Olton —by City Council, Olton. 1-31

NUECES CO. — **DePuy & DePuy,** San Antonio—$884,396 for two storm sewer projects in Corpus Christi—by City Council, Corpus Christi. 1-30

Washington

KING CO.—**Henry Finch,** Seattle—$97,946 for constr. of sewer outfall extension, Washington St., Seattle—by City Board of Public Works, Seattle. 2-4

PIERCE CO. — **Industrial Engineers & Contractors, Inc.,** 711 Middle Waterway, Tacoma—$45,847 for constr. of extension to outfall sewer, Tacoma—by City Council, Tacoma. 2-12

Waterway . . .

California

BUTTE CO.—**Excavators, Inc.,** Box 790, Pittsburg—$302,330 for levee constr. on W. levee of Feather River from Rio Bonito Station to 3.5 mi. N.—by U. S. Engineer Office, Sacramento. 2-27

Washington

KING CO. — **General Construction Co.,** 3840 Iowa St., Seattle—$15,000 for constr. of bulkhead for dock at 2832 W. Florida St., Seattle—by West Coast Wood Preserving Co., Seattle. 2-12

SNOHOMISH CO.—**Goetz & Brennan,** Seaboard Bldg., Seattle—$27,900 for constr. of training levee on Skykomish River near Monroe—by U. S. Engineer Office, Seattle. 2-1

Dam . . .

Idaho

VALLEY CO.—**W. D. Zavalas,** Oroville, Calif.—$348,700 to clear Cascade Reservoir site, on N. fork of Payette River, 9 to 17 mi. N. of Cascade—by Bureau of Reclamation, Boise. 2-

Wyoming

CARBON CO.—**Morrison-Knudsen Co. Inc.,** Box 450, Boise, Ida.—$240,000 to remove 80,000 cu. yd. of rock debris from Kortes dam project approx. 60 mi. SW. of Casper—by Bureau of Reclamation, Washington, D. C. 2-1

Irrigation . . .

Arizona

YUMA CO.—**V. D. Case Co.,** 850 E. Ocean Blvd., Long Beach, Calif.—$496,873 for earthwork, lining and structs., laterals from A and B canal, and complete farm deliveries from A canal, Unit 1, SE. of Yuma—by Bureau of Reclamation, Yuma. 2-

New Mexico

QUAY CO.—**J. A. Terteling & Sons,** Box 1428, Boise, Ida.—$875,759 for structs, lateral sys., unit 2, earthwk. and structs, lateral units 3 and 4, and Conchas Canal sta. 3348 plus 17 to sta. 3517 plus 70, near Tucumcari—by Bureau of Reclamation, Tucumcari. 2-2

Oregon

JEFFERSON CO. — **Adler Construction Co.,** Box 1429, Medford — $165,300 for constr. of laterals and sublaterals near Madras and 7 mi. S., Deschutes Proj.—by Bureau of Reclamation, Bend. 2-1

Tunnel . . .

Montana

FLATHEAD CO.—**Arthur Benson,** Columbia Falls; **J. F. Douglas & Frank Bissell,** Coram—$16,928 for 2 exploration tunnels at Hungry Horse damsite on S. fork of Flathead River, approx. 6 mi. S. of Coram—by Bureau of Reclamation, Kalispel 2-1

Power . . .

California

LOS ANGELES CO. — **Elliott Co.** Jeanett, Pa.—$85,340 to furn. and instal steam condenser in power plant, Burbank —by City Council, Burbank. 2-1

Utah

GARFIELD AND WAYNE COS. — **W. E. Thatcher,** 17th & Jackson, Ogden—$60,600 for constr. of Hatch and Wayne City power plants—by Garkane Power Association. 2-1

Building . . .

California

ALAMEDA CO.—**Robert D. Bardell,** 1728 Market St., Oakland—$100,000 to remodel and enlarge department store bldg., Hobart & Franklin Sts., Oakland—by Lindburg's, Oakland. 2-3

ALAMEDA CO.—**M & K Corp.,** Financial Center Bldg., San Francisco—$105,000 for constr. of one-story, conc. addition to plant, 9957 Medford Ave., Oakland—by Denisons Foods, Oakland. 2-7

ALAMEDA CO.—**N. H. Sjoberg & Son,** 5604 E. 16th St., Oakland — $420,000 for constr. of steel frame, addition to telephone exchange bldg., 479 45th St., Oakland—by Pacific Telephone & Telegraph Co., San Francisco. 2-19

ALAMEDA CO.—**C. H. Thrams,** 1100 6th Ave., Oakland—$350,000 to remodel interior and exterior of 4-story bldg. for medical offices, Hobart & Webster Sts., Oakland—by Abraham & Harry N. Penn, Oakland. 2-19

ALAMEDA CO.—**C. H. Thrams,** 1100 6th Ave., Oakland—$40,133 for constr. of addition to freight bldg., 7th and Fallon Sts., Oakland — by Southern Pacific Co., San Francisco. 2-25

ALAMEDA CO.—**Valory & Wilson,** 2134 Parker St., Berkeley—$100,000 for constr. of 2-story, struct. steel, U-shaped addition to church bldg., at Dana and Channing, Berkeley—by Board of Management, First Presbyterian Church, Berkeley. 2-26

CONTRA COSTA CO.—**E. S. McKittrick Co.,** 610 16th St., Oakland—$108,000 for constr. of 3 motor transport bldgs. at Standard Oil Refinery, Richmond — by Standard Oil Co., San Francisco. 2-21

FRESNO CO.—**Fisher & McNulty,** Fulton Bldg., Fresno—$560,000 for constr. of 5-story and basement, steel frame, brick wall, telephone exchange bldg., at 1455 Van Ness Ave., Fresno—by Pacific Telephone & Telegraph Co., San Francisco. 2-19

FRESNO CO.—**Harris Construction Co.,** Box 109, Fresno—$60,200 for constr. of classroom bldg. at site of Orange Cove School—by City Joint School District, Orange Cove. 2-4

LOS ANGELES CO.—**Ray V. Anderson,** 9312 Monte Mar Dr., Los Angeles—$100,000 for constr. of one and part 2-story, frame and stucco church bldg., 7th and Los Angeles Sts., Montebello—by First Baptist Church, Montebello. 2-7

LOS ANGELES CO. — **Bechtel Corp.,** 3780 Wilshire Blvd., Los Angeles—$1,000,000 for constr. of 6 and part 7-story, reinf. conc. flour mill and grain elevator, 4309 Fruitvale Ave., Vernon—by General Mills, Inc., Sperry Division, Minneapolis, Minn. 2-24

LOS ANGELES CO. — **C. E. DeWitt,** 11379 San Fernando Rd., San Fernando—$200,000 for constr. of 3-story, reinf. brick warehouse at 8920 Lankershim Blvd., Roscoe—by Roscoe Hardware Co., Roscoe. 2-24

LOS ANGELES CO.—**Louis F. Geisler Co.,** 9637 California Ave., South Gate—$101,164 for constr. of one-story, frame and stucco addition to school bldg., Toluca Lake Elementary School, North Hollywood—by County Board of Education, Los Angeles. 2-21

LOS ANGELES CO.—**George Goedhart,** 1884 Woodlyn Rd., Pasadena—$123,750 to alter existing bldg. and constr. frame classroom addition to school at 1603 So. Marguerita Ave., Alhambra — by Alhambra City School District, Alhambra. 2-24

LOS ANGELES CO.—**Macdonald Engineering Co.,** 526 Folsom St., San Francisco —$120,000 for constr. of 109 ft. high, reinf. conc. glass materials batch mix plant, 7507 Roseberry Ave., Los Angeles—by Latchford Marble Glass Co., Los Angeles. 2-24

LOS ANGELES CO. — **Ben F. Marron,** 1525 E. Wardlow Rd., Long Beach—$118,000 for constr. of 2-story, 21-unit, frame and stucco apartment bldg. at Wardlow Rd. and Gaviota Ave., Long Beach—by self. 2-21

LOS ANGELES CO. — **Morrison-Knudsen Co., Inc.,** Title Guarantee Bldg., Los Angeles—$235,850 for constr. of rigid steel frame, one-story boiler shop bldg. at El Segundo Refinery—by Standard Oil Co., Los Angeles. 2-21

LOS ANGELES CO.—**Harvey A. Nichols Co.,** 936 E. Slauson Ave., Los Angeles —$100,000 for constr. of 5-story, reinf. conc. addition to storage bldg. at 3016 Wilshire Blvd., Santa Monica—by Bekins Van & Storage Co., Santa Monica. 2-21

LOS ANGELES CO.—**Oppert & Forsberg,** 1446 W. 186th St., Gardena—$108,642, general contract, for constr. of frame and stucco, 8-classroom school bldg. at 25902 Eshelman Ave., Lomita — by Los Angeles Board of Education, Los Angeles. 2-3

LOS ANGELES CO.—**C. L. Peck,** H. W. Hellman Bldg., Los Angeles—$2,000,000 for constr. of 3-story, reinf. conc. bakery plant, Ferguson Dr., betw. Vail and Naples Aves., Montebello—by Helms Bakeries, Los Angeles. 2-27

LOS ANGELES CO.—**Ryder-Nelson Co.,** 1036 Ridgeley Dr., Los Angeles—$200,000 for constr. of 2-story, steel frame and conc. addition to telephone bldg. at 1615 N. Lake Ave., Pasadena — by Southern California Telephone Co., Los Angeles. 2-21

LOS ANGELES CO.—**Vinnell Company,** 1145 Westminster Ave., Alhambra — $1,500,000 to convert old Lockheed-Vega plant bldgs. to bakery bldgs., 923 San Fernando Rd., Burbank—by Weston Biscuit Co., Passaic, N. J. 2-25

LOS ANGELES CO. — **Waale Camplan Co. & Smith Inc.,** 1670 Beverly Blvd., Los Angeles—$1,750,000 for constr. of steel frame and conc. factory bldg., Crenshaw Blvd. and 203rd St., Torrance—by American Radiator & Standard Sanitary Corp., Pittsburgh, Pa. 2-18

LOS ANGELES CO. — **P. A. Weeger,** 4565 Santa Monica Blvd., Los Angeles—$156,500 for constr. of frame and stucco kindergarten bldg., 4-classroom bldg., and cafeteria bldg., 911 E. Clarence St., San Gabriel—by San Gabriel School District, San Gabriel. 2-24

MERCED CO. — **Berlinger Construction Co., Inc.,** Box 716, Chico — $50,000 for constr. of 2 reinf. conc. and steel storage tanks and warehouse, 16th and J Sts., Merced—by Poultry Producers of California, Merced. 2-24

MERCED CO.—**Harris Construction Co.,** Box 109, Fresno—$43,000 for constr. of reinf. conc. sales and service bldg., 17th and 'O' Sts., Merced—by Montgomery Farms, Merced. 2-27

NAPA CO.—**Z. Tomczak,** St. Helena—$72,000 for constr. of 12, five-room dwell-

ings, Paso Loma Tract, Napa—by self. 2-7

NAPA CO. — **Younger Construction Co.,** 575 Mission St., San Francisco—$80,000 for constr. of one-story, hvy. wood frame, bin type bldg., in Calistoga—by North Coast Walnut Association, Calistoga. 2-19

ORANGE CO.—**Allison Honer Co.,** Box 84, Santa Ana—$816,318 for constr. of reinf. brick, administration bldg., classroom quadrangle, cafeteria and transformer bldgs. at 17th and Bristol Sts., Santa Ana—by Board of Education, Santa Ana. 2-6

SACRAMENTO CO.—**Continental Construction Co.,** 1402 Front St., Sacramento—$194,222 for constr. of 2-story, reinf. conc. and steel detention home, County Hospital grounds on V St., Sacramento—by County Board of Supervisors, Sacramento. 2-4

SAN BERNARDINO CO.—**Haddock Engineers, Ltd.,** 129 W. 2nd St., Los Angeles —$483,700 for constr. of 3 classroom bldgs., mechanical shop bldg., etc., of steel and wood frame, First & Bigger St., Barstow—by City Union High School District, Barstow. 2-18

SAN DIEGO CO. — **Sinner Bros.,** 4643 Castelar, Ocean Beach, via San Diego—$110,000 for constr. of reinf. conc. mausoleum bldg., 4570 Hilltop Dr., San Diego—by Board of Management, Holy Cross Mausoleum, San Diego. 2-25

SAN FRANCISCO CO.—**Adam Arras & Son,** 116 New Montgomery St., San Francisco—$78,000 to convert govt. surplus prefab. steel bldgs. for classroom use at various city schools, San Francisco—by City and County Department of Public Works, San Francisco. 2-27

SAN FRANCISCO CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$45,000 for alterations to office bldg., 1638 Market St., San Francisco—by Frank Wynkoop, San Francisco. 2-6

SAN FRANCISCO CO.—**Cahill Bros.,** 206 Sansome St., San Francisco—$935,000 for constr. of Class 'A', 13-story, office bldg., E. Beale St., San Francisco—by Pacific Gas & Electric Co., San Francisco. 2-10

SAN FRANCISCO CO.—**Haas & Rothschild,** Merchants Exchange Bldg., San Francisco—$140,000 to remodel 3-story office bldg. at 5700 3rd St., San Francisco—by Alchar California Corp., San Francisco. 2-27

SAN FRANCISCO CO.—**Theo. G. Meyer & Sons,** 200 Quint St., San Francisco—$357,000 for constr. of 42 frame, 2-story dwellings, Rockdale Dr. and Avoca Alley, Dorcas Way, San Francisco—by self. 2-12

SAN FRANCISCO CO. — **Swinerton & Walberg,** 225 Bush St., San Francisco—$80,000 for constr. of one-story, frame church bldg., Judah and 36th Ave., San Francisco—by Eleventh Church of Christ Scientist, San Francisco. 2-11

SAN MATEO CO. — **Moore & Roberts,** 693 Mission St., San Francisco—$300,000 for constr. of one-story, reinf. conc. and marble mausoleum, Holy Cross Cemetery —by Roman Catholic Archbishop, San Francisco. 2-5

SANTA BARBARA CO. — **George B. Thatcher,** 4074 Laurel Canyon Blvd., N. Hollywood—$397,817 for constr. of rigid steel frame elementary school bldg. at Alvin St. School, Santa Maria—by City School District, Santa Maria. 2-21

