

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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Re-Designed Conveyor Unit

At Anderson Ranch Dam in Idaho

New Engineering Study

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Clear Creek Highway Developed

Eastshore Freeway

Marsh Land Roadbed Stabilized

Future A.G.C. President

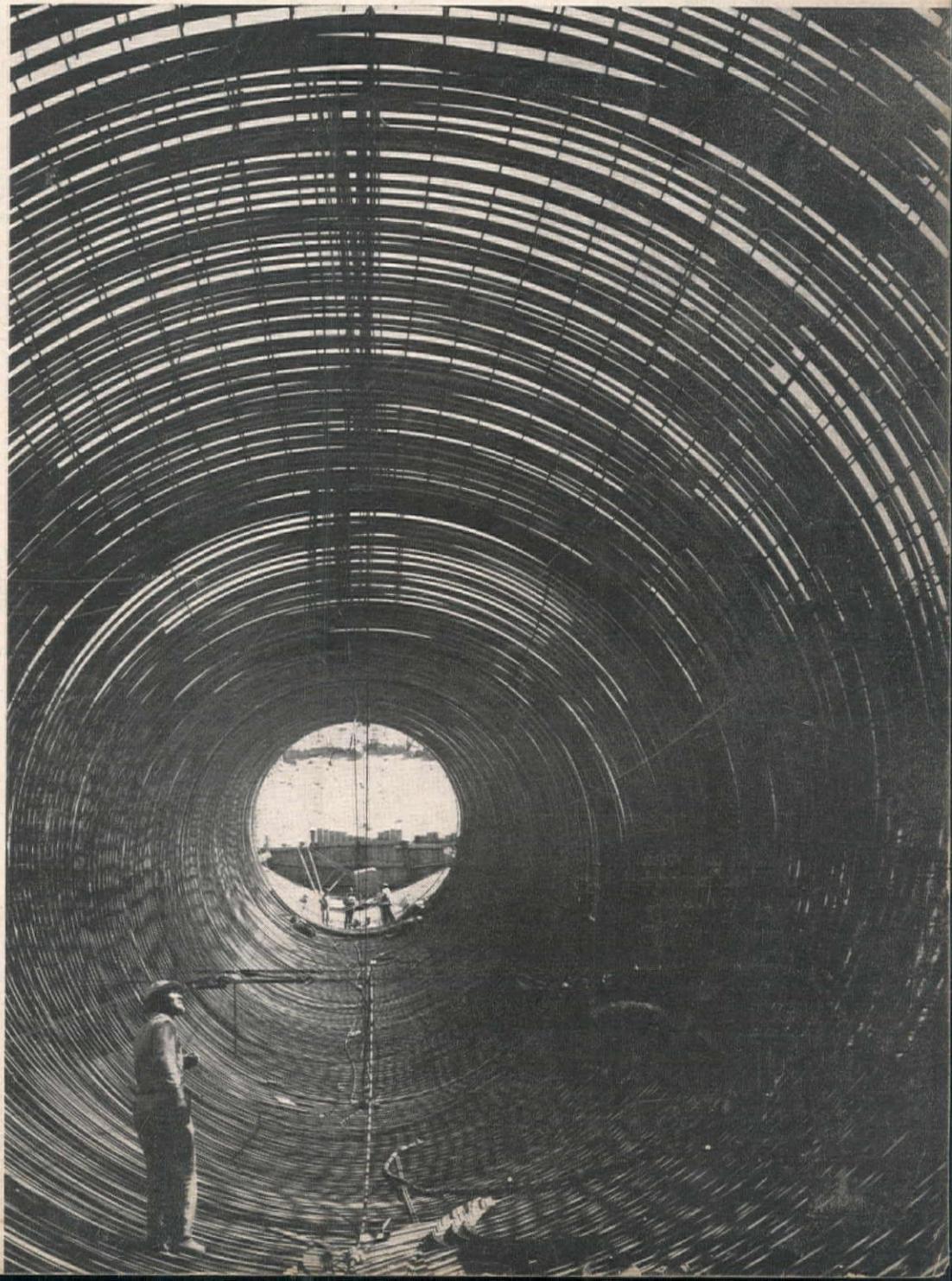
Portrait of Adolph Teichert, Jr.

1948 Officer Roster

Leaders of Major Western Groups

GIANT STEEL HOOPS, 84 ft. in circumference, formed ribs of the Pacific Northwest's biggest concrete siphon, constructed on the Columbia Basin Project in Eastern Washington. Dry Coulee Siphon No. 1, 4,400 ft. long and 25 ft. in diameter, is being completed by Winston Bros. Co. of Los Angeles and the Utah Construction Co. of San Francisco.

Bureau of Reclamation Photo



KEEP PRESSURE UP...

KEEP COSTS DOWN



Compressor valves stay
clean when lubricated
with Texaco Alcaid, Algol
or Ursa Oil.

KEEP valves clean and you keep your compressors efficient, your operating costs low. Do this by lubricating with the Texaco Alcaid, Algol or Ursa Oils recommended for your compressors.

Texaco Alcaid, Algol and Ursa Oils have all been

especially processed to remove the impurities that form hard carbon and gummy deposits. Thus, they not only keep valves clean, but assure free rings, open ports, clear air lines — longer trouble-free, full-pressure operation between overhauls.

When handling wet air, use Texaco Regal Oils (R & O). They give the same fine lubrication, plus full protection against rust formation in coolers, air receivers and air lines . . . even during idle periods and in intermittent operation.

To assure longer drill life . . . greater footage at lower cost . . . use Texaco Rock Drill Lubricants E.P. They are designed to minimize wear, prevent rust.

Let a Texaco Lubrication Engineer explain the Texaco Simplified Lubrication Plan for construction machinery. It will save you time and money. Just call the nearest of the more than 2500 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 E. 42nd St., New York 17, N. Y.



TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

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

1948

TEXACO

HERE'S A DITCH JOB
THAT IS

TOUGH



J. S. BARRETT USING A
NORTHWEST PULLSHOVEL
AT NEWPORT BEACH,
CALIFORNIA.

LOOK at it, dry, hard, rocky going that really tests a piece of equipment. This is the kind of going where you need real power, where you need real boom and bucket design that will stand the gaff.

Talk to anyone that has used a Northwest Pullshovel and other makes of pullshovels. Ask them about the Northwest. They'll tell you it's the only pullshovel they would put into tough ditching work. Northwest dependability plus the many other Northwest advantages, is the reason why one out of every three Northwests sold is a repeat order.

Let us tell you more about the Northwest. Ask for a catalog on the size machine that you require.

NORTHWEST ENGINEERING COMPANY
135 South LaSalle Street Chicago 3, Illinois

Follow the
NORTHWEST
CROWD

Still the
Standard
toward which
others
build!

If you have a
REAL ROCK SHOVEL
you won't have to
worry about
output in dirt

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SHOVELS . . . CRANES . . . DRAGLINES . . . PULLSHOVELS

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When you apply power to any industrial job or equipment, pick FORD power... and know it's right three ways! Ford Industrial Engines are available as partial assemblies or completely builtup, ready for the job. For new engine data sheets, send postcard.

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the corner from you
... at Ford Dealers
everywhere!

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INDUSTRIAL AND MARINE ENGINE SALES DEPARTMENT

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YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED

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WESTERN CONSTRUCTION news

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER ▶

Volume 23

MARCH • 1948

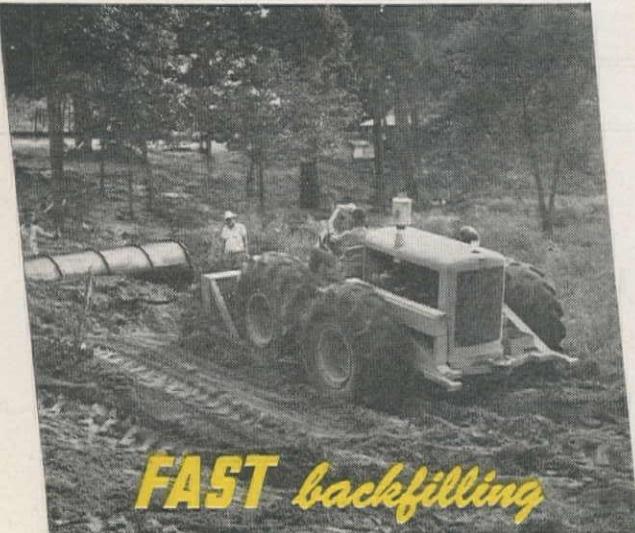
Number 3

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Covering the Western Half of the National Construction Field

FAST Rubber-tired ... speeds to 15 m.p.h.



FAST backfilling

Backfilling requires shuttle-type dirtmoving. The Tournadozer with its fast forward and reverse speeds plus instantaneous shifting cuts down non-productive dozer time — helps you move more yards per hour.



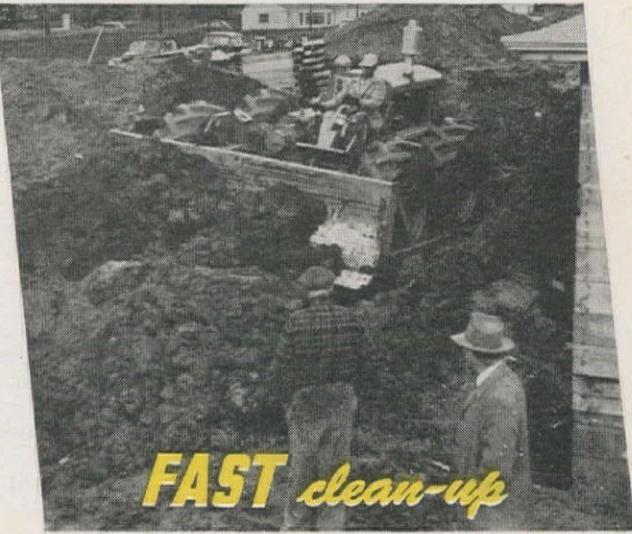
FAST push-loading

In Scraper loading, Tournadozer's pushing power plus maneuverability in high speeds, forward or reverse, means more scrapers served per pusher . . . more units loaded per hour. Result: more payloads per day, with fewer men and machines.