SANTA CLARA CO.—**Wells P. Goodenough,** 49 Wells Ave., Palo Alto—$47,000 for constr. of one-story, reinf. conc. office bldg. in Palo Alto—by Mutual Building &

Loan Co., Palo Alto. 2-20

SANTA CLARA CO.—**Williams & Burrows,** 10 California Dr., Burlingame—$75,000 for constr. of 2 reinf. conc. research bldgs. and 2 greenhouses, betw. Santa Clara and Los Altos — by Stauffer Chemical Co., San Francisco. 2-27

STANISLAUS CO.—**S. C. Giles,** Elks' Bldg., Stockton—$391,087 for constr. of reinf. conc. high school bldg. at 18th and H Sts., Modesto—by City High School District, Modesto. 2-20

Idaho

ADA CO.—**J. H. Wise & Sons,** Boise—$119,388 for constr. of armory bldg., Julia Davis Park, Boise—by Bureau of Yards & Docks, Washington, D. C. 2-17

Montana

FLATHEAD CO. — **Bramwell Construction Co.,** Kalispell—$50,000 for constr. of one-story, brick, store bldg., Third St., betw. Main and First Ave. W., Kalispell—by Safeway Stores, Kalispell. 2-14

Oregon

MULTNOMAH CO.—**Donald M. Drake Co.,** Lewis Bldg., Portland—$40,000 for constr. of heating plant for hospital at 2266 N.W. Marshall St., Portland—by Board of Management, Good Samaritan Hospital, Portland. 2-7

MULTNOMAH CO.—**A. H. Lake,** 4114 S.E. Franklin St., Portland—$60,000 for constr. of 2-story, 10-unit apartment bldg., 2500 S.E. Couch St., Portland—by Ward Wolf, Portland. 2-18

MULTNOMAH CO. — **Sandberg-Asbahr Co.,** Portland—$77,000 for constr. of apartment bldg. at 2530 N.E. Killingsworth Ave., Portland—by Tech, Inc., Portland. 2-19

Texas

BEXAR CO. — **Colglazier, McKennon & Co.,** Milam Bldg., San Antonio—$42,689 to convert bldg. from Hondo Airfield into gymnasium, San Antonio — by Board of Management, Trinity University, San Antonio. 2-18

BEXAR CO. — **Shaw & Estes,** 1407 S. Akard St., Dallas — $68,072 to convert bldgs. for temporary apartments, Kelly Field, San Antonio—by Corps of Engineers, Galveston. 2-13

CAMERON CO.—**Arthur G. McKee & Co.,** 2300 Chester Ave., Cleveland, Ohio—$20,000,000 for constr. of gasoline and chemical plant in Brownsville—by Carthage Hydrocol Inc., New York, N. Y. 2-4

DALLAS CO. — **Asch-Able Construction Co.,** Construction Bldg., Dallas—$65,774 to constr. 2-story addition betw. Corporation Court Bldg. and City Hall and remodel Corp. Ct. Bldg., Dallas—by City Council, Dallas. 2-13

DALLAS CO.—**Burgher Construction Co.,** 3027 Main St., Dallas—$50,000 for constr. of store bldg., at 1509 Elm St., Dallas—by A. A. Jackson Estate, Dallas. 2-21

DALLAS CO.—**Fincher Construction Co.,** 2523 McKinney, Dallas — $120,150 for constr. of school facilities, Dallas — by Board of Management, Southern Methodist University, Dallas. 2-13

DALLAS CO. — **O'Rourke Construction Co.,** Box 5384, Dallas—$158,000 for constr. of office bldg., at 3209 Manor Way, Dallas—by Industrial Investment Co., Dallas. 2-20

DALLAS CO.—**A. J. Rife Construction Co.,** Box 7096, Dallas—$56,000 for constr. of freight platform addition, Dallas—by Missouri, Kansas & Pacific Railway Co. Dallas. 2-20

DALLAS CO. — **Nathan Wohlfeld,** Box 7084, Dallas—$110,000 for constr. of service bldg. at Plantation Rd. and Wyche Blvd. Dallas—by Hobbs Trailer Equipment Co. Dallas. 2-6

NUECES CO. — **W. R. Reid,** Corpus Christi—$221,000 for constr. of 33 dwellings in Garfield St., Woodlawn Addition Corpus Christi—by self. 2-21

TARRANT CO. — **Andrews & Osborne,** 332 W. 7th St., Fort Worth—$150,000 to remodel basement of 8-story bldg. at Jennings & Lancaster Sts., Fort Worth—by T. & P. Railway Co., Fort Worth. 1-31

TARRANT CO.—**E. S. Hufford,** Bowley Bldg., Fort Worth — $58,900 for school facilities, Arlington—by Board of Management, North Texas Agricultural College, Arlington. 2-13

TOM GREEN CO.—**Evans & Taylor,** 702 Parsons St., San Angelo—$69,900 to remodel and add to junior high school, San Angelo—by City School District, San Angelo. 2-6

Utah

WEBER CO. — **Garland I. Swart,** 2750

Monroe Ave., Ogden—$200,000, cost plus basis, for constr. of approx. 100 bldgs. at Utah State Fair Grounds, Ogden—by State Division of Architecture, Salt Lake City. 2-3

Washington

CLARK CO. — **Beedle Construction Co.,** Vancouver — $52,100 to refinish 4th-floor court room in Vancouver courthouse—by County Commission, Vancouver. 2-18

GRANT CO.—**A. M. Bengel,** Old National Bank Bldg., Spokane—$87,992 for additions and alterations to grade school bldg. in Coulee City—by City Council, Coulee City. 2-11

KING CO. — **Atherton Construction Co.,** Terminal Sales Bldg., Seattle—$100,000 for constr. of one-story, reinf. conc. processing plant, 700-708 5th Ave. S., Seattle — by Yankee-Spredwell Co., Seattle. 2-12

KING CO.—**Paul N. Carlson,** 2756 First Ave., S., Seattle—$120,000 for constr. of 30-bed addition to hospital at 810 Summit Ave., Seattle—by Board of Management, Swedish Hospital, Seattle. 2-13

KING CO.—**Gibbs & Hudson, Inc.,** American Bldg., Seattle—$1,800,000 for constr. of 12-story, 254-unit apartment hotel bldg., 7th and Spring Sts., Seattle—by self. 2-7

KITSAP CO.—**R. B. Ryan,** Port Orchard —$43,193 for constr. of conc. block, municipal bldg., at Prospect and Bay Sts., Port Orchard—by City Council, Port Orchard. 2-12

SPOKANE CO. — **Gus J. Bouten Construction Co.,** N. 216 Division St., Spokane —$950,000 for constr. of 6-story E. wing; conc. foundations to proposed central wing; and alter heating plant at Sacred Heart Hospital, Spokane—by Board of Management, Sacred Heart Hospital, Spokane. 2-21

THURSTON CO.—**Brazier Construction Co.,** 309 Pontius N., Yelm—$137,500 for constr. of 2-story, reinf. conc. creamery bldg. at Yelm—by Enumclaw Cooperative Creamery Co., Yelm. 2-19

Canada

BRITISH COLUMBIA—**Commonwealth Construction Co., Ltd.,** 670 Taylor St., Vancouver—$200,000 to erect office bldg. in 900 block W. Hastings St., Vancouver—by James Richardson & Sons, Vancouver. 2-14

BRITISH COLUMBIA—**Commonwealth Construction Co., Ltd.,** 670 Taylor St., Vancouver—$120,000 for constr. of conc. and steel theater bldg. at 1565 Marine Dr., West Vancouver—by Oden Theatres of Canada, Ltd., Vancouver. 2-1

BRITISH COLUMBIA—**H. Dyer & Son, Ltd.,** 20th and Marine Drive, New Westminster — $52,800 for constr. of primary school in Riverway East, South Burnaby—by City School Board, Burnaby. 2-3

BRITISH COLUMBIA—**Hodgson, King & Marble,** 1401 Main St., Vancouver — $100,000 for constr. of 3-story, reinf. conc. drug bldg. in Vancouver—by Cunningham Drug Stores, Ltd. & Western Wholesale Drug, Ltd., Vancouver. 2-3

BRITISH COLUMBIA — **Marwell Construction Co., Ltd.,** 410 Seymour St., Vancouver—$69,500 for constr. of addition to powerhouse at University, Vancouver—by Board of Management, University of British Columbia, Vancouver. 2-1

BRITISH COLUMBIA — **Ward & Son, Ltd.,** 131 11th Ave., New Westminster—$50,633 for constr. of 6-room addition to Lord Tweedsmuir School, New Westminster — by Board of Management, Lord Tweedsmuir School, New Westminster. 2-14

Miscellaneous . . .

Arizona

MOHAVE CO.—**Monolith Portland Cement Co.,** Los Angeles, Calif.—$345,261 to furn. 120,000 bbls. of cement for structs. at Davis Dam—by Bureau of Reclamation, Boulder City, Nev. 2-6

MOHAVE CO.—**Southwestern Portland Cement Co.,** Los Angeles, Calif.—$115,072 to furn. 40,000 bbls. of cement for structs. at Davis Dam—by Bureau of Reclamation, Boulder City, Nev. 2-6

California

SAN MATEO CO.—**L. C. Smith,** First and Railroad, San Mateo — $275,000 for constr. of streets, curbs and gutters on No. 3 tract, Hillsdale—by David D. Bohannon Organization, San Mateo. 2-4

Oregon

CLATSOP CO.—**Morrison-Knudsen Co., Inc.,** Box 450, Boise, Ida. — $250,000 for constr. of 2 mi. rock fill to replace wood trestle on track along E. Astoria waterfront —by Spokane, Portland & Seattle Railway Co., Portland. 2-13

LANE CO. — **Ramsey Construction Co.,** Corvallis—$122,255 for constr. sts., sidewalks, sewers, water supply lines, etc. at Dorena Dam housing area—by U. S. Engineer Office, Salem. 2-18

Washington

BENTON CO. — **Morrison-Knudsen Co., Inc.**, Box 450, Boise, Ida.—$1,779,258 for general tank constr. at atomic energy plant, Hanford—by General Electric Co., Hanford. 2-12

Foreign

ARABIA—**Bechtel Bros.**, 200 Bush St., San Francisco, Calif., & **H. C. Price Co.**, Bartlesville, Okla.—to constr. approx. 600 mi. main oil pipeline and 4 pump stations at east end of Trans-Arabian pipe line—by Trans-Arabian Pipe Line Co., San Francisco, Calif. 2-27

ARABIA—**Chicago Bridge & Iron Co.**, 400 W. Jackson Blvd., Chicago, Ill.—will erect 14 tanks for Trans-Arabian pipe line—by Trans-Arabian Pipe Line Co., San Francisco, Calif. 2-27

ARABIA—**Consolidated Steel Corp.**, Box 6880, East Los Angeles Branch, Los Angeles, Calif.—to supply 980 miles of pipe for Trans-Arabian pipe line—by Trans-Arabian Pipe Line Co., San Francisco, Calif. 2-27

ARABIA—**Graver Tank & Manufacturing Co.**, East Chicago, Ill.—to erect 22 tanks with total capacity of 5,700,000 bbls., and constr. 2 intermediate pump stations at west end of Trans-Arabian pipe line—by Trans-Arabian Pipe Line Co., San Francisco, Calif. 2-27

ARABIA—**Williams Bros. Corp.**, National Bank of Tulsa Bldg., Tulsa, Okla.—will constr. 450 mi. of main oil line at west end of Trans-Arabian pipe line and build Mediterranean tanker loading terminal — by Trans-Arabian Pipe Line Co., San Francisco, Calif. 2-27

PROPOSED PROJECTS

Power . . .

Arizona

PIMA CO.—Trico Electric Cooperative, Inc., Marana, has been granted a loan of $600,000 for constr. of 185 mi. of line to serve 572 rural consumers, constr. 115 mi. of line to serve 77 consumers and purchase 70 mi. of line from Elroy Light & Power Co. Rural Electrification Administration, Washington, D. C. 2-21

California

MODOC CO.—Surprise Valley Electric Corp., Alturas, received a $465,000 loan from the Rural Electrification Administration, Washington, D. C., for construction of 230 mi. of line to serve 362 rural consumers.

VARIOUS COS.—Surprise Valley Electric Corp., Alturas, Calif., received $465,000 for the constr. of 230 mi. of transmission line in Modoc and Lassen Cos., Calif., and Lake Co., Ore. Loan was granted by the Rural Electrification Administration, Washington, D. C. 2-25

Texas

BANDERA CO.—Bandera Electric Cooperative, Inc., Bandera, received $425,000 for constr. of 320 mi. of rural electric lines from the Rural Electrification Administration, Washington, D. C. 2-6

TRADE WINDS

News of Men Who Sell to the Construction West

INTERNATIONAL HARVESTER

INTERNATIONAL HARVESTER CO., Motor Truck Division, celebrated 40 years of successful and constantly expanding production by an impressive ceremony at its Fort Wayne, Indiana, truck plant late in January. Before an audience of civic officials, company officers and the editors of trade and technical papers and magazines from all over the United States, the full line of 1947 trucks for all purposes was introduced by **W. K. Perkins,** manager of sales for the motor truck division.

The "truck show" started with the introduction of one of the original 1907 models, a high-wheeled, solid-tired vehicle powered by a 2-cylinder, horizontal opposed, hand-cranked engine with power transmission by chains to the rear wheels. This old model entered the display arena with bulb-horn blowing, traveling proudly under its own power.

Next came 1917, 1927, and 1937 models, demonstrating the continual improvement International has made to its truck line. Following them, the display showed the entire "KB" line of 15 basic models, all manufactured at Fort Wayne, and one of the six models in the very heavy duty "W" or "Western" line, manufactured at Emeryville, Calif.

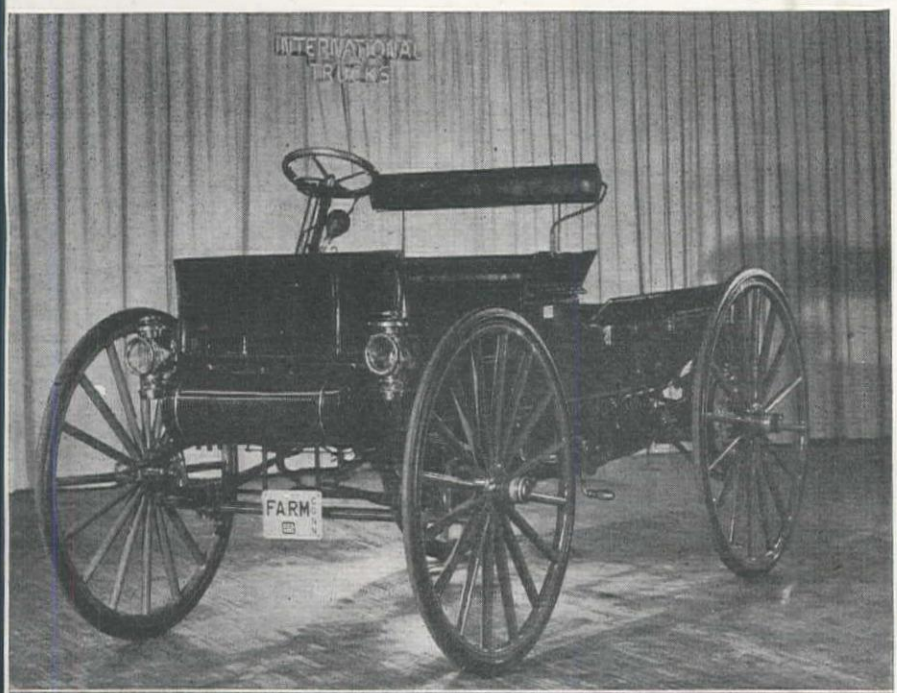
With the great variety of body models available for specific uses, these 21 basic models of International trucks may be converted into over 1,000 different styles of trucks. Specifications for the trucks vary from those of the KB-1, which has a gross vehicle weight rating of 4,400 lb., and wheelbase of 113 in., to the KB-11F which has a weight rating of 48,100 lb., and a wheelbase of 215 in. The "W" models include two 6-wheel highway types with gross vehicle weight ratings of 30,000 and 40,000 lb., and four off-highway types with weight ratings of 40,000, 45,000, 65,000 and 90,000 lb. Either diesel or gasoline or butane fuel burning engines may be used in these six "W" models.

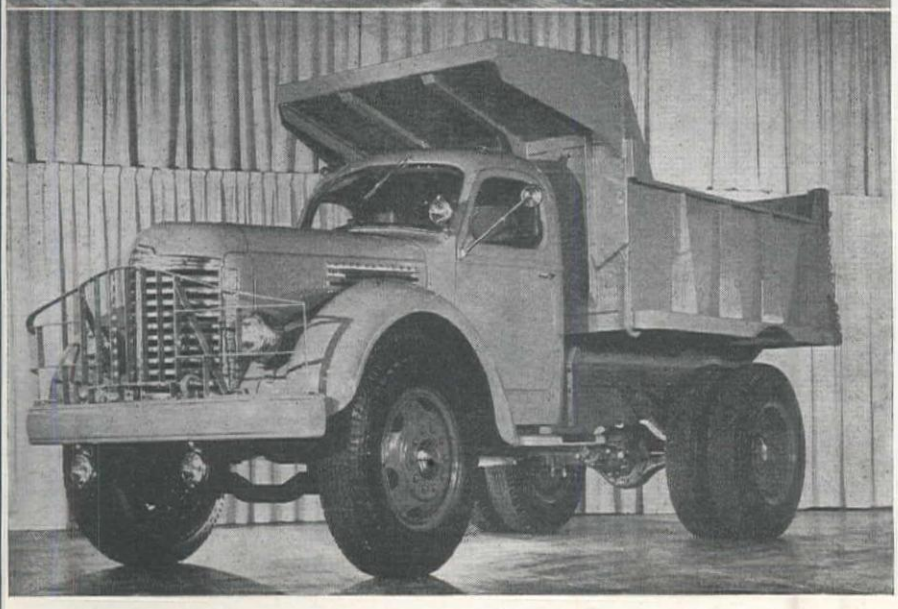
After the presentation of the trucks, the guests were treated to an inspection visit through the Fort Wayne assembly plant and over the truck proving ground. Service training programs for dealer and fleet mechanics were explained, as was the special service International offers in fitting a truck specifically to the job for which it is intended. The parts program, pricing policy, and service station arrangement were all discussed by the people in charge of the work.

Luncheon was served to the guests in the plant cafeteria, and an excellent cocktail party, dinner and program in the evening climaxed the day's activities. The dinner featured a brief but impressive address by **J. L. McCaffrey,** president of International, outlining a common-source approach to the industrial relations problems.

The truck show and 40th Anniversary party was attended by 94 editors or editorial representatives, including the editor of Western Construction News, and seven others from the Pacific Coast. About 120 International officials were at the session, headed by McCaffrey, and including **P. V. Moulder,** executive vice-president, **W. C. Schumacher,** general manager of the motor truck division, who was responsible for the whole presentation show, and **W. K. Perkins,** manager of truck sales. Others who participated in the program were **D. B. Erminger,** service section supervisor; **S. Colacuori,** supervisor of sales engineering; **J. W. Simpson,** manager of sales operations research; **M. D. Dean,** parts sales supervisor; **W. D. Reese,** manager of engineering; **V. A. Guebard,** manager of manufacturing; **G. D. Wade,** comptroller; **D. A. Conroy,** manager of supply and inventory; **Hugo Weissbrodt,** works manager at Fort Wayne; **Sam Houston,** public relations manager and **E. B. Waltzek, Jr.,** manager of industrial relations.

SHARPLY CONTRASTING are the first model "power wagon," manufactured by International Harvester in 1907 (top) and the heavy duty models being distributed today, typically illustrated by construction and mining dump truck shown, (bottom).





☆ ☆ ☆

CALIFORNIA

Thomas L. Garland, who has been a special representative on the West Coast for some months past for the BLACKMER PUMP CO., Grand Rapids, Mich., has been placed in charge of the California territory. He will have charge of sales of the entire line of power and hand-operated rotary pumps and strainers, and will maintain offices at 98 Folsom St., in San Francisco. **L. L. "Dusty" Rhoades,** former personnel director of Blackmer, has been named representative in charge of the Los Angeles office located at 415 S. Central Ave.

☆ ☆ ☆

At an annual election meeting of the Propeller Club, Port of San Francisco, recently, **W. M. Laughton,** district general manager of BETHLEHEM STEEL CO.'s west coast yards, was elected for a one-year term as president. Laughton succeeds **Joseph J. Geary,** San Francisco admiralty attorney. **L. A. Lapham,** assistant to the president of the American Hawaiian Steamship Co., was elected first vice-presi-

dent, and **Eugene Hoffman,** public relations director of the American President lines, was re-elected as secretary-treasurer.

☆ ☆ ☆

Fred Connors, operator of the WESTERN SERVICE & EQUIPMENT CO., has expanded from a small shop on 6th Avenue to a larger office at 3641 Rosecrans Ave., San Diego. He will continue to handle service station equipment. Sharing the space with him is **Vic Bailey,** who will take care of the new branch of the Industrial Equipment Co., handling heavy construction equipment.

☆ ☆ ☆

C. H. Hoefer, formerly with the Northern Commercial Company, Seattle, is now associated with the PETERSON TRACTOR & EQUIPMENT CO., San Francisco, dealers in Caterpillar and John Deere tractors.

☆ ☆ ☆

After thirteen years with the General Electric Co. and ten years with Victor Equipment Co., six as manager in the San Diego area, **H. E. Bailey** has gone in business for himself. The name of the new company is BAILEY EQUIPMENT CO., located at 148 West E St., San Diego.

☆ ☆ ☆

Equipped with a $100,000 inventory of parts for all makes of trucks, MOTOR TRUCK SALES & SERVICE, a super-deluxe truck service station, recently opened for business. Operated by **Walter C. Jaynes** and **Dick Strickland,** the station is located in Bakersfield, on U. S. Highway 99, the most heavily-traveled truck highway in the United States, and uses Tide Water Associated products exclusively. Its layout covers 300,000 sq. ft., with every operation designed to accommodate 70-ft. length truck and trailers. Dormitories are also provided for truckmen.

☆ ☆ ☆

JOSEPH T. RYERSON & SON, INC., Chicago, steel distributors, recently announced the appointment of **Freeman X. Kinzie** as West Coast representative of the Bearings and Babbitt Division. He will specialize in the sale of Ryertex non-metallic bearings and Glyco babbitt metals, making his headquarters at the company's Los Angeles plant located in the Central Manufacturing District. Kinzie succeeds **O. K. Graef** who resigned last year.

☆ ☆ ☆

The FRUEHAUF TRAILER CO. recently entertained Western press representatives at the Jonathan Club in Los Angeles. Guests also included **E. Raymond Cato,** Chief, California Highway Patrol, **C. E. Ellis,** president of the Los Angeles Automotive Council, and **Sam Simpson,** president of Transport Insurance Exchange. **W. J. Pickhardt,** vice-president and general manager of Fruehauf introduced the speakers.

☆ ☆ ☆

AMERICAN SAW MILL MACHINERY CO. of Hackettstown, N. J., opened a branch office in San Francisco Feb. 1. This new office will carry a stock of saw mill and woodworking machinery together with parts, and will be in a better position to service customers and dealers in the West Coast area. **William L. Fibben** has been named district manager, and will make his headquarters at the new office located at 7 Front St.

☆ ☆ ☆

The WESTINGHOUSE ELECTRIC CORP. has acquired a long term lease on a 3-story building at 410 Bush St. in San Francisco. **Chas. A. Dostal,** vice-president in charge of the Pacific Coast district, recently announced. Alterations are now under way, and when completed about July 1 the building will provide 40,000 sq. ft. of space, filling a long need for consolidation, in one location, of the personnel of many departments now housed in scattered downtown buildings.

☆ ☆ ☆

With the object of better service to its customers, JOHN W. STANG CORPORATION has moved its West Coast headquarters from San Diego to a new plant at Bell in Los Angeles County. The new headquarters consists of a large structural steel building completely equipped for the manufacture and reconditioning of Wellpoint equipment. It is located at 8221 Atlantic Ave., and covers approximately one acre of ground in the heart of the industrial district.

☆ ☆ ☆

RHEEM MANUFACTURING CO. has acquired the nationally known line of Fraser gas furnaces and winter air conditioners, it was announced recently by **R. S. Rheem,** president. The company will manufacture the Fraser line at the Fraser furnace plant at Stockton, under a lease arrangement. The line will also be made at the Rheem heating equipment plant at Chicago.

Byron W. Butler was recently appointed manager of the Seattle branch of W. P. FULLER & CO., San Francisco, to succeed **George W. Feldmann,** who retired at his own request in January. Butler has been with the company since 1916, and has been manager of the Salt Lake City branch for the past 16 years. Feldmann had completed 40 years' service with the firm at the time of his retirement.

☆ ☆ ☆

J. T. JENKINS CO., distributors of KENWORTH trucks and buses in California, Arizona, Nevada, and New Mexico, recently opened new headquarters in northern California. Located at 1140 Folsom St., San Francisco, the new $275,000 building provides a spacious repair shop with the most modern equipment available for the diversified activities of the firm. Occupying more than 9,200 sq. ft., the shop is equipped to handle every type of job from brake relining to the complete rebuilding of a wrecked truck. Typical of the modern equipment are the special drills, pneumatic-type electric presses, and air hammer riveters available for rebuilding frames. A well-stocked parts department is another division of the new shop. The stock includes Kenworth and other heavy duty truck parts such as Cummins, Spicer, Brown-Lipe, Timken, Ross, Gemmer, Westinghouse, and Timken bearings. **J. T. (Tom) Jenkins** is president of the company, and **L. M. (Les) Jenkins** is vice-president and manager of the San Francisco branch. **A. E. MacCready** is parts manager, and **Carl Hammill** is shop superintendent in the San Francisco branch.

☆ ☆ ☆

Further expansion of GOODYEAR TIRE & RUBBER CO.'s manufacturing facilities for mechanical and molded goods products was announced recently by **Dent W. Sanford,** vice-president of the Los Angeles factory. Equipment is to be installed for production of automobile floor mats, and several small-type tires for toys, lawnmowers and industrial vehicles will be produced daily. At the same time, the appointment of **Ben Lee Mattingly** in the newly created post of manager of molded goods sales, Los Angeles, was announced by **W. C. Winings,** manager of the company's Mechanical Goods Division in Akron. Mattingly has been with the company since 1934.

☆ ☆ ☆

E. L. King, Western district manager for FULLER MANUFACTURING CO., Kalamazoo, Mich., and its subsidiary, Unit Drop Forge of Milwaukee, Wis., is in charge of their temporary Western district headquarters at 308 Thayer Building, 577 West 14th St., Oakland, Calif. The company builds heavy duty transmissions.

☆ ☆ ☆

Headquarters of the HERCULES POWDER CO. in Los Angeles is now located in the Chamber of Commerce Bldg., at 1151 South Broadway.

☆ ☆ ☆

GOLDEN STATE EQUIPMENT CO., 4770 Valley Blvd., Los Angeles, has been appointed distributor for Gradall, a unique new earth moving machine being manufactured by THE WARNER & SWASEY CO., Cleveland, Ohio. Golden State Equipment Co. will handle dealer sales of Gradall for the southern section of the state, including San Luis Obispo, Kern, San Bernardino, Mono and Inyo counties, as well as Nye, Lincoln, Clark and Esmeralda counties in Nevada.

The plant and other assets of the COOPER SCREW MANUFACTURING CO. of Los Angeles was recently acquired by RUSSELL, BURDSALL & WARD BOLT & NUT CO. of Port Chester, N. Y. **Charles D. Brenner,** formerly in charge of the Los Angeles office of RB&W, becomes manager of sales for the new plant, with **R. A. MacDonald** from the RB&W Port Chester plant serving as plant manager at Los Angeles.

☆ ☆ ☆

J. P. Roberts has been named district manager of the FORD MOTOR CO. in Long Beach, with headquarters at 700 Henry Ford Ave. He replaces **N. F. Bowe** who has been transferred to Edgewater, N. J., as district manager there.

INDUSTRIAL EQUIPMENT CO. of San Francisco has opened a branch office at 3617 Rosecrans St. in San Diego, under the management of **V. V. Bailey.** Bailey comes from the Los Angeles office and was recently released from the Army service where he was a lieutenant in the air corps.

☆ ☆ ☆

Fred S. Carpenter, longtime resident of Los Angeles, has been appointed director of manufacturing for the UNITED STATES RUBBER EXPORT CO., LTD., Los Angeles, according to **L. C. Boos,** president of the company. Carpenter's new position places him in charge of all foreign factory operations, including plants in South America, Mexico, Cuba,

South Africa, and elsewhere. Just recently he returned from Sumatra and Malaya, where he had been a member of a survey party to inspect the company's plantations.