FAST in any weather

Special tapered bead on giant 21.00 x 25 tires prevent tire slipping on rim . . . permit lowering pressure for extra flotation and traction to meet extreme conditions in sand, mud, snow or ice.



FAST clean-up

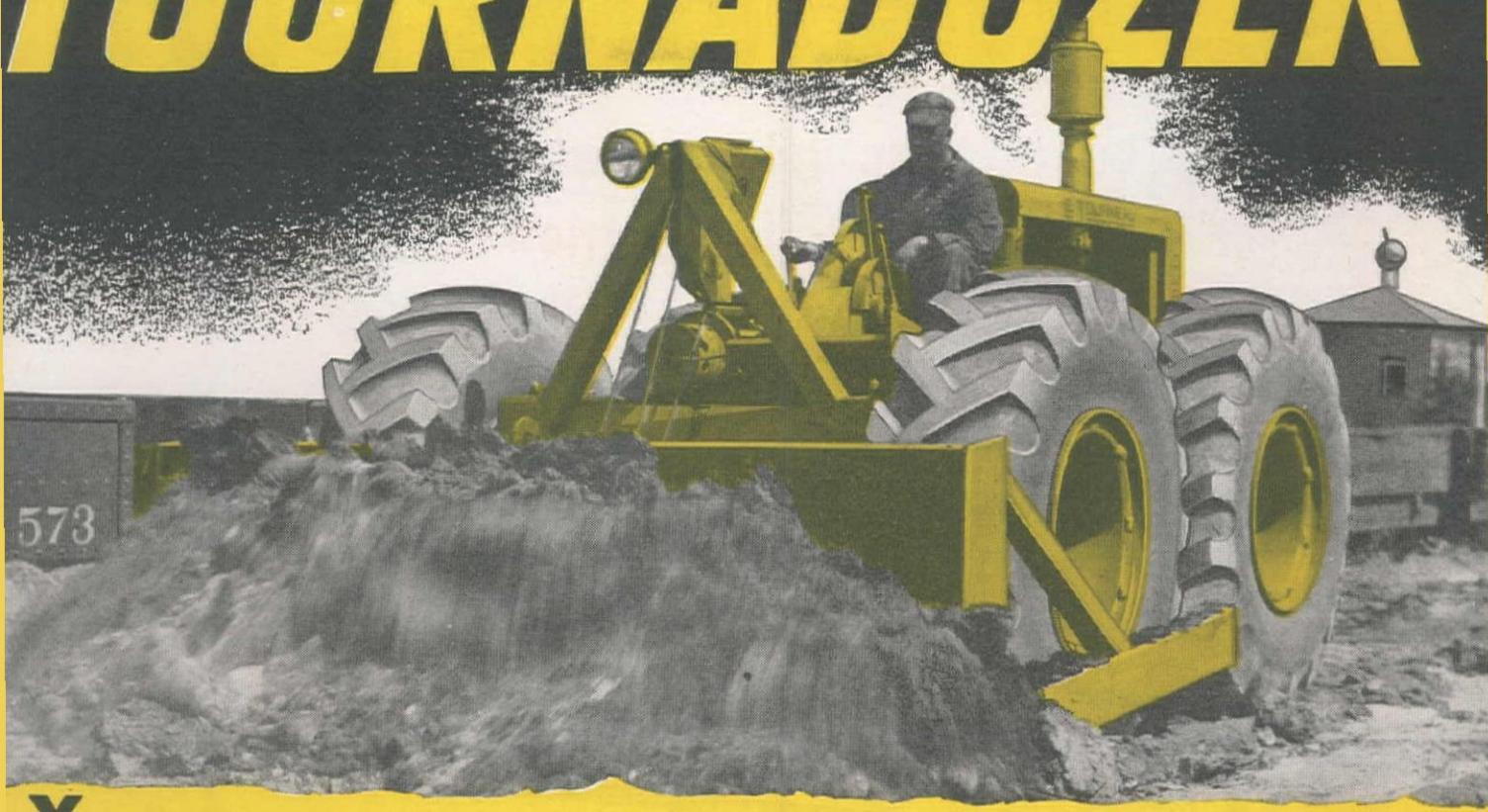
Extreme maneuverability makes this dozer ideal for contractor, mine or quarry clean-up. Easy to operate air-actuated driving and braking controls give accurate finishing . . . perfect operator visibility.

Tournadozer—Trademark RR16-B



See your **Le Tourneau Distributor**
NOW for complete information

TOURNADOZER



YES, you can now have a high-speed *rubber-tired* dozer that can go anywhere in a hurry . . . do the job faster when it gets there . . . drive fast job-to-job over pavement, black top, muddy country roads or cross country.

15 m.p.h. . . . forward and **REVERSE**

The 180 h.p. Model C Tournadozer gives you the high speed operation you've always wanted in a dozer . . . up to 15 m.p.h. in BOTH forward and reverse . . . nearly twice as fast as crawlers.

No gear-shift delay

New constant-mesh transmission in the Tournadozer gives you instant selection of gear ratios anytime . . . without loss of momentum, or stopping to shift gears. Move selector lever to speed you want and air-actuated clutches give it to you **RIGHT NOW**.

Low center of gravity and wide tire tread assure greater stability . . . short-coupled wheelbase increases maneuverability.

Giant tires give traction, extra flotation in soft going

Four big 21.00 x 25 low-pressure tires assure ample flotation and traction for toughest going . . . no track rollers to lubricate . . . no expensive moving parts to grind and wear in abrasive materials. You roll on rubber instead of steel.

Speed, power, maneuverability make it a versatile tool

This big, fast, rubber-tired dozer is ideal for road construction, maintenance, backfilling, clearing and leveling land, building dams or levees, striping, bulk material handling, and for pusher service on scraper dirtmoving.

Seeing is believing

Before you buy a slow-moving, high-maintenance dozer, see the new fast-moving, rubber-tired Model C Tournadozer in action. Your LeTourneau Distributor can give you complete information on performance, prices and delivery . . . **SEE HIM TODAY.**

LETOURNEAU
PEORIA, ILLINOIS



TOURNADOZERS

For BIG OUTPUT

...Less operator fatigue... fast all day

POWER CLUTCHES SPEED PRODUCTION

With this Koehring 605, you get big output right up to the end of the shift because power clutches, an exclusive Koehring feature, do the heavy work for the operator. In normal operation, lever pull is never more than a few pounds. This clutch also retains feel of load... keeps operator and machine working at top efficiency all day.

The 605's fast, smooth swing... cool-running clutches... and independent boom hoist make each shift more productive. Extra strength... extra stability... extra lift capacity are a few of the other reasons why this big 1½-yard 605 delivers steady, big output. It's quickly convertible from dragline to clamshell, lift crane, shovel or pull shovel, for big output and lower costs on all your jobs. Other Koehring excavator sizes: ½-yd. 205, and ¾-yd. 304.



KOEHRING
605



This big 37" power clutch cuts
normal lever pull 90%.



SEE YOUR KOEHRING DISTRIBUTOR TODAY

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KOEHRING HEAVY-DUTY DRAGLINES

CK820

JOHNSON

BIG
PAYLOAD

CLAMSHELLS

Johnson clamshell buckets are built in 3 basic types . . . Wide Rehandling . . . General Purpose . . . and Heavy Duty Digging, for big payload performance in all kinds of digging. All-welded construction minimizes dead weight . . . adds extra structural strength. Buckets are smooth inside and out . . . dig and dump with less resistance . . . operate faster. Capacities: $\frac{1}{2}$ to $2\frac{1}{2}$ yards.

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KWIK-MIX

7-SECOND
DISCHARGE

11-S DANDIE*

This big-production Kwik-Mix 11-S DANDIE gives you top-quality mix, saves time every batch. Re-mixing drum folds as it mixes . . . 85 times every minute. Exclusive Flow-line Discharge Chute reaches deep into drum, discharges full 12.1-foot batch in only 2 revolutions of drum, or approximately 7 seconds. Side or end discharge. Other Dandie sizes: 3½-S, 6-S, 16-S.

*Trademark Reg. U. S. Pat. Off.

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PARSONS

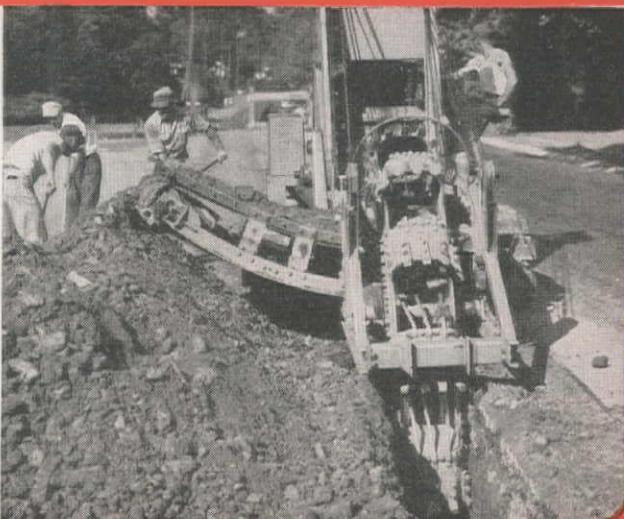
MILE-A-
DAY

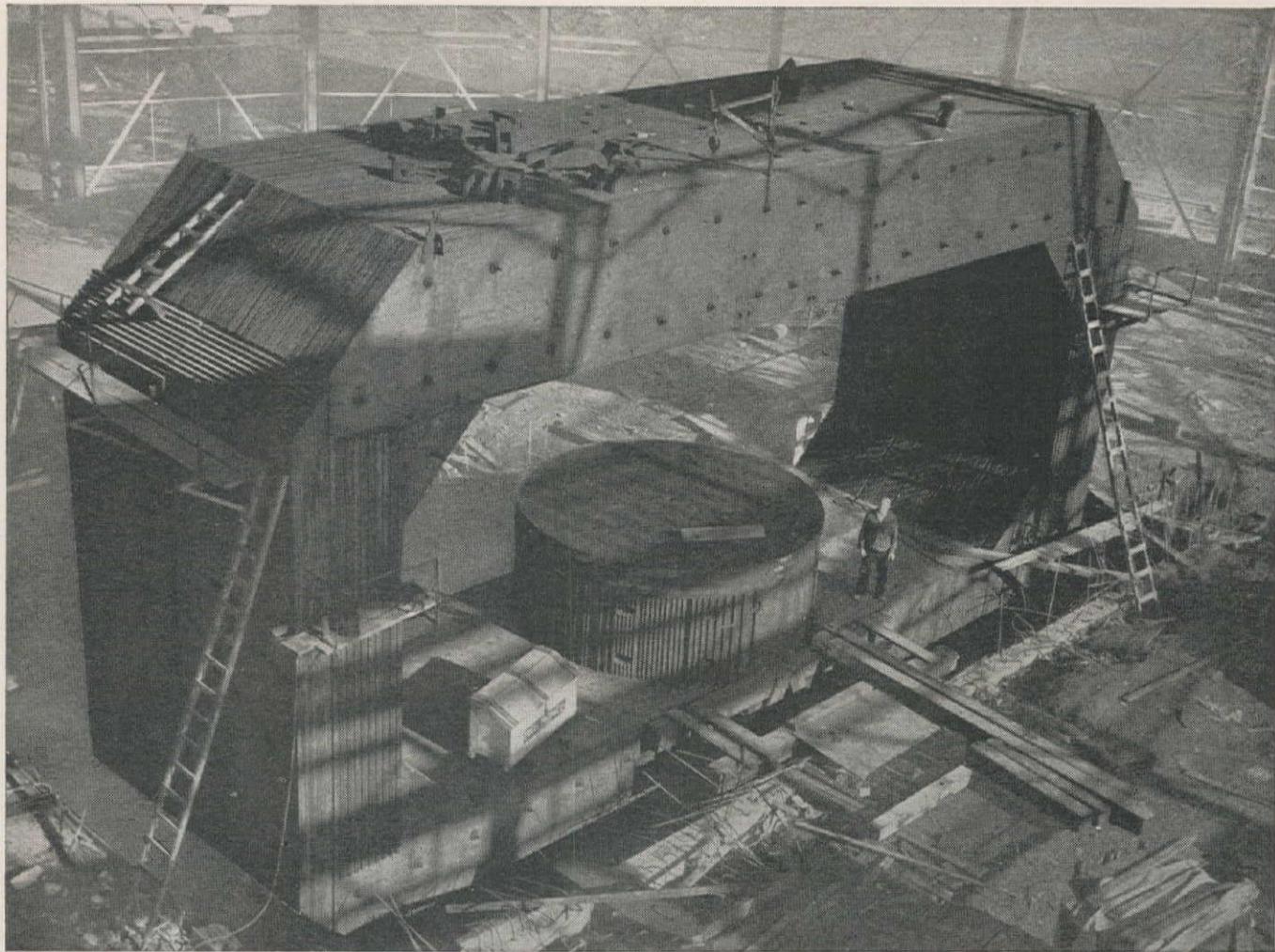
200 TRENCHLINER*

Where you want to dig every possible foot of trench per day, this Parsons 200 wheel Trenchliner is the low-cost answer. Mile a day is not uncommon. Digs up to 20' per minute . . . trenches 15" to 26" wide . . . up to 5'-6" deep. Produces clean-cut trenches ready for pipe or tile without extra, costly hand trimming. 3 other heavy-duty Trenchliners also available.

*Trademark Reg. U. S. Pat. Off.

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World's most powerful atom-smasher, the mighty cyclotron, is shown here while under construction before the war. Horizontal members of the giant electro-magnet are formed with 88 U.S.S. steel plates, 2" thick, 52' long. Each plate weighs about 14 tons. For size comparison, note the man standing to the right of the lower pole face of the magnet.

3,700 tons of tough, versatile steel used in cyclotron!

The cyclotron is a dramatic illustration of how steel can pass the stiffest tests. While such examples are rare, steel is being put to profitable use in countless construction jobs, large and small, throughout the West.

Columbia Steel is the Western producing member of United States Steel and combines its own modern steel-making facilities with the resources of others in the U.S.S. family to supply the West with everything in construction steels. Steel structural members...steel floors, rods, plates, pipe...steel siding and roofing...all are helping the West build, permanently.

For information on the various construction steels and steel products made by the great mills of United States Steel, address the Columbia Steel Company office nearest you.

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

Columbia Steel Company

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

Pacific Coast Distributors for

AMERICAN BRIDGE COMPANY • AMERICAN STEEL & WIRE COMPANY

NATIONAL TUBE COMPANY • CARNEGIE-ILLINOIS STEEL CORPORATION

TENNESSEE COAL, IRON & RAILROAD COMPANY

United States Steel Export Company, New York

Only STEEL can give you all 7 of these structural advantages

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

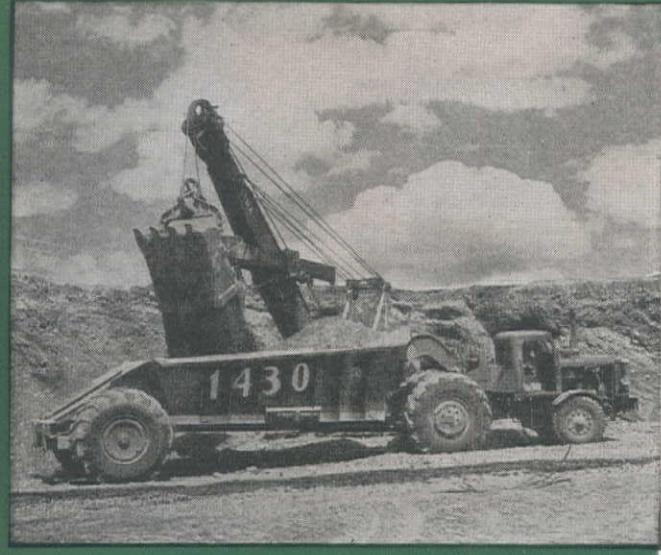


UNITED STATES STEEL

ON POTHOLE DAM...



EUCLIDS are hauling ALL the fill



Shown above is a Model LDT 25 cubic yard Bottom-Dump Euclid being loaded by a 3 1/2 yard shovel. Loading time averages 1.1 minutes. Low loading height and wide top area provide an easy target for the shovel.

● Eleven million cubic yards of rock and earth must be moved to complete Potholes Dam near Moses Lake, Washington. This huge earth-fill dam — largest single project in the Columbia Basin Development — is being built by Lytle, Amis and Green Construction Companies.

Euclids — 36 of them — are hauling all the yardage at high speed over good haul roads. With loads of approximately 13 1/3 bank cubic yards, 28 Bottom-Dumps average a 1.7 mile round trip in less than 14 minutes. Rock from the quarry for rip-rap is moved by a fleet of 8 Rear-Dumps. The "Eucs" are loaded by draglines and shovels ranging from 2 1/2 to 3 1/2 cubic yards.

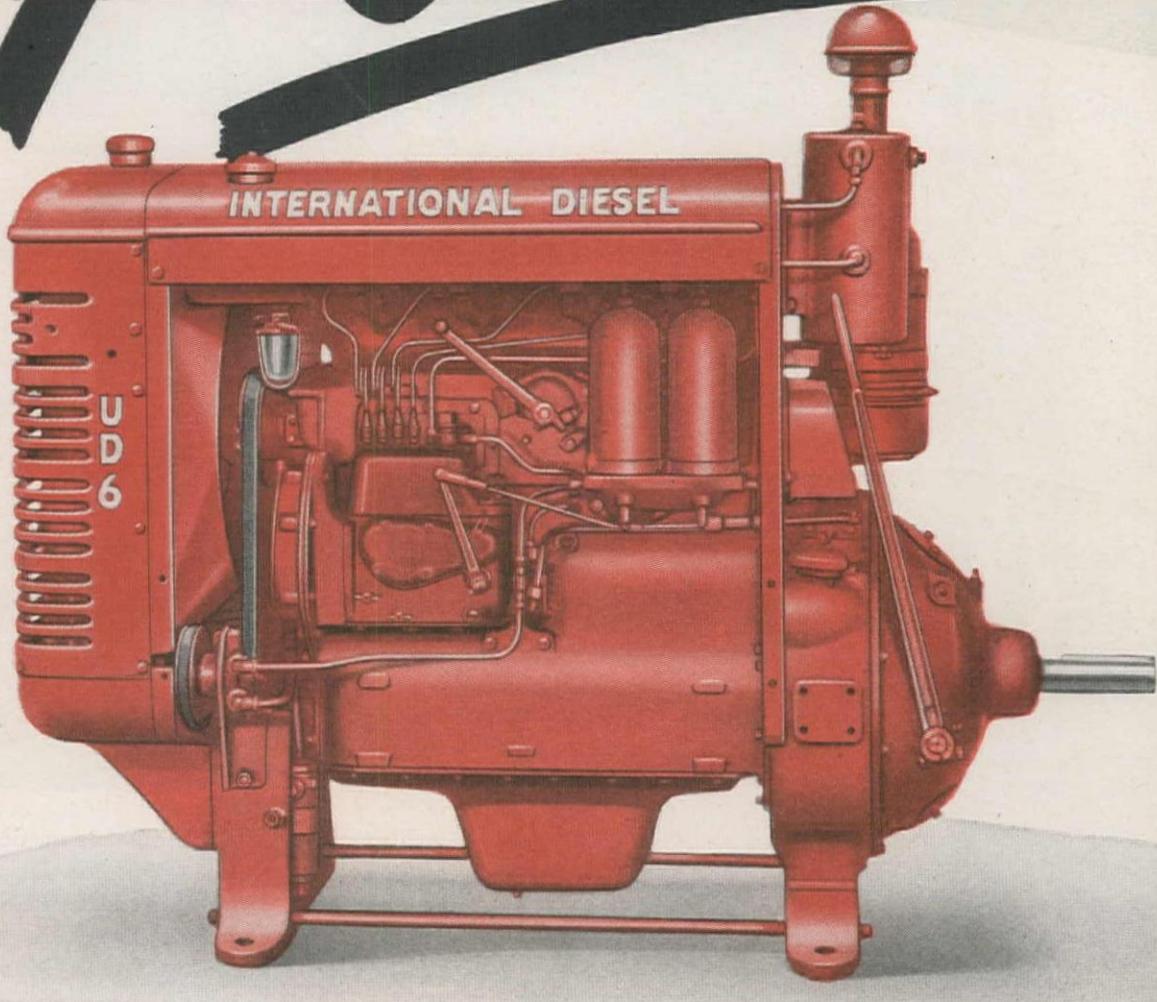
By hauling big loads at high speeds, Euclids have helped the contractors keep this job ahead of schedule. Rugged construction and dependable performance of Euclid equipment under a wide range of operating conditions hold hauling costs down. That's why it's "Eucs" all the way for hauling fill on Potholes Dam.