☆ ☆ ☆

CAPITOL TRACTOR & EQUIPMENT CO., Sacramento, has recently been appointed distributor for MIXERMOBILE MANUFACTURING CO., of Portland, Ore., covering the San Joaquin and Sacramento valley territory from Fresno to Redding. Products handled by this distributor are the Scoopmobile, Mixermobile, Towermobile and Buggymobile. Capitol Tractor & Equipment Co. is owned and managed by **Carl E. Danielson.**

☆ ☆ ☆

Henry B. King of the Sales Division, W. P. FULLER & CO., San Francisco, has been elected president of the San Francisco Junior Chamber of Commerce for 1947. King succeeds Matthew C. Carberry, who recently was elected to the San Francisco Chamber of Commerce board of directors.

☆ ☆ ☆

COLUMBIA STEEL CO., Pacific Coast subsidiary of United States Steel Corporation, recently concluded arrangements for the purchase of CONSOLIDATED STEEL CORPORATION, subject to approval of the stockholders of Consolidated Steel. At present the U. S. Steel Corporation has no steel fabricating operations on the Pacific Coast, other than the drum and container plants of U. S. Steel Products Co. at Los Angeles and in Alameda. The fabricating operations of Consolidated's major plants in the San Francisco and Los Angeles areas should provide a market for considerable tonnage of plates, sheets and structural steel to be produced at the Geneva, Utah, plant recently purchased from the Government by U. S. Steel.

☆ ☆ ☆

Construction of the new quarter of a million dollar steel supply and servicing facilities of the CAINE STEEL CO. of California at 65th & Hollis St., in Emeryville will be completed in March, according to **Marshall Wais,** general manager of Caine Steel. **Max Rudorfer,** Northern California manager, with offices in Emeryville, is in charge of the activity.

☆ ☆ ☆

THE LINCOLN ELECTRIC CO., Cleveland, Ohio, world's largest manufacturer of electric arc welding equipment, announces the new locations of its branch offices in San Francisco and Los Angeles.

The new location of the San Francisco office and warehouse is at 1302 Stanford Ave., in Emeryville, Calif., headed by **L. P. Henderson.** The Los Angeles office and warehouse, under the direction of **J. B. McCormick,** is at 1500 Calzona St.

☆ ☆ ☆

INTERMOUNTAIN

UNIVERSAL SAFETY APPLIANCES CO. of Salt Lake City opened a branch office in Boise, Idaho, late in January. The new office is under the direction of **D. D. (Jack) Peters,** and carries a full line of safety equipment including flameproofing material, first aid equipment, rescue apparatus, fire hose, safety clothing, and respirators. The office is located at 317 North Tenth St., in Boise.

J. I. Chitwood, assistant manager of the Denver branch, has been transferred to Great Falls, Mont., where he is manager of the INTERNATIONAL HARVESTER CO. branch. He succeeds **P. H. Cushman,** who was transferred to Salt Lake City as manager of the farm equipment division there.

☆ ☆ ☆

The seventh in a chain of plywood distributing warehouses will be opened shortly in Dallas, Tex., by U. S.-MENGEL PLYWOODS, INC., a company jointly owned by the Mengel Company and United States Plywood Corporation, it was announced recently by **L. B. Olmsted,** vice-president and general manager. **R. E. McKee,** who has represented the United States Plywood Corporation in the Dallas area for several years, will become U. S.-Mengel Plywoods, Inc. branch manager.

☆ ☆ ☆

THE JOSLYN COMPANIES, distributors of Pole Line Equipment, have been appointed distributors of the Hole Digger on a nation-wide basis, the Hugh B. Williams Manufacturing Company of Dallas, Tex., announced recently. The Digger, a heavy duty machine, is manufactured in three sizes. It will dig inclined or vertical holes up to 20 feet deep and from eight to thirty-six inches in diameter.

☆ ☆ ☆

Directors of the GOODYEAR TIRE & RUBBER CO., meeting in Litchfield Park, Ariz., recently declared regular quarterly dividends of $1 per share on common stock and $1.25 per share on preferred stock. The directors were there on an in-

spection tour of Goodyear's western plants, following which they proceeded to Los Angeles to inspect the west coast tire factory and the Goodyear-operated government synthetic rubber plant. During the meeting, **Thomas E. Wilson** of Chicago, and **B. A. Polsky** of Akron, Ohio, were elected to the board of directors. They filled vacancies caused by the recent deaths of **George A. Martin** of Cleveland, and **Robert C. Schaffner** of Chicago. Wilson is chairman of the board and chief executive officer of the meat packing firm of Wilson & Company. Polsky is president of the A. Polsky Co., Akron department store.

☆ ☆ ☆

Albert J. Bauer was recently appointed sales representative in the Rocky Mountain states for JOSEPH T. RYERSON & SON, INC., Chicago warehouse steel distributors. District sales office headquarters of the company are maintained in the Denver National Building, Denver, Colo. **E. F. Wood,** formerly in charge of the Denver office, has been assigned to a new post as manager of the work order department at the Ryerson Los Angeles steel-service plant which opened in October. Bauer became associated with Ryerson in 1940. During the war he served as a bomber pilot with the Army Air Forces.

☆ ☆ ☆

The purchase of the BANKS MORELAND COMPANY, Houston, Tex., was announced recently by the GRAVER TANK & MFG. CO., INC., of East Chicago, Ind. The new division will be under the management of **Banks Moreland,** who has been made a vice-president of Graver Tank & Manufacturing Company. It will continue to operate in the Southwest as Banks Moreland Company, a division of Graver Tank and Manufacturing Company, Inc.

☆ ☆ ☆

Acquisition of a tract of 1920 acres of land near Phoenix, Ariz., as a site for experimental testing, was announced recently by the INTERNATIONAL HARVESTER CO., Chicago, Ill. The land, formerly used by General Motors as a tank testing site during the war, is located about 23 mi. from Phoenix and has been leased for a period of five years from the Arizona State Land Department.

☆ ☆ ☆

PACIFIC NORTHWEST

Charles E. Devlin, formerly publicity director for the DOUGLAS FIR PLYWOOD ASSOCIATION, has been appointed as managing director of the association, succeeding **W. E. Difford,** who resigned about seven months ago. **Harrison Clark,** acting manager since Difford's resignation, will continue as assistant manager. **Winston H. McCallum,** assistant publicity director since 1941, succeeds Devlin as director. Announcement of the promotions was made last month by **E. W. Daniels,** Hoquiam, Wash., chairman of the industry management committee and president of the Harbor Plywood Corp. Headquarters for the Douglas Fir Plywood Association are in Tacoma, Wash.

☆ ☆ ☆

MILL-LOG EQUIPMENT CO., a recently organized firm under the direction

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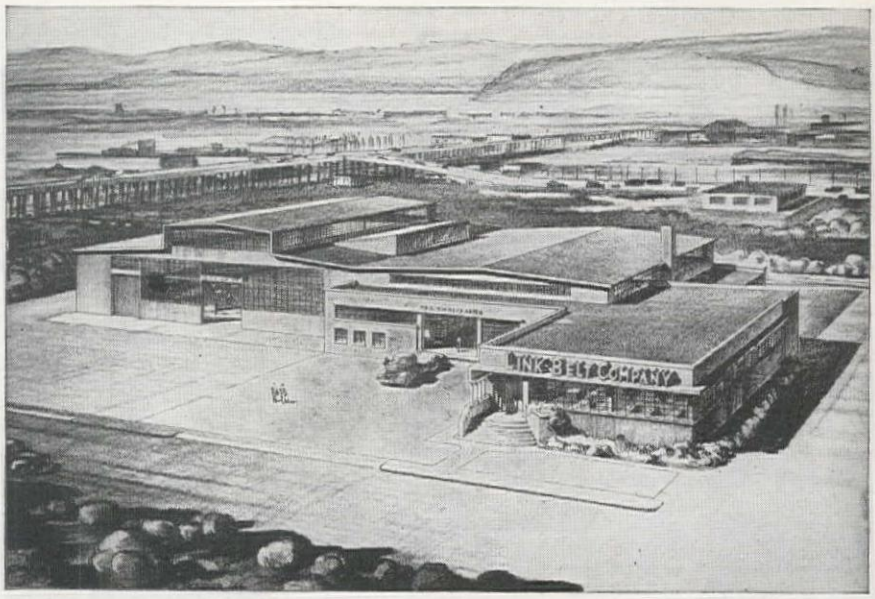

NEW PLANT of the Link-Belt Company Pacific Division at Seattle. It was built to better serve the industries of the Great Northwest, either direct or through the company's factory branch stores at Spokane, Wash. and Portland, Ore. FRED A. KOEPH, district manager, and HARVEY V. EASTLING, manager of engineering sales, with headquarters at the new plant, direct activities in the Northwest.

of **E. W. Rose,** owner and manager, has been appointed representative for the TWIN DISC CLUTCH CO. in the Eugene, Ore., area. Mill-Log has just completed the construction of a new plant at 1355 Railroad Blvd. in Eugene, where it is prepared to service, overhaul, and replace parts of Twin Disc torque converters, hydraulic couplings, and marine reverse and reduction gears.

☆ ☆ ☆

Jack Ryan, salesman for the NORTHWEST PORTLAND CEMENT CO. of Seattle, has been promoted to the position of general sales manager for the company.

☆ ☆ ☆

DULIEN STEEL PRODUCTS, INC., moved into its new Seattle headquarters on East Marginal Way the first of March. The new office and warehouse building is of wood and stucco exterior with interior features including fluorescent lighting, asphalt tile floors, and a plant-wide intercommunication system. In addition to yard facilities the plant will have docking facilities and spur track connection with four railroad lines. The salvage and liquidating firm is headed by **Louis Dulien** as president, with **Ann Dulien** as secretary, **H. B. Keisler,** general manager; **G. E. Rosenwald,** assistant manager and assistant secretary.

☆ ☆ ☆

PACIFIC COAST CEMENT CO. has taken over the operation of its Seattle plant following expiration of a fifteen-year lease to Superior Portland Cement, Inc., on Dec. 31, last year. Pacific Coast Cement Co. is manufacturing Diamond Cement for the trade in the Pacific Northwest and in Alaska from raw materials shipped from Dall Island, Alaska.

☆ ☆ ☆

Carl H. Erlandson, retail sales manager for the Seattle branch of the INTERNATIONAL HARVESTER CO., has been promoted to the position of assistant branch manager. Erlandson served in the Portland branch before coming to Seattle 4 years ago. **Thomas S. McHugh,** zone manager, has been promoted to retail sales manager succeeding Erlandson.

George Porter, secretary of the Seattle Construction Council, resigned several months ago to accept a position with the SEATTLE BRASS CO. Prior to joining the Construction Council he had been associated with the SEATTLE STEEL CO.

☆ ☆ ☆

C. F. Brunson, for the past three years representative of the ADHESIVES PRODUCTS CO. at Eugene, Ore., has been promoted to assistant sales manager of the organization and transferred to the company's main office in Seattle, where he will serve under **W. F. Shelley,** sales manager.

☆ ☆ ☆

BOWERS MACHINE SHOP, 416 John St., Seattle, representative for the TWIN DISC CLUTCH CO. in the Seattle area, has recently moved into larger quarters and improved its services to Twin Disc users including overhaul, parts replacement, and testing service. **Charles Bowers** is owner and manager of the shop.

☆ ☆ ☆

Dugald McKinnon has been appointed Portland district manager for the tire division of U. S. RUBBER CO. McKinnon has been with the company in various positions on the Pacific Coast for the past 15 years, most recently having been in charge of commercial tire sales in the Portland district. He succeeds the late **William J. Sundstrom.**

☆ ☆ ☆

Carl C. Mueller, formerly purchasing agent for A. M. CASTLE & CO., steel distributors, has been elected a vice-president of the firm and appointed manager of the Seattle branch of the Castle organization. He succeeds **John B. Robbins,** who has been placed in charge of the Kansas City branch.

☆ ☆ ☆

HEWITT RUBBER DIVISION of Hewitt-Robins, Inc., Buffalo, N. Y., has announced the appointment of the Hawaiian Equipment Company, Ltd., Honolulu, as its distributor of the complete Hewitt line of industrial hose and belting throughout the Hawaiian Islands. The new company is

directed by **W. P. Sheehan,** vice-president and general manager. The company specializes in mechanical products and heavy-duty field and construction equipment.

☆ ☆ ☆

PULLMAN TRACTOR & IMPLEMENT CO., Pullman, Wash., opened its new $200,000 home recently. **Gordon Klemgard** and **E. N. Klemgard** are partners in the firm.

☆ ☆ ☆

Gordon Murray has returned to the staff of the TRUSCON STEEL CO., at Seattle, succeeding **Guy Taylor,** who has moved to Portland and entered engineering practice there.

☆ ☆ ☆

AMONG THE MANUFACTURERS

Lloyd E. Tracy has been elected vice-president of the OIL WELL SUPPLY CO., U. S. STEEL subsidiary. Tracy retains the position of general manager of sales. He came to Oil Well Supply early in 1935 from National Tube Co., another U. S. Steel subsidiary. He was appointed general manager of sales for Oilwell in 1943, and is now advanced to the position of vice-president and manager of sales.

☆ ☆ ☆

DROTT MFG. CORP. has completely new, modern office and manufacturing buildings at 4344 North Green Bay Ave., Milwaukee, Wis. An unusual, but yet natural method of landscaping of frontal property was employed. Instead of hauling in dirt to raise the ground to desired height, refuse from suburban towns was used. In short, this company constructed a sanitary fill in its front yard with its own bullcalm shovel. Officers with headquarters at the new site are: **E. A. Drott,** president; **F. Frantz,** vice-president; **Ed Drott, Jr.,** treasurer and chief engineer; **John Drott,** secretary and sales manager.

☆ ☆ ☆

New sales promotion manager for PIONEER ENGINEERING WORKS, INC., Minneapolis, Minn., is **W. A. Rundquist,** who will have charge of advertising, sales promotion, and sales training. The company manufactures heavy equipment for the quarry, gravel, mining and paving industries. During the war, Rundquist served with the Corps of Engineers as Post Engineer, later was assigned to the Office, Chief of Engineers as Administrative Officer, Critical Components Section.