Your Euclid Distributor or Representative will be glad to provide complete information and the services of a hauling equipment specialist without obligation.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio



Power



39 working Horsepower

That's what the International UD-6 Diesel Power Unit, above, delivers at 1500 r.p.m. It has all the features which give Internationals superiority on any powering job! No other make of Diesel has them all. A self-contained starting system permits hand cranking or use of an optional 12-volt electric starter for easy starting regardless of weather.

The UD-6 is a smoothly operating, 4-cycle, valve-in-head engine with advanced design fuel injection; thermostatically controlled cooling; full-pressure lubrication; long-wearing, replaceable, file-hard cylinder liners; induction-hardened crankshaft; heavy-duty precision bearings; sensitive, variable-speed governor with torque control; renewable-element oil filters and a large capacity oil-bath air cleaner. Put it to work and it will give you faithful service for many years.

CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

INTERNATIONAL



TO YOUR ORDER

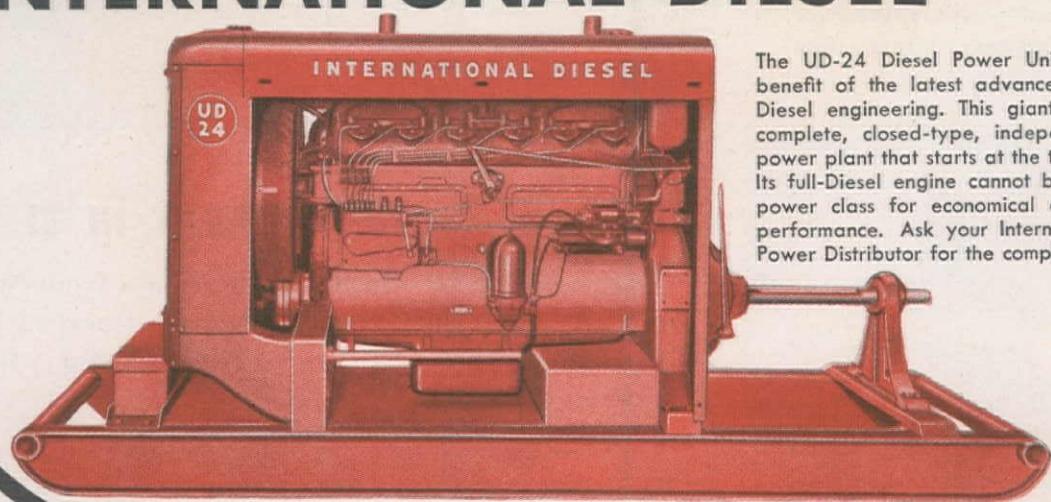


INTERNATIONAL Engines and power units are available in a range of sizes that makes delivery of *POWER to Your Order* a simple matter! Simply choose from the International line of *four* carburetor-type and *six* Diesel power units. That's the way to be sure of getting the full rated horsepower, the matchless operating economy, the dependability and long service life which Internationals deliver. The horsepower range is from 22 to 55 H.P. for carburetor models and 39 to 180 H.P. for the Diesels.

Let your International Industrial Distributor help you select the power and equipment you need. He can show you why it's *good business* to standardize on Internationals.

Industrial Power Division INTERNATIONAL HARVESTER COMPANY 180 N. Michigan Ave., Chicago 1, Ill.

The NEW 180-Horsepower INTERNATIONAL DIESEL

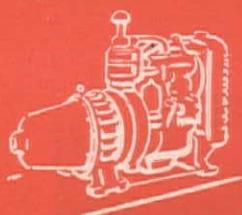


Delivers 180 H.P. at 1375 r.p.m.

The UD-24 Diesel Power Unit gives you the benefit of the latest advance in International Diesel engineering. This giant of power is a complete, closed-type, independent, portable power plant that starts at the touch of a button. Its full-Diesel engine cannot be matched in its power class for economical and dependable performance. Ask your International Industrial Power Distributor for the complete story.



Industrial Power



JAEGER-ENGINEERED for

Type "X" Diagonal Screed Finisher

"teams" with today's
mass-production pavers

Front screed is transverse, rear
screed is diagonal—pivots in either
direction to whatever angle suits
the work.



FIRST BASIC IMPROVEMENT IN 31 YEARS

Job-tested for 18 months, on highways from New York to California, the Type "X" Diagonal Screed Finisher now offers you six proved advantages for your 1948 paving work:

1. **More accurate than any transverse finisher:** Diagonal rear screed, always meeting the material at a point different from the transverse front screed, equalizes irregularities due to forms or other causes, slices off high spots, fills in the low ones.
2. **Less hand work and equipment needed behind finisher.**
3. **Finishes flush to upper form on curve elevations and pitched slab:** Angle of screed, controlled by operator, automatically carries material uphill and compacts it solidly against the top form.
4. **Eliminates or greatly reduces carry-back, saving one to two shoveler's wages.**
5. **Finishes faster without tearing, saves extra passes:** Diagonal screed works final roll of material at an angle, a real advantage when finishing stiff mixes.
6. **Capacity to match biggest pavers:** Fast and flexible, with a wide range of screed speeds all independent of traction, finisher easily keeps pace with dual drum paver output on half-width or full-width work.

Re-Mixing-Compacting Spreader Gives 2-Paver Capacity with Minimum Paving Crew

The Jaeger 1948 model Concrete Spreader, teamed with a Jaeger Diagonal Screed Finisher, will spread and smoothly finish all the yardage you can pour with as many as two 34E dual drum pavers — makes paving a precision, mass-production operation done by power machinery. Re-mixing, compacting spreader screw, exclusive with Jaeger, eliminates segregation and resulting honeycomb, positively produces a denser, more uniform pavement than other spreading methods. Wide, oscillating strike-off can be furnished for concrete work or bituminous spreading-finishing.



labor-saving mass production

Jaeger AIR PLUS Compressors help you do more work for wages paid..

Watch your production gain in yards of pavement broken, footage drilled, job progress made when you put a new AIR PLUS behind your tools. Delivers more and cooler air for every pound of fuel, maintains the steady 90 to 100 lbs. pressure that you need to keep tools working at their top efficiency and speed.

Compressors and engines are built to the same micro-precision standards. Valves are 75% to 100% larger for free air flow and "ultra lapped" to leakproof closure. Patented "Fuel Miser" control saves up to 32% of fuel. Engineered thruout to insure a dependable source of air, kept at "new machine" efficiency by service stations in 130 cities.

Sizes 60 to 600 cu. ft., trailer, truck, tractor or skid mounted.



SPEEDLINE Mixers pour it faster

You can produce bigger daily yardage with the same size crew when you put a Jaeger on the mixing job. No other outfit has the Jaeger automatic "Skip Shaker" loader, criss-cross "dual mixing" action and fast "pressure" discharge of stiff concrete. There's extra advantage, too, in Jaeger's automotive type transmission, high carbon machined steel drum tracks and oversize engines protectively enclosed. They mean lower upkeep and insurance against breakdowns that no "light-weight" mixers can provide.

3½ to 16S sizes trail on Timken bearing wheels and springs. Also plaster-mortar mixers and portable cold-patch mixers.

SURE PRIME — the only pumps with protected performance

Extra-powered, conservatively rated and sure-primed by two separate, simultaneous actions, a Jaeger is a more efficient pump to start with. Overall enclosures, exclusive with Jaeger, protect that efficiency with a dry, quick-starting, smooth running engine in all weather. Close-grained shell castings designed for high pressures, long-life Lubri-Seal, always accessible for inspection, and replaceable liners or seal rings mean extra years of low-cost service from any Jaeger pump.

Dewatering pumps from 1½" to 10", capacities to 240,000 gph; small, portable pressure pumps, diaphragm pumps, self-priming jetting pumps up to 250 lbs. pressure.

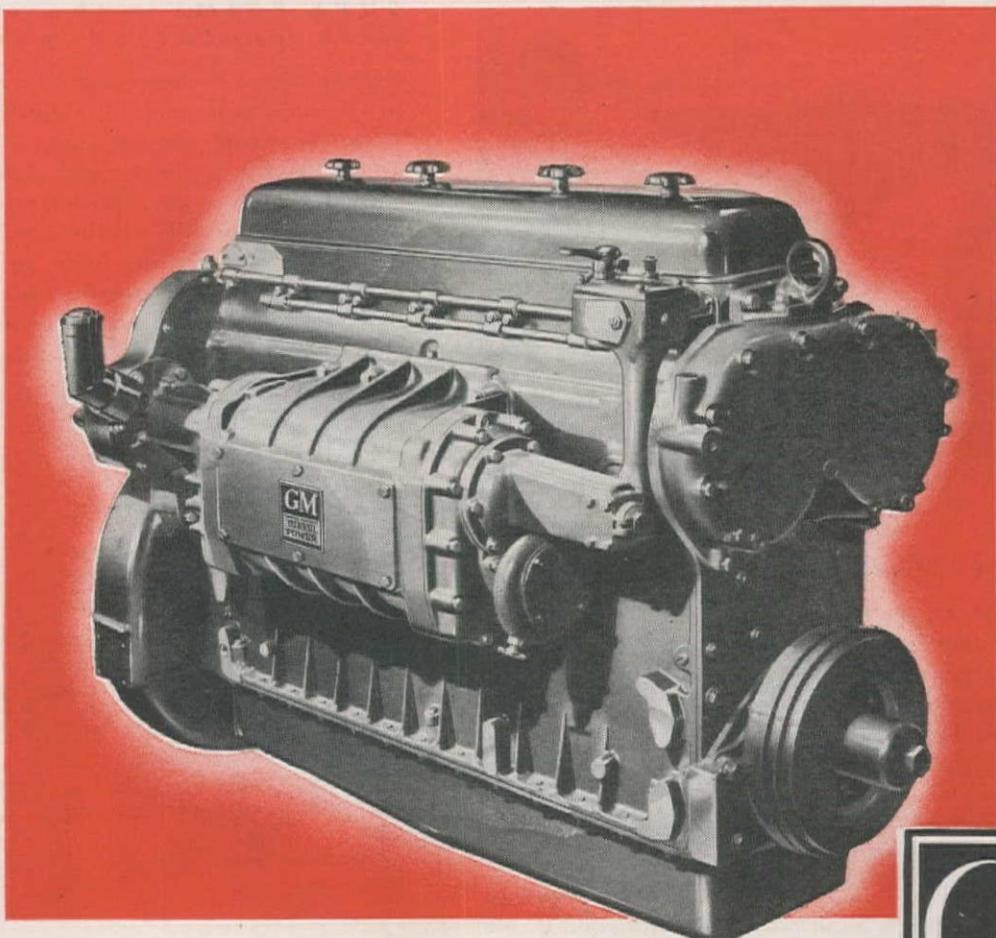


Sold, rented, serviced in 130 cities of U. S. and Canada. See your Jaeger distributor or send for latest Catalogs on above equipment, also 1948 model Bituminous Pavers, Hoists and Towers.

- EDWARD R. BACON CO. San Francisco 10, Calif.
- SMITH BOOTH USHER CO. Los Angeles 54, Calif., and Phoenix, Ariz.
- A. H. COX & CO. Seattle 4, Wash.
- NELSON EQUIPMENT CO. Portland 14, Ore., Nampa and Twin Falls, Ida.
- WESTERN MACHINERY CO. Salt Lake City 13, Utah, and Denver 2, Colo.

- ANDREWS EQUIPMENT SERVICE Spokane 9, Wash.
- CENTRAL MACHINERY CO. Great Falls, Mont.
- TRACTOR & EQUIPMENT CO. Sidney and Miles City, Mont.
- WORTHAM MACHINERY CO. Cheyenne, Wyo., and Billings, Mont.
- HARDIN & COGGINS Albuquerque, N. M.

GOOD KEEP GOOD



DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES... Up to 200 H.P.

DETROIT 28, MICHIGAN

MULTIPLE UNITS... Up to 800 H.P.

GENERAL MOTORS

GM
GENERAL MOTORS

**DIESEL
POWER**

DIESELS COMPANY

Every day more and more well-known manufacturers of contractors equipment and other machinery are offering the General Motors Series 71 2-cycle Diesel engine as power for their products.

The reason is clear. These tough, dependable Diesels provide great power in moderate space. They start easily—pick up their load fast—run smoothly and use a minimum of low cost fuel.

GM 2-cycle Diesels produce power at every piston downstroke. They are designed for easier servicing; have no high-pressure fuel lines and offer a maximum of interchangeability of parts, engine for engine.

These are the factors which, together with Detroit Diesel's owner service policy and warranty, have earned for GM Diesel its enviable reputation.

LEADING MANUFACTURERS OF THE FOLLOWING EQUIPMENT OFFER GM SERIES 71 DIESEL ENGINES IN THEIR PRODUCTS:

Air Compressors	Feed Mills	Pumps
Arc Welders	Fire Pumps	Road Rollers
Asphalt Plants	Hoists	Rock Crushers
Buses	Industrial Locomotives	Rotary Soil Tillers
Cableways	Locomotive Cranes	Saw Mills
Cranes	Logging Loaders	Screening Plants
Distillation Equipment	Logging Yarders	Shovels
Ditchers	Mining Pumps	Soil Stabilizers
Draglines	Motor Graders	Stave Mills
Dredges	Off-The-Road Vehicles	Tractors
Earthmoving Loaders	Oil Field Equipment	Trucks
Evaporation Units	Pavers	Wellpoint Pumps
	Power Scrapers	

IT'S WISE FOR YOU TO SPECIFY GM DIESEL



...by men who know costs

Predominance of Cummins Diesel Engines in the diesel fleets of the country's leading contractors is another strong endorsement of the performance of Cummins Diesels.

Such cost-conscious operators estimate the worth of an engine by its ability to stand up under the demands of the most rugged jobs . . . to operate with minimum downtime and maximum wear-life. They demand a diesel engine built to the highest manufacturing standards . . . a premium engine for premium jobs.

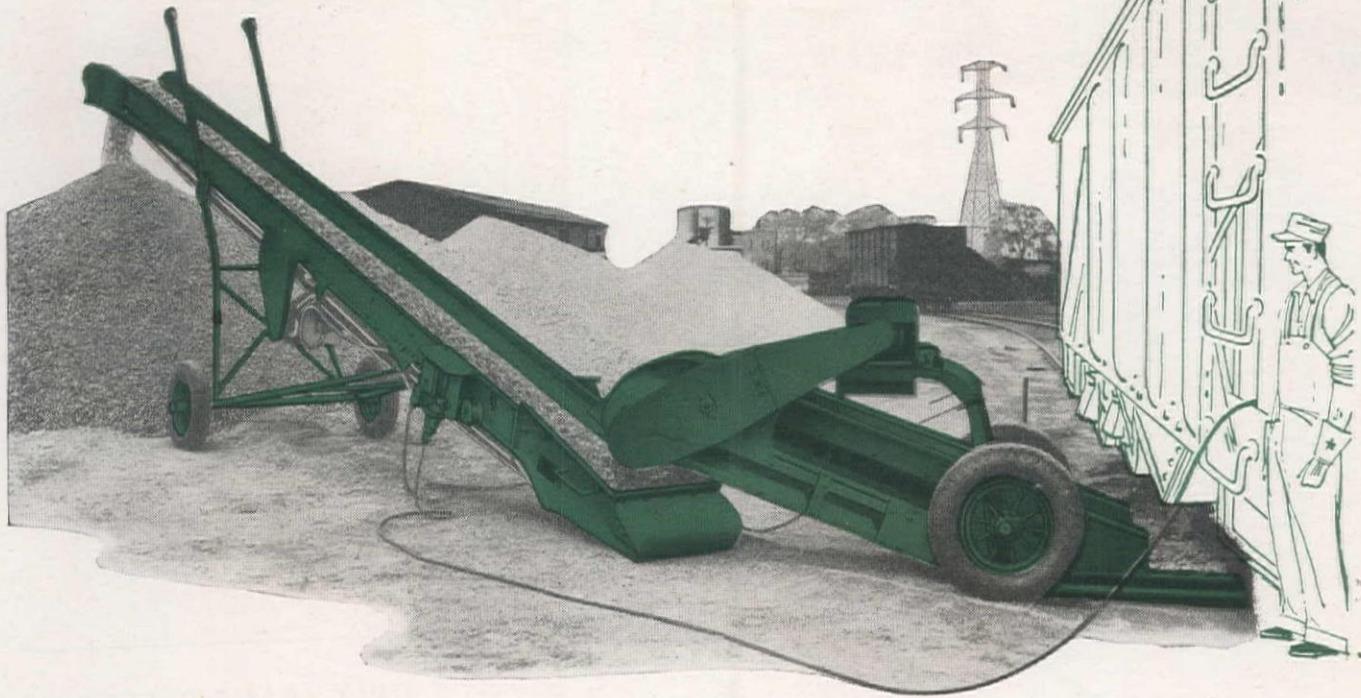
Ask your Cummins dealer for on-the-job evidence of the dependable, economical performance of Cummins Diesels in the equipment of leading contractors in your vicinity.

CUMMINS ENGINE COMPANY, INC. . COLUMBUS, INDIANA

Barber-Greene

Sensational

NEW CAR UNLOADING TEAM!



**unloads car of rock or crushed stone
in 45 minutes**

358

B-G HOPPER CAR UNLOADER

Here's a rugged all-material unloader that's completely new in design. The 358 cuts hopper car unloading time as much as 90%—unloads most any bulk product from fine sandy material to large-sized rock aggregates at capacities up to 3 tons per minute—empties a 60-ton car in as little as 45 minutes without jam-ups or delays. There's positive material flow at all times. Easily "spotted" in track pit or above rails—really portable—can be towed at normal traffic speeds.