☆ ☆ ☆

The Shovel and Crane Division of LIMA LOCOMOTIVE WORKS, INC., Lima, Ohio, has recently announced several new appointments. **J. W. Artz,** who has been associated with the Lima company since 1928 in the capacity of Parts Sales and Service Manager, has been named Director of Parts Sales and Service. **Howard W. Read,** formerly Assistant Parts Sales and Service Manager, has been appointed Parts Sales Manager, with **William D. Lutes** as Assistant Parts Sales Manager. **T. A. Griffin,** formerly Service Engineer, has been named Service Manager of the Shovel and Crane Division.

☆ ☆ ☆

Appointment of **Austin K. Thomas** as sales manager of the Construction Machinery Division of the CHAIN BELT COMPANY, Milwaukee, Wis., was recently announced. Thomas has been associated with the construction machinery industry for over 20 years, and was eastern district manager of Chain Belt before his recent promotion.

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LE ROI COMPANY, Milwaukee, Wisc., manufacturers of internal combustion engines, portable compressors, engine-generator sets and specialized mowing equipment, announces the purchase of the Cleveland Rock Drill Company of Cleveland, Ohio. Cleveland rock drills and associated air tools have been manufactured since 1906 and have long been recognized as leaders in their fields. **Russ Morgan,** formerly secretary and sales manager of the Cleveland Rock Drill Company, who joined Le Roi over a year ago, will head the expanded facilities. **John M. Dolan,** vice-president in charge of sales, will head the integration of sales activities of all Le Roi products from the company headquarters at Milwaukee.

☆ ☆ ☆

Election of **C. E. Frudden,** of the Tractor Division, ALLIS-CHALMERS MFG. CO., Milwaukee, Wisc., as the 1947 president of the Society of Automotive Engineers was announced at the business session of the SAE 1947 annual meeting recently. President-elect Frudden succeeds

L. Ray Buckendale, of Timken-Detroit Axle Co., Detroit, who served for 1946. Frudden remains a consulting engineer for the Tractor Division of ALLIS-CHALMERS, with whom he has been associated for a number of years.

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Charles S. Hegel was appointed manager of the Stainless Steel Division while **John W. Queen** became manager of the Alloy Steel Division of JOSEPH T. RYERSON & SON, INC., steel distributors, it was announced recently by **Everett D. Graff,** president. Executive headquarters are maintained in Chicago. **G. Van Dyke,** former head of the Ryerson Special Steels Divi-

HEGEL

QUEEN

sion, retired in December after 30 years service with the firm. Hegel joined the company in 1928, and was in charge of the Special Steels Department of the Chicago plant prior to his promotion. Queen became a member of the Ryerson sales staff in 1933, and has been active in metallurgical circles in the East.

☆ ☆ ☆

A. C. Fetzer, vice-president, was elected recently to the Board of Directors of MACK MANUFACTURING CORPORATION, New York City. Fetzer, who was acting general sales manager, was at the same time appointed general sales manager. **Leonard E. Matzner** was appointed advertising manager. Since his return from active duty in the Pacific war theater he has been acting as assistant advertising manager.

☆ ☆ ☆

The appointment of **Frank M. Clark** and **D. E. Craig** to new positions in the GENERAL ELECTRIC COMPANY was announced recently. Clark, insulation expert at the Pittsfield Works of the General Electric Company's Apparatus Department and Assistant Engineer of the Works Laboratory there, has been named Technical Consultant on Insulation of the entire Apparatus Department by **E. E. Johnson,** manager of Engineering of that department. Clark has been engaged in insulation research and development work since he joined the company in 1923.

Craig has been appointed Manager of Sales of General Electric's Unit Substation Section, Unit Equipment Division. He has been with the company since 1936, working first on Test, later in the Distribution Systems Division, and then in the Contractor Section.

☆ ☆ ☆

George P. Hough has been appointed executive administrator of the A. O. SMITH CORPORATION's Chicago District, succeeding **Don T. Allen** who resigned recently. Hough, a graduate of the law school of the University of Minnesota in 1920, has been with the company since 1939. He has been assistant administrator in direct charge of several sales activities since 1944.

Francis J. Kennerley, treasurer of the HERCULES POWDER CO., Wilmington, Del., since March, 1943, was recently elected to the board of directors. He has been employed by the company since 1913, when he began as auditor and accountant. His election to the board fills a vacancy caused by the recent retirement of **Luke H. Sperry.**

☆ ☆ ☆

C. F. Goodrich, chief engineer, AMERICAN BRIDGE CO., has retired after 40 years of service with this U. S. STEEL subsidiary. Goodrich was in charge of the designing and engineering for American Bridge in the building of the San Francisco-Oakland Bay Bridge. He began work with the company in 1906 as a draftsman at the Trenton, N. J., plant and has held various other positions in the company's engineering department prior to his appointment as chief engineer in 1935. He is a member of the American Society of Civil Engineers and was a national director from 1943 to 1945; a member of the American Society for Testing Materials, American Institute of Steel Construction, Pittsburgh Chamber of Commerce, American Welding Society and Dartmouth Society of Engineers.

☆ ☆ ☆

Robert H. Bishop, director of sales, and **Conda P. Boggs,** director of manufacturing, were elected vice-presidents of SYLVANIA ELECTRIC PRODUCTS, INC., at a New York meeting recently, it was announced by **Don G. Mitchell,** president. Bishop joined the company as a member of its New England Sales Force in 1936. After subsequent promotions, he was appointed director of sales for the entire company last April. Boggs joined Sylvania Electric in 1932 and was appointed director of manufacturing in 1942.

☆ ☆ ☆

J. F. Lincoln, president of the LINCOLN ELECTRIC COMPANY, announced recently the selection of **W. R. Persons** as sales manager of the company. Persons, a graduate of the Case Institute of Technology in 1932, reports to **C. M. Taylor,** newly advanced to executive vice-president.

☆ ☆ ☆

W. W. Paape, district representative in the Chicago territory for the EUCLID ROAD MACHINERY CO., Cleveland, O., was recently promoted to the position of domestic sales manager. He will assume his new duties on Mar. 28. Paape has been active in the construction industry for over twenty years. Prior to his association with Euclid he served as representative for Caterpillar Tractor Co., La Plant Choate Mfg. Co., and as sales manager of Syracuse Supply Co.

☆ ☆ ☆

The BROWN INSTRUMENT CO., Philadelphia, Pa., recently added 38 new sales and service engineers to 23 of its branches throughout the country and Canada. All 38 have just completed an intensive course in industrial instrumentation at the Brown Instrument School. The course comprised specialized instruction in addition to the technical education which each engineer had had previously. Men appointed to western areas are: **W. E. Dixon,**

sales, and **W. S. Blackman,** service, Los Angeles; **P. S. Williams,** sales, and **O. G. Janacek,** service, Portland, Ore.; **J. R. Culver,** sales, San Francisco.

☆ ☆ ☆

The appointment of **John C. Campbell** as manager of industrial engine sales and **James W. Brown** as advertising manager was announced recently by **V. C. Genn,** general sales manager for the DETROIT DIESEL ENGINE DIVISION of General Motors. Campbell joined Detroit Diesel in 1942, prior to which time he had been associated with the Frigidaire Division of General Motors and the Wright Austin Company. Brown, who now takes over as advertising manager, has been directly connected with advertising and publication work since 1927, and for the past year has held the position of product news manager for Detroit Diesel.

☆ ☆ ☆

E. H. Jeffords, recent director of RAYBESTOS - MANHATTAN, INC., and general manager of General Asbestos & Rubber Division, North Charleston, S. C., died December 12 at his home in Charleston, at the age of 71. Jeffords had been associated with the company since November, 1917. He was succeeded by **A. F. Heinsohn** as general manager.

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Appointment of **Francis J. Wakem** as vice-president of JOHNS-MANVILLE SALES CORP. was announced recently by **R. W. Lea,** president of Johns-Manville. Wakem will also continue as merchandise manager of the Industrial Products Division. He is a member of the firm's Quarter Century Club.

The UNION WIRE ROPE CORPORATION, Kansas City, Mo., announces the expansion of their technical staff, with **Walter Voightlander** named Technical Director and **Charles M. Zerr** appointed Chief Engineer. Voightlander has been actively engaged in technical and research work in the wire rope industry

VOIGHTLANDER

ZERR

for 43 years. He has been chief engineer of Union Wire Rope since 1927. Zerr for the past 12 years has been assistant to Voightlander.

Other advancements in the enlargement of Union Wire Rope's technical service include **Raymond O. Kasten** as Assistant Technical Director, **Robert C. Downey,** Research Chemical Engineer, **Omer Brenton,** Assistant Metallurgist and **Dwain L. Bedford,** metallurgist in charge of the chemical, physical and metallurgical functions of the laboratory.

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Charles G. Andrew, operating and engineering executive of the AIR REDUCTION COMPANY, INC., New York City, was chosen as president of the Compressed Gas Manufacturers' Association at that group's annual meeting held recently in New York. Other officers elected at that time were: **L. W. Hench** of the American Oxygen Service Co., first vice-president; **Edmund Rowland** of Henry Bower Chemical Mfg. Co., second vice-president; and **F. R. Featherston,** secretary-treasurer.

☆ ☆ ☆

John E. Garlent, executive vice-president of MOTOR WHEEL CORPORATION, Lansing, Mich., since 1940, has been elected president of the corporation by the board of directors. Garlent succeeds **Harry F. Harper,** president and general manager of the corporation since its inception in 1920. Harper resigned January 7, due to ill health. Before his appointment as executive vice-president in 1940, Garlent was vice-president in charge of manufacturing at Motor Wheel for five years. He was first elected to the directorate in 1934.

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Arthur L. Gately, member of the firm for 22 years, has been named general traffic manager of the AMERICAN-MARIETTA CO., with general headquarters in Chicago, according to announcement by **Grover M. Hermann,** company president. He assumes his new duties after serving more than three years at the Kankakee, Ill., division as assistant superintendent.

☆ ☆ ☆

Acquisition by the M-R-S MANUFACTURING COMPANY of a new and larger site for the manufacture of Mississippi Wagons was announced recently, when title to a part of the Mississippi Ordnance

Plant at Flora, Miss., was formally transferred to the company by the Reconstruction Finance Corporation. Formerly located in Jackson, the M-R-S Manufacturing Company moved to the Flora plant several weeks ago. The property includes a modern plant structure of 52,400 sq. ft. and an office building of 12,500 sq. ft., providing ample space for all present operations of the company and some for future expansion.

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E. J. Schwanhausser, vice-president of WORTHINGTON PUMP & MACHINERY CORPORATION, was re-elected president of the Diesel Engine Manufacturers Association at the annual meeting held in Chicago. Also returned to their posts as vice-presidents of the Association were **J. E. Peterson,** vice-president of General Machinery Corporation, and **Gordon Lefebvre,** president of Cooper-Bessemer Corporation. **Robert H. Morse, Jr.,** vice-president and general sales manager of Fairbanks, Morse & Co., was again chosen to serve as treasurer.

Directors elected included: **William E. Corrigan,** vice-president of American Locomotive Co., **George W. Codrington,** vice-president of General Motors Corporation and general manager, Cleveland Diesel Engine Division; **A. W. McKinney,** vice-president and general manager of sales, National Supply Co.; **Robert E. Friend,** president, Nordberg Manufacturing Company; **Norris H. Schwenk,** president of Busch-Sulzer Bros. Diesel Engine Co.; and **G. F. Twist,** vice-president and general manager, Atlas Imperial Diesel Engine Company. **Harvey T. Hill,** who for three years has been executive director of Diesel Engine Manufacturers Association, was appointed to continue in that capacity.

☆ ☆ ☆

Because of the addition of new products to its line as well as expanded productive facilities, CATERPILLAR TRACTOR CO., Peoria, Ill., has appointed **W. B. Gordon,** former inventory control manager, to the newly created position of parts consultant. **J. G. Hammer,** formerly parts technical manager, moves up to take Gordon's place as inventory control manager, with **H. F. Haven** promoted from assistant parts manager, Western division, to parts technical manager. **E. L. Mason** takes the Western division post vacated by Haven, while **C. F. Cummings** becomes assistant parts manager of the Central division.

☆ ☆ ☆

Failing health has compelled **J. A. Donnelly,** sales and service vice-president of THE AUTOCAR COMPANY in Chicago, to tender his resignation, it was announced recently by **Edward F. Coogan,** Autocar vice-president. Succeeding Donnelly will be **L. F. B. Reed,** Chicago branch manager for Mack for the past five years. He will take charge of the Autocar Illinois district, with headquarters at the Chicago branch.

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W. H. Hammond, vice-president in charge of sales of GAR WOOD INDUSTRIES, INC., recently announced the addition to his staff of **Robert Whitworth** as division sales coordinator, and **George W. Murphy** in the capacity of branch sales coordinator. Whitworth served during the war as a colonel in the Army, prior to which he had been associated with Great Lakes Steel Corp. Murphy, who served as a major in the Marines, was formerly general sales manager for cereals of the Albers Milling division of the Carnation Co.

Announcement of several organizational changes was made recently by **C. S. Traer,** president of ACME STEEL COMPANY. **C. J. Sharp,** formerly vice-president, director of sales, has been elected to the newly created office of Executive Vice-President. Sales administration of the company's entire line is to be divided into two principal groups, consumer products and producer products. **John Ekern Ott** was named General Manager of Consumer Products, with **Allen B. Wilson** heading Producer Products as General Manager. Other changes include the election of **Guy T. Avery,** former Works Manager, Riverdale Plant, to the newly created office of Vice-President and Manager of Production, with **B. Richards** as his assistant. **W. C. Fork** was appointed Works Manager of the Riverdale plant to succeed Avery, and **F. R. Hyde** was named Superintendent of the Archer plant.

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William L. Aiken has joined SKF INDUSTRIES, INC., as senior division engineer in charge of the automotive and marine department, it was announced by the ball and roller bearing firm. Aiken was executive engineer of the Autocar Co., Ardmore, Pa., before becoming associated with SKF. He is a member of the Society of Automotive Engineers, the American Society for Metals and the Army Ordnance Association.

☆ ☆ ☆

Andrew VanBeek, former assistant director of purchases of the HERCULES POWDER COMPANY, has been appointed director of purchases, succeeding **William J. Austin** who retired December 31. Austin, director of the department since 1942, has been associated with the explosives industry since 1902, and had been with Hercules since 1921. VanBeek joined the company in 1923.