363

B-G PORTABLE CONVEYOR

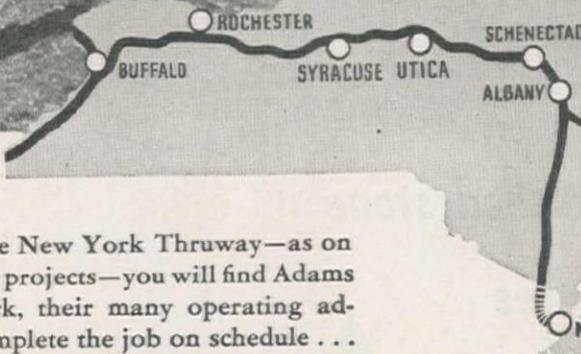
The newly designed B-G Model 363 Portable Conveyor is an extremely flexible machine that will prove to be profitable to yards, industrial plants, contractors, etc. Speeds up stockpiling or transfer of material from car or stock pile to trucks. Entirely new in design, the 363 features V belt drives, pneumatic tires, shock absorbers, towing hitch, and a host of new improvements. Send for new attractive literature on these two great B-G machines.



BARBER - GREENE COMPANY - AURORA, ILLINOIS

FOR SALE BY: Brown-Bevis Equipment Co., Los Angeles 11, California; Columbia Equipment Co., Spokane, Washington, Seattle, Washington, Boise, Idaho, Portland 14, Oregon; Wilson Equipment & Supply Co., Cheyenne, Wyoming, Casper, Wyoming; Contractors Equip. & Supply Co., Albuquerque, New Mexico; Ray Corson Machinery Co., Denver 9, Colorado; Jenison Machy. Co., San Francisco 7, California; Western Construction Equipment Co., Billings, Montana, Missoula, Montana; Kimball Equipment Co., Salt Lake City 10, Utah; State Tractor & Equipment Co., Phoenix, Arizona.

Adams advantages at work on great New York Thruway—



ON THE GREAT 485-mile New York Thruway—as on many big road-building projects—you will find Adams Motor Graders at work, their many operating advantages helping to complete the job on schedule... to exacting specifications—at minimum cost.

For example, Adams *Precision Mechanical Controls* provide fast, accurate blade and scarifier adjustments. *Balanced Weight Distribution* assures always-ample blade and scarifier pressures—even in hard materials. And Adams *8 Overlapping Forward Speeds* always provide exactly the right travel speed for performing each operation at the fastest practical rate.

These, and many other advantages, make Adams Motor Graders *Your Best Buy—All Ways*. Ask your local dealer for information.

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

ONLY ADAMS OFFERS ALL THESE OUTSTANDING ADVANTAGES

- 8 Overlapping Forward Speeds
- High-Arch Front Axle for Clearance
- Push-Button Starting from Cab
- Positive Mechanical Controls
- Wide Range of Blade Adjustments
- Exceptional Blade Clearance in All Operating Positions
- Balanced Weight Distribution
- Easy Access for Fast Servicing
- World-Wide Dealer Service

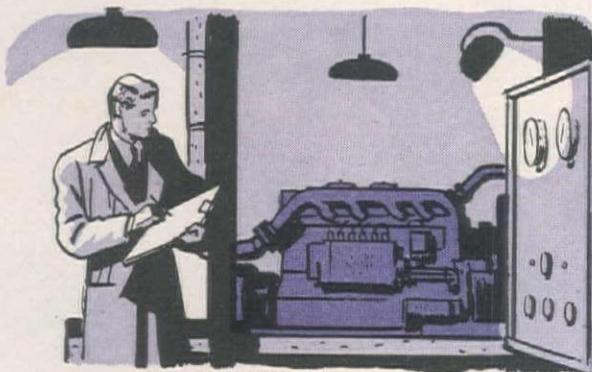
**LOCAL
Adams
DEALERS**

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

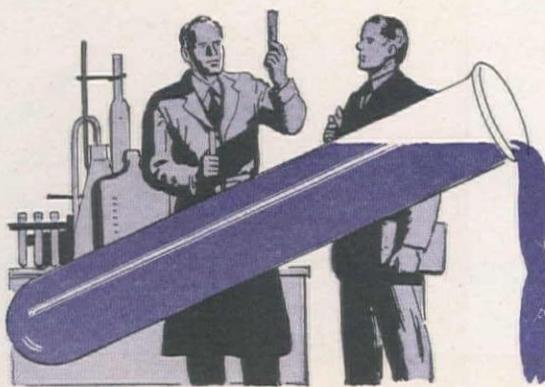
T5X

THE NEW PURPLE OIL

**Gives Greater Protection for
ANY Internal Combustion Engine!**



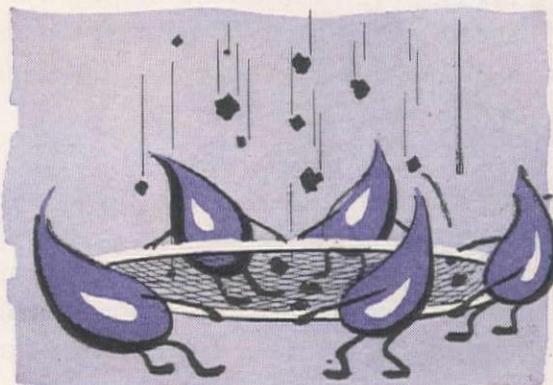
2. T5X proved its outstanding quality by easily passing the grueling 500-hour continuous-run Diesel engine tests.* In the "L-4" Coordinating Research Council gasoline engine tests, T5X proved to be so stable that it lasted *double* the length of time required for top lubricating performance!



4. T5X reduces wear to an absolute minimum! It contains a special inhibitor which greatly retards oil oxidation and gives T5X high stability against heat. Another additive protects against corrosion and rust. A third ingredient retards foaming even under the most severe operating conditions.



1. T5X—the sensational new purple oil—gives outstanding protection and performance in *any* kind of internal combustion engine in *any* industrial operation! T5X is a fully compounded, detergent type oil. Its distinctive color comes from an exclusive ingredient that helps give the oil its remarkable stability.



3. T5X keeps your engines clean longer! It contains an exclusive new detergent compound that prevents sludge formation to a degree never before attained—by holding impurities harmlessly suspended in the oil! Thus oil lines, pistons and ring grooves stay clean far longer!

For full information on this sensational new purple oil phone your local Union Oil Representative or wire Sales Department, Union Oil Company, Los Angeles 14, California.

**UNION OIL
COMPANY**



OF CALIFORNIA

* Tests conducted 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.

WHY THE

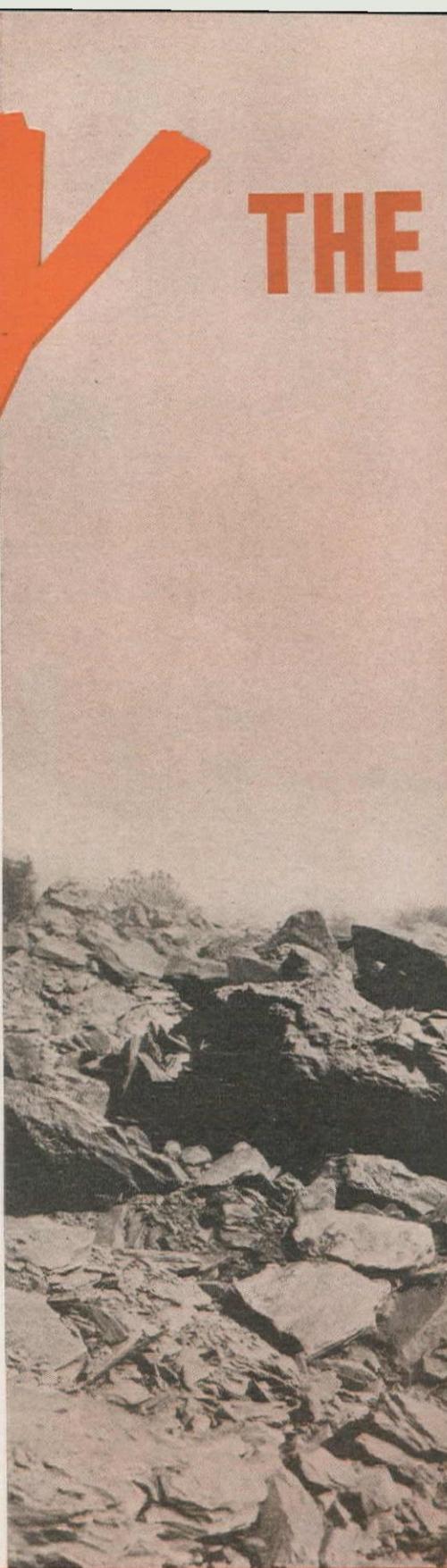
BECAUSE ... it has a hydraulic torque converter... a simple unit which automatically balances the power of the engine against its load. Enables the tractor to put in motion any load that can be moved — (available torque for starting a load is $3\frac{1}{2}$ to 4 times that required for normal travel speed with load). Tractor automatically picks up speed as load is moved — not limited to gear at which load can be started.

BECAUSE ... torque converter keeps tractor working at higher average speeds — takes away most of the gear shifting — automatically and constantly keeps tractor at a speed which utilizes full engine horsepower, regardless of load.

BECAUSE ... operation is continuously smooth. Master clutch engages under no load — no jerking, no sudden shock to tractor or operator. Full pulling or pushing power is achieved instantly with velvet-like smoothness. This means fewer repairs . . . longer life of tractor and auxiliary equipment.