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A further move in the MINNEAPOLIS-HONEYWELL REGULATOR COMPANY'S $4,000,000 expansion program has been disclosed with the announcement of the lease of the two-story Minneapolis building formerly occupied by the Society for the Blind. One floor will house the rapidly expanding Honeywell sales school, the second story becoming headquarters for the research department. The building, located only three blocks from the main plant, will give both research department and school about 50 per cent more space.

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In recognition of his outstanding success in increasing production of heavy-duty Autocar trucks during the past year, **Adolf Gelpke,** production manager since May, 1944, was elected a vice-president of THE AUTOCAR COMPANY, Ardmore, Pa., at the last regular meeting of the Board of Directors. In spite of numerous and prolonged strikes in the plants of essential suppliers which caused critical shortages, the Autocar factory produced 74% of the volume that was projected as being theoretically possible when the year opened. Gelpke has been with the company since 1910.

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The appointments of **Arthur C. Wiebel** as Vice-President in charge of Operations, and **A. B. Haswell** as Vice-President in charge of Engineering, of the TENNESSEE COAL, IRON AND RAILROAD COMPANY, a U. S. Steel subsidiary, were announced recently by **Robert Gregg,** president of the company. Wiebel succeeds **Thomas M. Chalmers,** who retired in January, after forty years of service with the United States Steel Corporation, and Haswell advances from the position of Assistant to Vice-President in charge of Engineering and Construction.

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THE FOUR WHEEL DRIVE AUTO CO. has undergone changes in representative personnel in several middle western states. Lower Michigan and the state of Indiana will be under the supervision of **Oscar Dolberg,** district sales supervisor. Dolberg formerly covered the territory consisting of Ohio and Kentucky. He is succeeded in that territory by **Elmer Porter,** formerly representative in Illinois. **John Youngs,** who formerly supervised the lower Michigan, Indiana territory, was transferred to upper Michigan. **Victor Anderson,** assisted by **Francis Thompson,** will be in charge of the southern part of Illinois, and **Harry Ringdahl,** former specialty salesman in Wisconsin, will handle the metropolitan Chicago area. The states of Missouri and Kansas have been turned over to **C. E. Balun,** formerly administrative assistant to mid-west zone manager **H. G. Engel.**

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Promotion of three veteran members of the PORTLAND CEMENT ASSOCIATION'S scientific research staff was announced by **Dr. A. Allan Bates,** vice-president for research and development. **F. R. McMillan,** director of research since 1927, became assistant to the vice-president for research and development, and **H. F. Gonnerman,** manager of the Association's research laboratory in Chicago for the past 19 years, was promoted to director of research. **William Lerch,** senior research chemist in the Chicago laboratory since 1940, moved up to become manager of the department of applied research.

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Plans are under way for a $1,000,000 expansion of its main works at Aurora, Ill., the INDEPENDENT PNEUMATIC TOOL COMPANY of Chicago announced recently. Site for the expansion has been cleared adjacent to the company's main plant, according to **Neil C. Hurley, Jr.,** president, and construction of an annex providing 85,000 sq. ft. additional floor space will begin shortly. The building program is the latest step of Thor expansion, which has seen the company's chain of factory branch offices extended to twenty.

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Relinquishing his duties as vice-chairman of the board of BUCYRUS-ERIE CO., South Milwaukee, Wis., **George Abbot Morison** will make his home in New Hampshire. He will continue as a member of the executive committee of the board of directors of the firm, however. Morison has been with the company since 1901, having been successively a machinist apprentice, secretary, second vice-president, treasurer, vice-president, and vice-chairman. He has been active in Milwaukee civic affairs for many years.

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John F. Black recently became general superintendent of the Buffalo, N. Y., plant of the WICKWIRE SPENCER STEEL DIVISION of the Colorado Fuel & Iron Corp. Before coming to the plant, he was associated with the Atlas Steels Limited plant at Welland, Ontario, as assistant works manager. Black has been director-at-large of the Association of Iron and Steel Engineers during 1946, and will act as secretary in 1947.

Thomas Robins, Jr., president of HEWITT ROBINS, INC., of Buffalo, N. Y., and **Lester H. Buttenheim**, president of McKiernan-Terry Corp. of Harrison, N. J., recently announced an agreement under which McKiernan-Terry has acquired the good will, drawings, jigs, fixtures, and spare parts of the Mead-Morrison Div. of Robins Conveyors, Inc. The two companies will cooperate in carrying out important harbor facility projects involving bulk materials handling equipment problems.

☆ ☆ ☆

LINK-BELT SPEEDER CORP. recently announced that **Hayes Parsons** had been made assistant to the president and will have charge of the domestic sales of the company's "Shovel-Cranes." His headquarters will be Cedar Rapids, Iowa. Parsons was with the company from 1925 to 1945, when he was forced to retire because of ill health. Since then he has recovered and is once again actively concerned with the sale of Link-Belt equipment.

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Announcement was made recently of the election of **Harvey T. Gracely**, well known in the power shovel industry, as president and general manager of MARION POWER SHOVEL CO., Marion, Ohio. Gracely began his association with the company in 1901 when he accepted employment in one of the factory stock rooms. Since then, he has worked at engine subassembly, as a draftsman, as chief engineer, and as advertising manager and general sales manager. In 1944 Gracely was elected to the board of directors and a year later was made a vice-president. He succeeds **M. E. Montrose** as president and general manager.

NEW EQUIPMENT

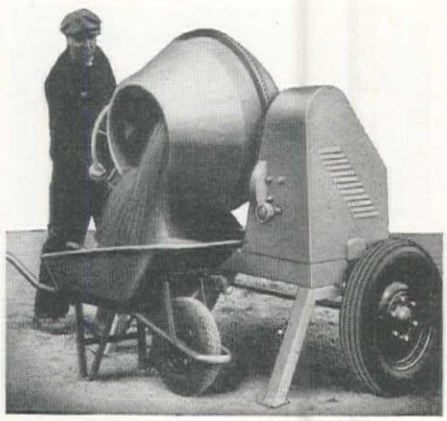
MORE COMPLETE information on any of the new products or equipment briefly described on these pages may be had by sending your request to the Advertising Manager, Western Construction News, 503 Market Street, San Francisco 5, California.

End Discharge Concrete Mixer

Manufacturer: Kwik-Mix Company, Port Washington, Wisc.

Equipment: Improved end discharge concrete mixer.

Features claimed: This improved 3½-S Dandie end discharge mixer leaves wheelbarrow spotting area unobstructed, eliminates turning and backing with loaded wheelbarrow. Wheels run on anti-friction bearings, and leaf springs enable the end tilter to trail fast. Air-cooled engine won't freeze in winter, heat up in summer. The big hand wheel makes it easy to tilt loaded drum for discharge. Hand spotting is made easier by pushing the tow pole down, not up, to move the end tilter.



Automatic Taglines

Manufacturer: Westfall Taglines, Los Angeles, Calif.

Equipment: Center pull automatic taglines.

Features claimed: Designed for use in every type of clamshell and concrete bucket work, the center pull automatic tagline will prevent line fouling and bucket turning under the toughest conditions. Due to its construction, model 300 maintains sufficient tension to steady clamshell buckets from ⅜ cu. yd. to ⅝ cu. yd. For heavier units up to 1¼ cu. yd. capacity, the model 600 is recommended for maintaining proper tension. The tagline operates on a highly tempered ribbon type spring of finest quality, mounted on factory sealed roller bearings encased in a dust-proof container. The spring retains its original factory temper because no heating or bending is required for its installation. Spring ends are held by wedge-type, self-adjusting sockets, thereby reducing fatigue and stress to a minimum.

The spring is so designed that when required tension has been wound, the pull-out remains practically the same from the fairlead to extreme of pull-out. The line can be installed in 30 minutes, being mounted on either side or in the center of the boom, depending on the location desired by the operator.

Truck Mixer

Manufacturer: T. L. Smith Co., Milwaukee, Wisc.

Equipment: Improved model truck mixer.

Features claimed: This new model Smith-Mobile Truck Mixer claims substantial improvements over other models, larger drums with increased capacities being paramount. Other refinements include: selective dual water injection system for

job mixing or mixing in transit; fully-enclosed water pump valve and piping within motor housing; siphon-type water tank equipped with a single lever-operated, poppet-type, three-way valve; self-adjusting metal sealing door which automatically compensates for wear. Four sizes are available: 2 yd., 3 yd., 4½ yd., and 5½ yd. Truck Mixers; 3 yd., 4¼ yd., 6⅛ yd. and 7⅜ yd. Agitators.

Positive Printing Machine

Manufacturer: Ozalid, Division of General Aniline & Film Corp., Johnson City, N. Y.

Equipment: New positive printing, dry developing machine.

Features claimed: Designed to meet the printmaking requirements of organizations of any type, the Streamliner reproduces

drawn, typed, printed, or photographic material in 25 sec. Prints are delivered completely dry, ready for immediate use after only two operations: exposure and dry development. Controls are within easy reach of the operator, who will be aided by such devices as the impeller pump which automatically drives the 20 per cent solution of baume ammonia from storage bottle to evaporation tray, the newly designed speed transmission, reverse speed, simplified drive, and ready accessibility of all working parts. The machine is of aluminum-steel construction.

Improved Concrete Hauler

Manufacturer: Maxon Construction Co., Dumpcrete Division, Dayton, O.

Equipment: Truck body for hauling concrete.

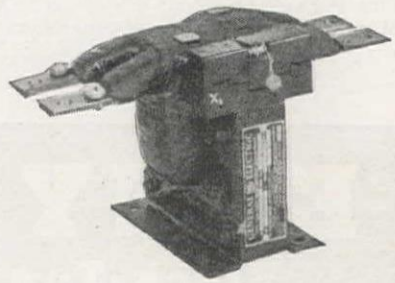
Features claimed: The improved Dumpcrete truck body, specially designed for the hauling and placing of air-entrained concrete, features a 90-deg. dumping angle, positive cut-off gate, and lower center of gravity. The Dumpcrete not only has a folding chute with 180-deg. horizontal swing and full vertical adjustment, but rounded interior corners, deflector plates, inverted center keel and adjustable baffle aid clean discharge. High discharge is 6 ft., 3 in. for the 4-cu. yd. size, 4 ft., 9 in. for the 2-cu. yd. size. The entire body is welded of high tensile alloy steel.

Indoor Current Transformer

Manufacturer: Meter and Instrument Division of the General Electric Co.

Equipment: New 1200-volt indoor current transformer.

Features claimed: Designated type JL-6, the new transformer is available in primary current ratings 10//10 to 400//400 amperes, and has been assigned a 30-kv full-wave



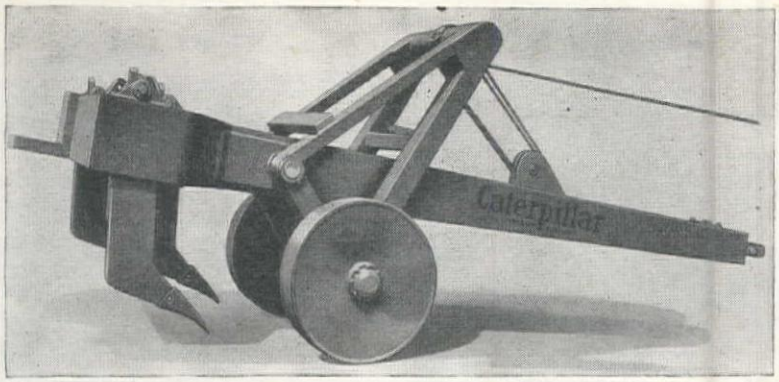
rating. Spacing between the primary terminals is 1½ in. for all current ratings, which is adequate even for oversize cable lug connections. The unit has been designed for metering service on three-wire, single-phase indoor circuits.

Testing Machine

Manufacturer: Baldwin Locomotive Works, Philadelphia, Pa.

Equipment: Fatigue and simulated service testing machine.

Features claimed: The Sonntage Model SF-2 bench-type fatigue testing machine embodies the "constant-force" loading feature, and affords flexure fatigue tests on sheet stock of any material—metal, plastic, or wood. Unique design eliminates need for any electronic equipment, complex linkage or special device to maintain a constant force while specimen is under test. A revolving eccentric mass is used as a means of loading the specimen, avoiding cams of eccentric connecting rods which often require readjustment of the machine. Because of its relatively small size, 15 in. x 12 in. x 32 in., the SF-2 can be placed in a cabinet during the test so that temperature and humidity can be controlled. Machine weighs 115 lbs., has an alternating force capacity of 20 lbs. and speed of 1800 cycles per minute with a total travel of the loading yoke of one inch per cycle.



Cable Operated Rippers

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Equipment: No. 28 and No. 18 cable operated rippers.

Features claimed: No. 28 is built for use with one or two D8 tractors, and No. 18 for use with a single D7 or D8 tractor. Both model rippers are equipped with three teeth which are detachable in the event less than that number are required on the job. Replaceable tips of the teeth are of heat-treated alloy. While maximum depths of penetration are 28" for the No. 18, and 30" for the No. 28, accurate control permits the operator to rip material to any depth up to the maximum. Proper tooth angle and weight distribution give penetration on the hardest materials. The rippers are operated by a rear cable control on the tractor. Sheaves are 9¾" in diameter and eighty feet of ½" cable is required for operation.

Shovel, Crane and Dragline

Manufacturer: Lima Locomotive Works, Inc., Shovel and Crane Div., Lima, Ohio.

Equipment: 1½-cu. yd. shovel, crane and dragline.

Features claimed: This Type 604 has a box-type boom, electrically welded steel construction with wide flaring base. The dipper handle is a single unit with one-piece racking, and the dipper is full 1½-cu. yd. capacity. Type 604 has an independent chain crowd, and, when working as a crane, has a capacity of 30 tons at 12-ft. radius. The crawler truck construction is the small, dolly roller type with end drive principle. The truck base is a one-piece casting with center pintle, axle supports, conical roller path and gear case cast integral. Four conical hook rollers, equally spaced, support the rotating unit. The type 604 is equipped with "Precision" air control on all major functions including steering, swinging, hoisting, crowding and retracting, boom hoist, dipper trip, shift from swing to propel and the swing brake. The power plant consists of either a Diesel engine or electric motor of approved make.

Folding Spectacles

Manufacturer: Watchemoket Optical Co., Inc., Providence, R. I.

Equipment: Sto-aways — a new, all-plastic folding safety spectacle.

Features claimed: The semi-rimless type frame is hinged to fold at the bridge. A

new type of hollow, stainless-steel temple telescopes to 1/3 the normal length. The entire goggle folds to the size of a pack of cigarettes. Lenses are of shatterproof Impax plastic, especially resistant to high-velocity impact. Clear or green-tinted lenses are instantly interchangeable, and are locked rigidly in the deep-channeled Plexene plastic frame. The hinge between the temple and the frame will lock automatically in open position, and temples are available in 3 different lengths.

Universal Drive Pump

Manufacturer: Barnes Manufacturing Co., Mansfield, Ohio.

Equipment: New Universal Drive Automatic Centrifugal Pump.

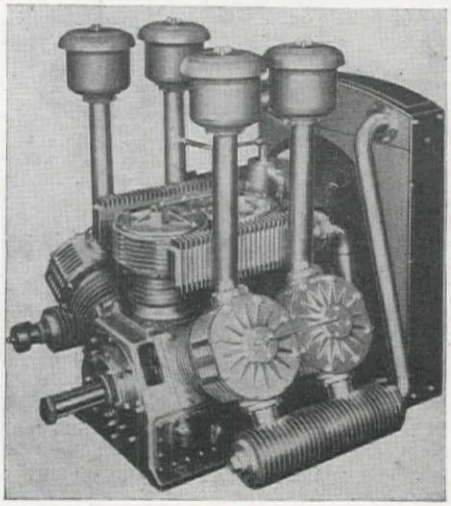
Features claimed: This new unit, Model 3MU, with 1½-in. suction discharge has a capacity up to 5700 gallons per hr. and pressure up to 35 lbs. per sq. in. It incorporates all standard Barnes features including automatic prime, and can be driven from any available power source which the user may already have. The pump is equipped with a heavy-duty coupling head, incorporating double ball bearings. The shaft is of highly polished, case hardened steel, mounted on ball bearings to carry the radial load. Available as an accessory is a type A, 2-groove ¾-in. bore pulley for belt driven applications.

Portable Compressors

Manufacturer: Davey Compressor Company, Kent, Ohio.

Equipment: Five new model air-cooled portable compressors.

Features claimed: To mark the 25th anniversary of its introduction of the world's first air-cooled portable compressor, this company has recently introduced five new models of 60-105-160-210-315 c.f.m. capacity. All units are of V-type cylinder design, except the Model 315. The latter is of "W" construction with four low pressure and two high pressure cylinders. Units operate



at relatively slow piston speeds through the use of short piston strokes. Cooler compressor operation and permanent freedom from valve carbonizing is made possible through the use of aluminum alloy compressor heads and manifolds on all models. Other features include crankshaft mounting on heavy duty double row ball bearings, full force feed lubrication and individual air cleaners for each low pressure cylinder.

Automatic Electrodes

Manufacturer: Wilson Welder & Metals Co., New York, N. Y.

Equipment: Knurled type wires and flux impregnated tapes.

Features claimed: Five Una automatic wires and five Una tapes have just been introduced by this company. Designed for flat position operation, their applications on the assembly line are many and varied. Meeting the requirements for high speed fabrication, they are available in several diameters and alloy analyses. Depending upon the application, the automatic wires may be used separately or in conjunction with the tapes.

Small Hydraulic Couplings

Manufacturer: Twin Disc Clutch Co., Rockford, Ill.

Equipment: Six couplings in a new series, ranging from one to 25 hp.

Features claimed: All but the smallest of this new line of hydraulic couplings retain in their design the customary twin disc double circuit, which consists of two sets of blades on both the driving and driven members of the coupling. This design permits the greatest horsepower capacity per inch of coupling diameter and, at the same time, produces a hydraulically balanced unit. A simple form of design has made the coupling a very compact unit and one which will not present difficulty in installation. Both the impeller, or driving member, and the runner, or driven member, are light-

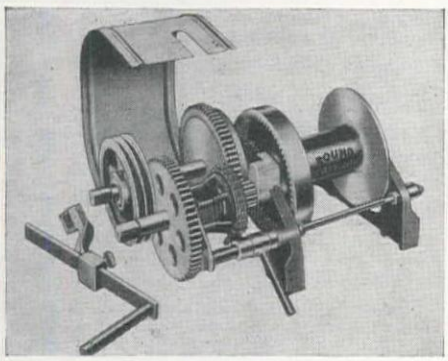
weight aluminum castings. A cast iron insert forms the hub of the driven member, taking the drive to the output shaft. Stamped steel core rings in both the impeller and the runner form the hydraulic circuit. The new couplings assure smooth acceleration, prevent stalling, allow the engine or motor to be fitted to actual running requirements, eliminate the need for shear pins and similar "break-and-replace" protection for driven parts, distribute the load on multiple engine or motor drives, permit the reversing of electric motors at full-load speed without high current surges, and, in case of a standard motor, permit the motor to start under no load and thus make high torque available for starting.

Power Winch

Manufacturer: David Round & Son., Cleveland, Ohio.

Equipment: Five-tons capacity power winch.

Features claimed: The Round No. 102, as this winch is known, is fitted with a V-belt pulley and connected to a 2 hp. reversible type motor. Intended for general industrial and construction use, it is particularly recommended as a car puller for spotting railway cars and as a boat hoist. It is equipped with an automatic friction disc-type brake, and pawl may be lifted from ratchet by means of counter-weighted lever releasing friction brake and permitting cable to be run out as rapidly as desired. Crank is supplied with the winch for use in case of power failure.



Cable Control

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Equipment: Rear-mounted double drum cable control unit.

Features claimed: Designed for use with Caterpillar Diesel D6 and D7 tractors, the new cable control is designated as the No. 23. It provides smooth, easy operation with a minimum of adjustments, developing line pulls ample to meet service requirements imposed by the operation of scrapers, bulldozers and rippers. The No. 23 offers all the features of the No. 25 rear double drum cable control and the No. 24 single drum, front-mounted control.

Stop-Fire Extinguisher

Manufacturer: Union Stop-Fire Corp., Brooklyn, N. Y.

Equipment: Stored-pressure hand extinguisher.

Features claimed: The fluid tank is suspended by a shoulder sling, eliminating the possibility of spoiled aim. All the user has to do is point the flexible hose at the fire and give the readily accessible valve a quick flick with the fingers, releasing an instantaneous stream of fluid. Carbon dioxide is combined with carbon tetrachloride to produce a chemical of extraordinary effectiveness in putting out fires. Shot as a fine spray from the hose, this doubly effective chemical is converted into a heavy, fire-smothering gas. Even fires of the most stubborn kind—oil, ether, gasoline, electrical—are blanketed and snuffed out in a matter of seconds. The extinguisher has a long range, the bulk of the stream traveling anywhere from 15 to 25 ft. An attached pressure gauge indicates fluid pressure at all times. The extinguishers are manufactured of 85-15 brass, are non-corrosive, and there is no possibility of zinc oxidation. Absence of moving parts makes the stop-fire instantly usable whenever needed, since there is nothing to get out of order.

Diesel Power Units

Manufacturer: International Harvester Co., Industrial Power Division, Chicago, Ill.

Equipment: Two new diesel power units.

Features claimed: Both new units are heavy-duty four-cycle Diesels with the same bore and stroke. The 125-hp. UD-18A has six 4¾ x 6½-in. cylinders, and the 76 hp. UD-14A has four. A new cylinder head arrangement, improved nozzles, and redesigned precombustion chambers give them higher compression and greater efficiency in converting fuel energy into low-cost power. These models deliver considerably more power with no increase in weight over the UD-18 and UD-14, which they replace. Volumetric efficiency or "breathing" ability, is greatly increased resulting in more lugging ability and greater power output with clean combustion. International's integral gasoline starting system has been retained in both Diesels.

Giant Tamper

Manufacturer: Wm. Bros Boiler & Manufacturing Co., Minneapolis, Minn.

Equipment: Heavy duty tamping roller.

Features claimed: Earth compaction of more than 800 lbs. per sq. in. is a principal feature of this Model G-2, designed to meet a need emphasized by wartime neglect of highways. It applies 335 lb. per sq. in. when empty and can be used at any weight up to the 800 lb. maximum. The tamper meets a wide range of compaction requirements, the average pressure on each foot varying as follows: empty drums, 2,330 lb.; water

filled drums, 4,000 lb., and wet sand filled drums, 5,660 lb. The oscillating type roller consists of two 76-in. drums, designed around a full-floating pole. This allows for full individual drum oscillation, with either angular or parallel lifting. The tamper has been constructed to penetrate to the bottom of the soil layer and start its compaction from the bottom.

Radial Arm Saw

Manufacturer: Equipment Engineering Co., Division of Nall Corp., St. Charles, Ill.

Equipment: New radial woodworker.

Features claimed: The Nall radial woodworker's new design and construction features make for simplicity of operation. It will handle any sawing operation possible

with heavier machines in less time. Changes from one operation to another can be made in less than a minute. Other features are the frictionless carriage, new indexing and locking mechanisms, and dust-sealed parts. Construction employs both cast aluminum and welded pressed steel. Controls are all within easy reach of the operator.

Unit Type Apron Feeder

Manufacturer: Pioneer Engineering Works, Inc., Minneapolis, Minn.

Equipment: Three types of apron feeders.

Features claimed: Built around a unit assembly without sideboards, the feeder also can be ordered with vertical or with flared sideboards. Each of these models can be furnished with any one of three drives; for gear motor, conveyor drive, or drive from the crusher. These nine combinations of the feeder can be secured in 5 lengths, from 6 ft. to 14 ft., and in 4 widths from 30 in. to 48 in. Illustration shows a 14-ft. heavy duty feeder. Pans are ½-in. forged steel plate, formed to overlap to impart great strength and rigidity. Together with the side-boards, they provide a continuous path for materials and reduce spillage. The corrugated surface provided prevents slippage under the load.

Self Priming Centrifugal Pumps

Manufacturer: Chain Belt Co., Milwaukee, Wisc.

Equipment: Centrifugal pumps.

Features claimed: This new line of Rex Press-formed Self Priming pumps is formed of Armco Ingot Iron which is highly resistant to corrosion. The new tool resists cracking or shattering under heavy blows or in freezing weather. In addition there is a large saving in weight, the 2-lb. pump weighing 90 lbs. less than the former cast iron design. Other features include improved pumping efficiency, due to the smooth surface of the pump and press-formed volute, and an improved and faster method of priming.

New Tractor Shovel

Manufacturer: Tractomotive Corporation, Findlay, Ohio.

Equipment: Shovel for general excavation and dirt-moving.

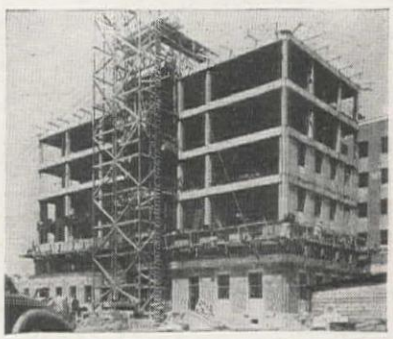
Features claimed: The Model TS-5 Tracto-Shovel, the first in a line of tractor equipment, is designed for use on the Allis-Chalmers HD-5 long track, rigid truck frame Diesel tractor. Its hydraulically-controlled bucket is operated by double-acting lift and dumping cylinders, designed to provide adequate down pressure and controlled dumping and closing of the bucket. The bucket had an automatic tilt-back to prevent spillage. Overall length is 14 ft., 6 in. The shovel frames are mounted directly to the tractor and contain a 25-gal. capacity oil reservoir.

Scaffold Equipment

Manufacturer: Superior Scaffold Sales Co., Waterloo, Iowa.

Equipment: Time-saving scaffold equipment.

Features claimed: Model "B", 5 ft., 8 in. wide, boasts a raised material platform which keeps materials at the highly paid mechanic's finger tips instead of at his feet. This, together with the removal of cable and drums behind him away from the



wall, will save an hour a day, it is claimed. Model "A", 8 ft., 4 in. wide, incorporates all the features of Model "B", as well as being wide enough to transport materials along the outside edge. Model "C", a light cleaning and tuckpointing type, may be hung from any structure. "Superior," a sectional scaffold for masonry work, is also available.

Vibratory Screed

Manufacturer: Electric Tamper and Equipment Co., Ludington, Mich.

Equipment: Model SC-200A Jackson vibratory hand screed.

Features claimed: The screed members are made of wood which serves as the ideal transmitter of vibratory energy, and the screed acts as a mechanical strike-off. The vibrations imparted by the vibratory motor through the screed members and into the concrete, solidly compact the concrete and bring to the surface a high grade finishing mortar. A most important feature of this new screed is that it has a tendency to

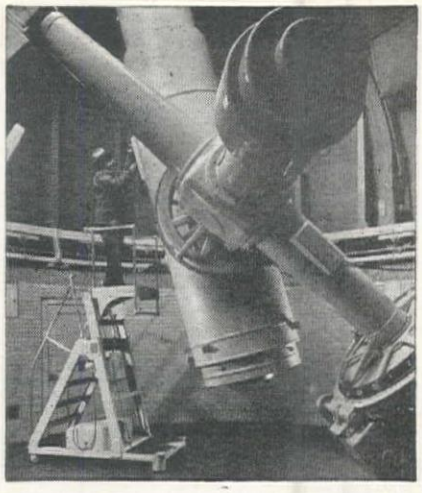
propel itself forward, greatly reducing the pulling effort required. When used in connection with a model M-1 Jackson portable power unit, a wide range of vibratory frequencies are available for more readily and uniformly placing concrete of various mix designs. The new model FS-7A electric motor driven flexible shaft concrete vibrator is extremely useful for consolidating joints and edges. It is powered by a 1¼ hp. motor capable of producing vibratory frequencies of between 6500 and 9000 rpm. when submerged in concrete.

Lift Platform

Manufacturer: Elwell-Parker Electric Co., Cleveland, O.

Equipment: Electrically operated observation platform.