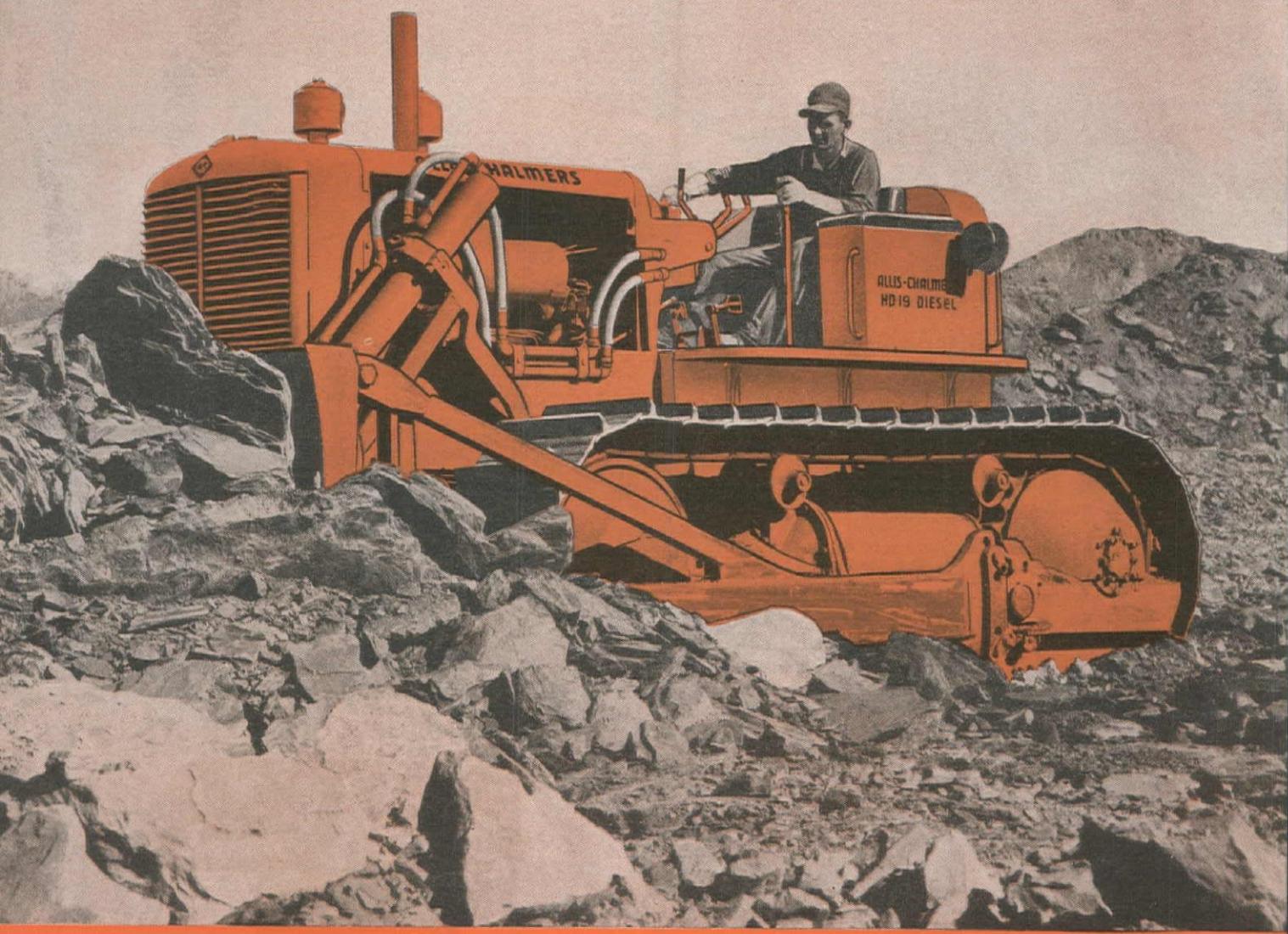
Result is more work done — day in and day out — more dirt on the fill at lower cost per yard.

**THE HD-19 OUTPULLS, OUTPERFORMS
ANY TRACTOR EVER BUILT!**



ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.
Originator of the Torque Converter Tractor

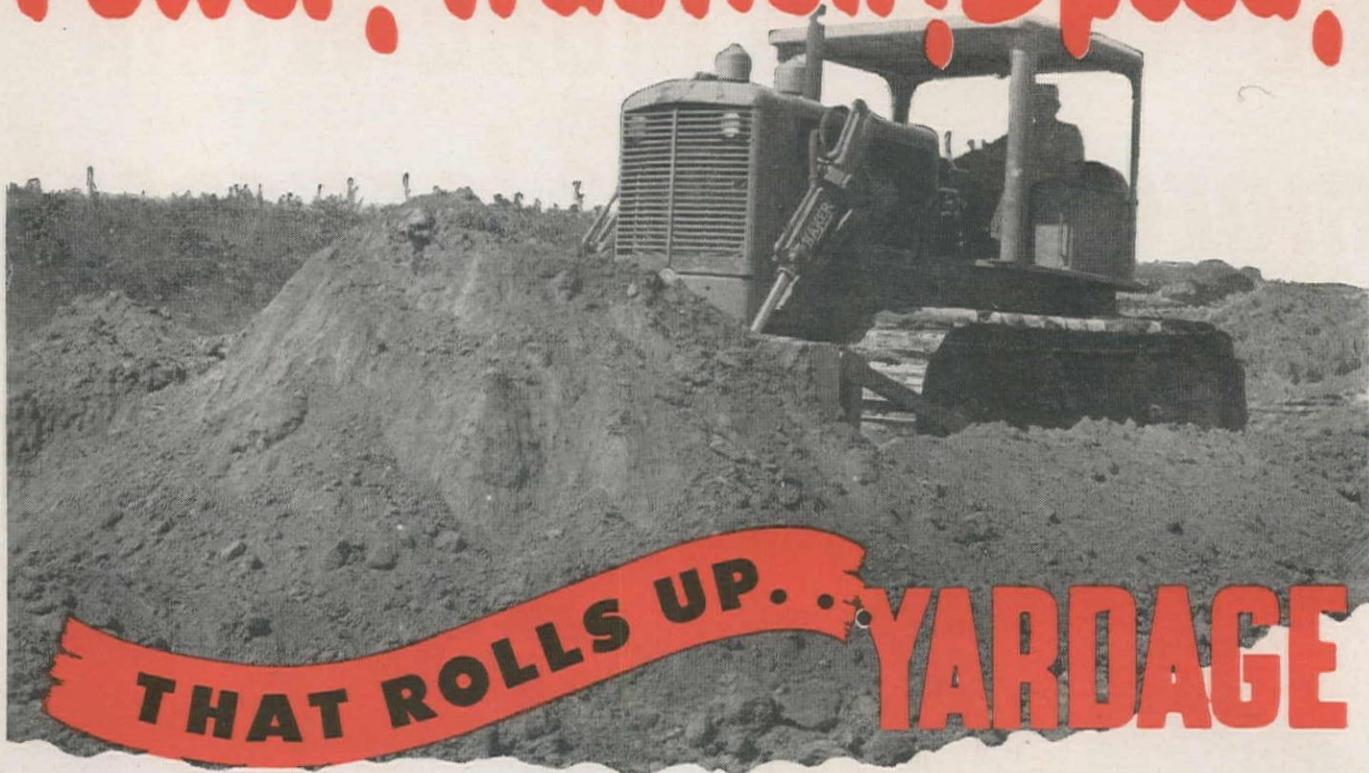
HD-19 DOES MORE WORK *more easily, at less cost!*



ALLIS-CHALMERS HD-19, A 40,000 POUND TRACTOR with HYDRAULIC TORQUE CONVERTER DRIVE giving an infinite number of speeds in only TWO RANGES — 0 to 3 in low gear and 0 to 7 in high; reverse, 0 to 5.5.

**IT'S RUGGED AND TOUGH
BUILT TO OUTPRODUCE AND OUTLAST**

Power! Traction! Speed!



The new Allis-Chalmers HD-19 and Baker Bulldozer are setting remarkable records for low cost yardage on the toughest jobs in the nation. With over 24 tons of fighting weight, this powerful bulldozing team provides speed, power and traction never before available.

ABOVE: Engine Mounted Hydraulic Bulldozer for HD-19
BELOW: Engine Mounted Cable Bulldozer for HD-19

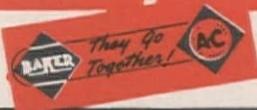


Baker Bulldozers and Gradebuilders were designed from the blueprint stage up, to harness the terrific power of the HD-19. As a result you get every ounce of power at the blade — positive all weather traction for tough going — blade operating speeds that conform to travel speeds — fast, easy operating controls — good visibility, and a complete package of power, versatility and operating economy.

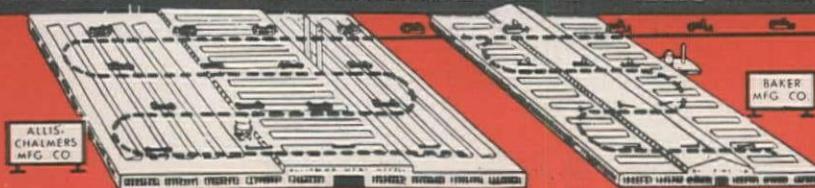
Before you start your next job — get started right. Send for literature today on the Baker Cable or Hydraulic Bulldozer and Gradebuilder.

BAKER MFG. CO., SPRINGFIELD, ILL.

BAKER



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



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops, adjoins the Allis-Chalmers crawler tractor plant.

When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.

...AND THE CHOICE WAS 100% BLUE BRUTES!

Two Blue Brute Portable Compressors powering four Blue Brute UMW-40 Wagon Drills, breaking ground for the Franklin D. Roosevelt Veterans' Hospital near Peekskill, N. Y. Part of the All-Blue-Brute equipment used for rock excavation by the Mt. Vernon Contracting Corporation of Mt. Vernon, N. Y., sub-contracting for Merritt, Chapman & Scott of New York City and Fred J. Brotherton of Hackensack, N. J.



When a big-time contractor goes all-out for one make of equipment, it's time to sit up and take notice! That's what happened last summer, when the Mt. Vernon Contracting Corporation was awarded the sub-contract of excavating, grading and remodeling the 383-acre site of the huge, \$22,400,000 Franklin D. Roosevelt Veterans' Hospital at Cruger's Park, N. Y.