Features claimed: It is unique in that it has two platforms, one stationary at a height of 5 ft., the other adapted to be raised or lowered automatically within a range of 8 ft. above the floor, providing for observation at 13 ft. and adjustments at 15 ft. Built mainly of aluminum alloy and mounted on ball-bearing, rubber-tired wheels, the lift is easily moved by one man in places where material or equipment and worker must be elevated and where security is essential. The base of the truck is 3 x 6 ft. Electric motor, reduction gear and winding drum for hoist cables are enclosed and mounted compactly on this base. Current for the motor is supplied through a flexible line from the building circuit. Upper structure is an assembly of two A-frames with a top plate forming a stationary platform, 7 x 30 in. Joining the two frames on one side are four cross members which serve to reinforce the structure and



also as steps leading to the stationary platform. Capacity of the elevating platform is 500 lb. Its movement may be started or stopped at any height by means of a small toggle switch or push button on the platform's guard rail. Type 61-S-T aluminum alloy, heat treated, is used for all structural members, reinforced, riveted and welded into a rigid assembly.

Scraper Plane

Manufacturer: BE-GE Manufacturing Co., Gilroy, Calif.

Equipment: Dual-purpose land-levelling plane.

Features claimed: The BE-GE Scraper Plane is actually a dual-purpose machine which cuts hard ground like a conventional Scraper while planing the surface. Slightly over 45 ft. long, it is easily transported and handled by one man. The Scraper Plane pivots on its two middle wheels instead of its bucket, actually using less drawbar pull than on straightaway and turning as accurately with the bucket empty as when filled. Other features include the hydraulically actuated bucket which dumps material by a simple movement of the control lever of the tractor, and the rubber tired dual wheels. On long hauls through cities the Scraper Plane can be telescoped to 2/3 of its 45-ft. length.

P&H Soil Stabilizer

Manufacturer: Harnischfeger Corp., Milwaukee, Wis.

Equipment: New P&H single pass soil stabilizer.

Features claimed: Designed to make use of on-the-spot materials in building subgrades, secondary roads, airports, etc., the machine draws its name from its ability to perform all stabilizing operations in a single pass. These operations include shaving and pulverizing the in-place material; thorough blending; application of liquids; final mixing; and spreading to a uniform depth.

New Plastic Glazing

Manufacturer: The Richkraft Co., Chicago, Ill.

Equipment: New plastic glazing material.

Features claimed: Richglaze, a material which admits over 60 per cent of the sun's

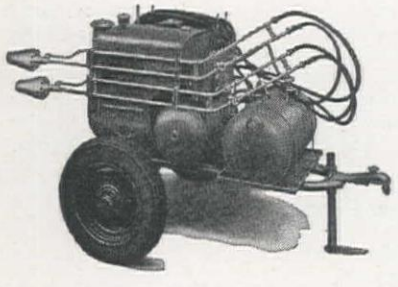
ultra-violet rays, is designed for use wherever it is desirable to admit light and provide a weather barrier. Made by laminating a lightweight cord net between two sheets of cellulose acetate, Richglaze is said to be transparent, waterproof, flexible and shatterproof. It is expected to be particularly advantageous for poultry houses, barns, cold frames, and as heat and dust barriers in greenhouses, warehouses, and factories. Rolls 36 in. wide are furnished in 150 sq. ft. and 450 sq. ft. sizes.

Power Driven Burner

Manufacturer: Aeroil Products Co., West New York, N. J.

Equipment: New postwar power driven burner.

Features claimed: The Aeroil-Schramm Power Burner is a packaged machine, without gears, belts or chains; self-starting; and



with a portable flame production estimated to be far in excess of any unit of comparable size and price of pre-war manufacture. Type of burners makes it possible to work in vertical as well as horizontal position. Any type and length of flame can be produced, from 6 in. to 15 ft. long. Requires no special fuel, but will operate on kerosene or any oil up to a No. 3 fuel oil. Industrial uses could be such work as straightening, bending, shrinking, and expanding; skin drying foundry moulds, heating plates, ribs, girders, etc., and for general repair work in boiler shops, car shops, railroad shops, etc.

Shovel, Dragline, Clamshell, Crane

Manufacturer: Marion Power Shovel Co., Marion, Ohio.

Equipment: Heavy-duty shovel, dragline, clamshell and crane.

Features claimed: A full-rated 2½-cu. yd. machine designed for mining, quarrying and large-scale construction projects, the Marion 93-M features Marion air control, ease of convertibility to dragline, clamshell and crane service. Simplicity and accessibility of all machinery and moving parts, and careful proportioning for heavy-duty service are also claimed. Shovel front-end equipment includes an all-welded, rounded-edge, box section boom, twin welded full box section dipper handles and a heavy duty manganese-steel-front dipper with inserted, socket-type dipper teeth. Varying boom lengths and bucket combinations are available as job conditions may require.

Chisel-Type Percussion Bits

Manufacturer: Kennametal Inc., Latrobe, Pa.

Equipment: Percussion bits with Kennametal cutting edges.

Features claimed: A new percussion bit of chisel-type design, the instrument is driven by pneumatic percussion drilling machines and may be used for drilling holes in hard rock. Up until its manufacture, no cemented carbide bit had been developed that would withstand the impact of air hammers using air pressures of 80 to 120 lb. per sq. in. It is claimed this instrument can drill a total of 50 ft. of holes 1⅜-in. in diameter before it is taken off the driving rod because of wear. Hole sizes at the end of the drilling were approximately the same size as those at the start. By removing the bit and resharpening it, the bit would be good for more footage.

Automatic Electrodes

Manufacturer: Air Reduction Sales Co., New York City, N. Y.

Equipment: Line of automatic arc welding wires and tapes.

Features claimed: This new line embraces five knurled type wires and five tapes all for flat position operation and all highly recommended for low cost, uniform, automatic welding. Their applications on the production line are many, ranging from thin gauge sheet metal forms to boilers, axle housings, and torque tubes. All Airco wires and tapes have been subjected to extensive laboratory tests as well as practical "on the job" examinations. They are manufactured in several diameters and are designed to meet the general requirements of high speed production welding. These automatic wires may be used separately or in conjunction with the tapes depending upon the job to be performed.

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.

CEDAR RAPIDS HAMMERMILL SCREENING AND CRUSHING PLANTS — **Iowa Manufacturing Co.**, Cedar Rapids, Iowa, recently issued several bulletins on the Hammermill screening and crushing plants, as well as the Cedarapids portable power unit. Pictures, diagrams, and statistics accompany the text. Information on a portable bin unit is also available in bulletin form.

PRODUCTION ROAD—HYDRAULIC COUPLING ISSUE — **The Twin Disc Clutch Co.**, Rockford, Ill., has devoted the latest issue of the company magazine exclusively to photographs, charts, and short articles relating the complete story of the company's newest product, a small hydraulic coupling, tested for more than a year on electric motors and internal combustion engines in the 1 to 25 hp. range. Illustrated articles describe the six major advantages derived by teaming the small hydraulic coupling with power units. This issue of the magazine was prepared under the direction of Roger G. DeLong, sales manager of the Hydraulic Division of the Twin Disc Clutch Co.

BJ SUBMERSIBLE PUMPS — **Byron Jackson Co.**, Los Angeles, Calif., has just released a new 12-page bulletin (No. 46-5000) on their deepwell turbine pump and electric motor unit known as the Submersible Pump, a motor pump unit which operates entirely submerged in water at any depth, for pumping applications requiring capacities of 7,000 gpm and heads to 1500 ft. Printed and illustrated in three colors with photographs, parts diagrams and tabular data, the bulletin covers specifically Submersible Pumps Type "B" for relative low capacities, high speed operations; "K" for general deepwell applications; and "R" for relatively high capacities, low head operations.

AUTOMATIC CONTROL OF RADIANT PANEL HEATING — **Minneapolis Honeywell Control Systems**, Minneapolis, Minn., has published a 39-page booklet on automatic control of panel heating. The recent publication gives in detail the theory of control of panel heating, as well as control requirements, and application of

controls to panel heating. The text is supplemented by complete diagrams and graphs and an outline of control procedure is contained in the back.

FOUR-WHEEL-DRIVE TRUCKS FOR HEAVY DUTY SERVICE — **Four Wheel Drive Auto Co.,** Clintonville, Wis., has published an illustrated pamphlet showing in detail the heavy duty "U" series engine, heavy duty units of construction, and other features of the "U" series heavy duty four-wheel-drive trucks. Different types of hauling jobs for which these trucks are suitable are also shown. Five-speed transmission, the free-working manually locking center differential, deflection proof housings and other features are also illustrated in the pamphlet.

COMPLETE UNIT DRIVE — **Link-Belt Company,** Chicago, Ill., has issued a 16-page booklet announcing its new Electrofluid Drive "packaged" power unit. It consists of a general purpose induction motor, flange-mounted to a housing and a hydraulic coupling. It is an integral unit ready to connect to your power line and the equipment to be driven. The electrofluid Drive can be applied to agitators, blowers, compressors, conveyors, cranes and hoists, crushers, machine tools, screens, pumps, in the oil industry, to list a few of its uses. Specifications and illustrations complete the information given in this booklet.

E-M HEAVY-DUTY, SQUIRREL-CAGE INDUCTION MOTORS — **Electric Machinery Manufacturing Co.,** Minneapolis, Minn., recently released publication No. 188, a die-cut 4-page folder in three colors, which shows cut-away views and details of the construction of new E-M heavy-duty squirrel-cage induction motors designed for drip and splash-proof construction in large-power ratings from 100 to 1000 hp., 1800 rpm. and lower.

1947 NELSON STUD WELDING DATA BOOK AND CATALOG—**The Nelson Sales Corp.,** Lorain, O., has published a new 36-page data book and catalog, designed to provide factual information on the use of automatic stud welding. The stud welding process, equipment and studs are fully described and illustrated. Complete information on designing for stud welding is given, together with full specifications and physical properties data on Nelson flux-filled studs. Final section of the book is devoted to a description of typical stud welding applications in automotive, contracting and construction, boiler and tank, railroad, and other fields.

CATALOG OF BASIC MODELS FOR 1947 — **Elwell-Parker Electric Co.,** Cleveland, O., builder of power industrial trucks and cranes, recently issued a new catalog, which gives illustrations and principal specifications for 31 models. Included in the group are low-lift, with and without crane units; high-lift platform trucks; fork-type cranes; stationary-bed load carriers and tractors. All are available with either electric or gas-electric power. Also illustrated are fork-type trucks equipped with some of the modern interchangeable devices such as rotating roll-handlers and rams.

BULLETIN 467 G — **Universal Engineering Corp.,** Cedar Rapids, Iowa, has published a 16-page bulletin which pictures and describes Universal crushing, pulverizing, conveyor, screening and washing equipment. The publication covers the entire Universal line including portable plants and basic units, and pictures typical installations together with flow of material diagrams.

ALLIS-CHALMERS WHEEL TRACTOR—**Allis-Chalmers Manufacturing Co.,** Tractor Division, Milwaukee, Wis., recently put out a four-page bulletin listing features of its Model B wheel tractor with industrial mower. Complete pictures of the tractor as well as close-up shots of important parts and pictures of the machine in action are included. Specifications for the 16.31 hp. Model B tractor are listed in detail on the back page of the bulletin, MS-419.

CONTRACTOR IN THE PACIFIC NORTHWEST—**Donald M. Drake Company** of Portland, Ore., has published an attractive broadside that pictorially and editorially tells the story of twenty-five years of building activity carried on by the Drake Company in the Pacific Northwest. As is stated in the broadside "This exhibit is intended to direct the attention of fellow Americans here and in other sections of our country to the opportunities offered them in the great Pacific Northwest."

SMALL HYDRAULIC COUPLINGS —**Twin Disc Clutch Co.,** of Racine, Wis., has published a 16-page booklet devoted exclusively to the new series of small hydraulic couplings for application to electric motors and internal combustion engines in the 1 to 25 hp. range. These couplings supplement the already established line of heavy-duty Twin Disc Hydraulic Couplings and retain all of the same features that for many installations assure smooth operation, greater flexibility, easier maintenance and many other advantages obtainable with this type of power-connecting link. Exploded and cut-away views as well as job photographs amply illustrate the booklet.

WESTERN STEEL — **Columbia Steel Co.** of San Francisco, Calif., has published a 58-page booklet describing the western inspection tour taken by members of the Board of Directors of the United States Steel Corporation recently. The history of the steel plant at Geneva, Utah, is also briefly told.

HOSE MASKS AND AIR BLOWERS —**Mine Safety Appliances Company,** Pittsburgh, Pa., have recently issued a new 6-page bulletin giving complete information on hose masks and auxiliary equipment. The masks are designed to safeguard workmen where high concentrations of gas or insufficient quantities of oxygen exist, such as in tanks, tank cars, tank ships, ship holds, vats, sewers, in street and plant work, around blast furnaces and in similar confined areas. The bulletin includes complete information on combination hose masks with double inhalation tubes for extra protection. In case of constriction of one tube, the other supplies a free flow of air to the wearer. The hose of the combination mask passes over the shoulders, giving freedom of head and body movement.

PIPE IN AMERICA—**American Iron and Steel Institute,** New York, N. Y., have published "Pipe in American Life," a 48-page illustrated booklet, presenting the historical background and modern uses of metal pipe, with emphasis on the use of steel pipe. Chapters are devoted to the uses of steel pipe in homes, large buildings, process industries, railroads, shipping, mining, water supply systems, the oil industry, the gas industry, refrigeration, irrigation and on farms. Much of the material has not previously been available as general information.

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SOUTHERN DISTRICT OF CALIFORNIA
CENTRAL DIVISION
In Bankruptcy No. 43,980-H
In the Matter of
SHANNAHAN BROTHERS, INC., a corporation,
Bankrupt.

NOTICE OF BANKRUPT SALE

NOTICE IS HEREBY GIVEN that the undersigned Trustee will, on
MONDAY, MARCH 31st, 1947, at 2:00 P.M.
in the Court Room of Hon. Benno M. Brink, Referee in Bankruptcy, 327 Federal Bldg., 312 N. Spring St., Los Angeles
offer for sale to the highest bidder or bidders therefor,

AN OPERATING QUARRY FOR THE PRODUCTION OF RIVERSIDE GRANITE AND RIP-RAP STONE

being approximately *460 ACRES* of real property and including
One 650 C.F. STATIONARY COMPRESSOR
DRILLS, AIR EQUIPMENT & MISC. TOOLS
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INSPECTION: From March 26, 1947
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Terms of sale: A certified check for 25% of the amount bid must be deposited on award of bid, and balance on delivery of property immediately following sale.
Right reserved to reject any and all bids and to continue or postpone the sale without assigning any reason therefor.
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MODEL 1055 L.C. DIESEL DRAGLINES
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