For rock excavation, the Mt. Vernon Corporation selected Worthington Blue Brutes—100%—nine 500' and two 315' Blue Brute Portable Compressors, fourteen Blue Brute Wagon Drills and eighteen Blue Brute Hand-Held Rock Drills. Equipment-

wise from long experience, Mt. Vernon executives knew they could count on Blue Brutes for top performance *all* day—every day—under the toughest going.

On your own jobs, hook up a Blue Brute Compressor with Blue Brute Air Tools and watch a hard-hitting combination start things moving—fast! You'll get new ideas about speed, efficiency and economy—and about the Blue Brute teamwork that gives you a comfortable feeling on every bid.

Your nearby Blue Brute Distributor is ready with complete details about features, capacities, performances, etc. Or write to us direct.

Buy BLUE BRUTES

HB-7

KNOW YOUR

BLUE BRUTES

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

RANSOME EQUIPMENT

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

WORTHINGTON EQUIPMENT

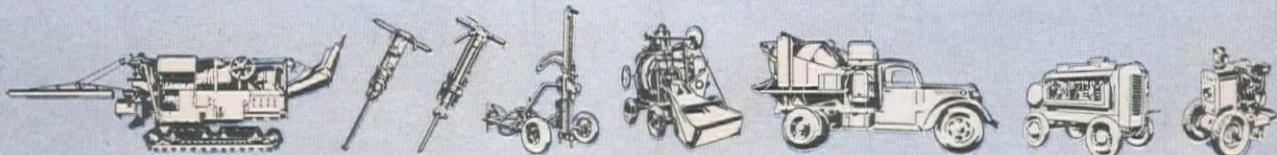
Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Self-Priming Centrifugal Pumps and Accessories.

WORTHINGTON

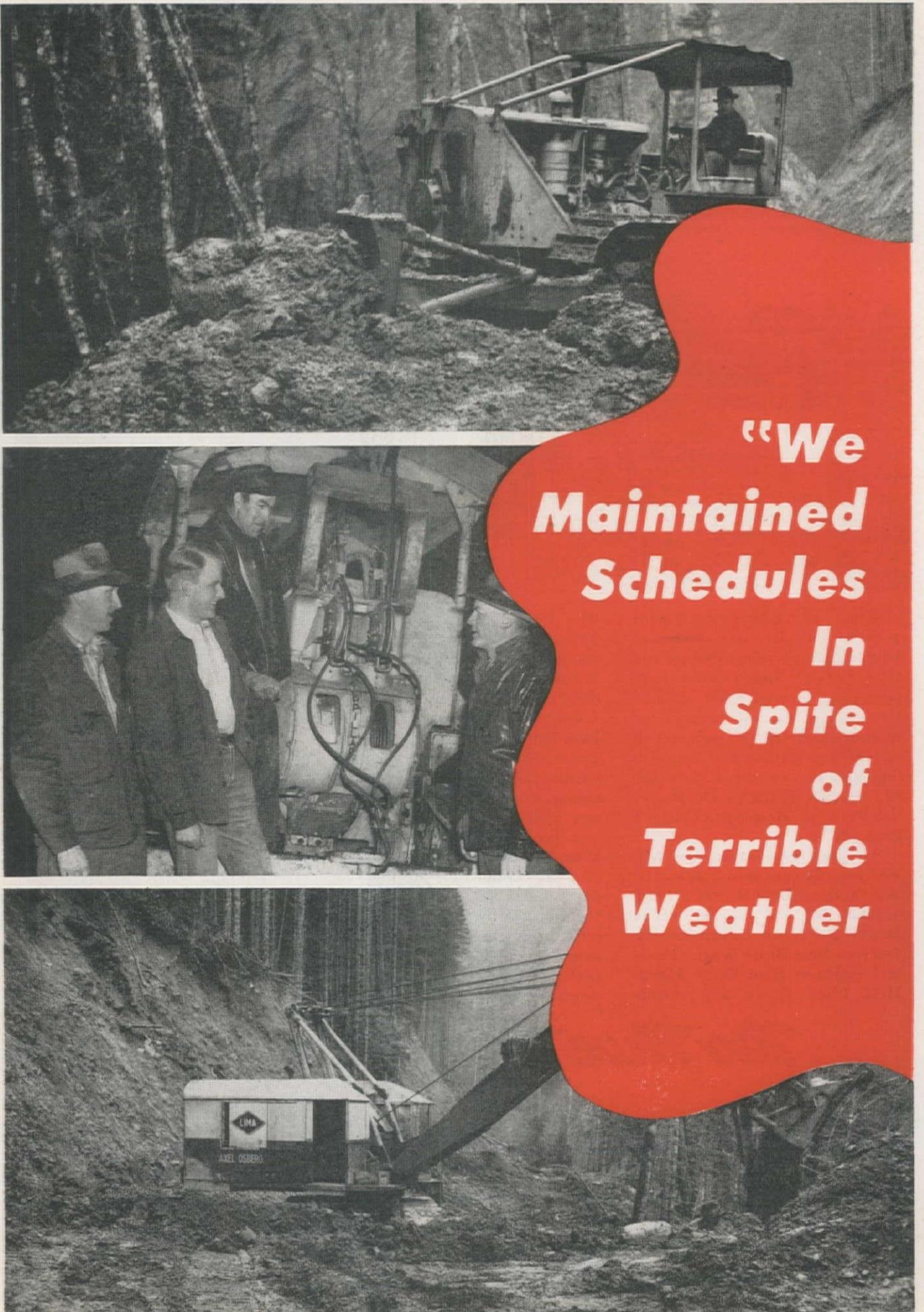


Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division, Holyoke, Mass.

Distributors in all principal cities



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



**"We
Maintained
Schedules
In
Spite
of
Terrible
Weather**

with the help of **G. P.** **Lube** **Engineering** **Service”**



GENERAL
PETROLEUM
CORPORATION

(A Socony-Vacuum Company)

A Progressive Member of a Progressive Industry

Osberg Construction Company, specialists in road building, tackled a tough one in this job near Packwood, Washington. The contract is for ten miles of timber access road at an elevation of 4,500 feet in Mt. Rainier National Forest. The work started in May, 1947 and has been handicapped by almost continual rain and mud.

Even before track-type shovels could be used it was necessary to lay 8 x 8 ties.

In spite of such difficulties, schedules have been maintained, and much of the credit is given to G. P. Contractors' Lube Service, by Superintendent Allen Osberg.

With due allowance for seasonal conditions, recommended schedules have been carefully followed, and there have been no major equipment breakdowns.

Osberg has used General Petroleum products for ten years. On this job G. P. is delivering fuel and lubricants for five bulldozers, three shovels, a patrol grader, carryalls and trucks.

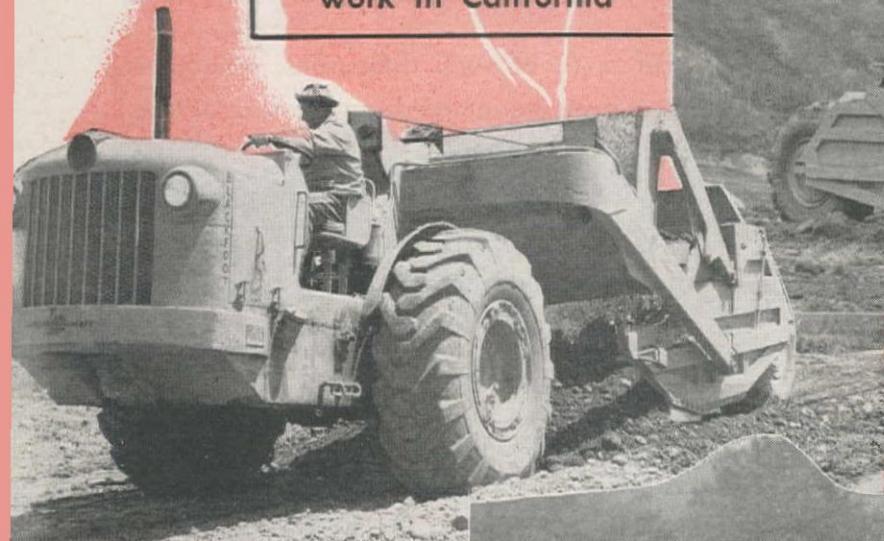
To Help You...
G. P. LUBE
ENGINEERING SERVICE

Includes:

1. EQUIPMENT SURVEY—To analyze equipment and operating conditions for proper recommendations.
2. SERVICE SCHEDULES—Set up schedules for lubrication at proper intervals.
3. PRODUCT RECOMMENDATIONS—To insure use of correct lubricants at specified periods.
4. INVENTORY CONTROL—Selection of the minimum number of products necessary.
5. STORAGE—Recommendations for necessary storage facilities and handling equipment.
6. DELIVERIES—To set up schedules for the delivery of all necessary products to insure uninterrupted operation.

All over the country... on all **LA PLANT-CHOATE**

Highway Relocation
work in California



Road Building
in Idaho



Stripping in
Pennsylvania

Formally introduced to the trade a few months ago, these high-speed earthmovers have already established a reputation for making more money . . . for easy operation and most important — for staying on the job with a minimum of down time.

From coast-to-coast . . . in Great Britain . . . Sweden . . . South Africa — LaPlant-Coate Motor-Scrapers are at work on an ever-increasing variety of jobs!

Sixteen horsepower per struck yard of capacity provides more power for loading . . . for hauling . . . for ejecting . . . any material under any operating condition. Safe, positive, hydraulic steering thru double acting jacks. 60° turns each way.

For complete details and operating data, see your nearest LPC distributor. LaPlant-Coate Manufacturing Co., Inc., Cedar Rapids, Iowa; 1022 77th Avenue, Oakland, California.

LA PLANT CHOATE

HIGH SPEED EARTHMOVING EQUIPMENT

FOR LOWEST POSSIBLE COST
PER YARD..PER JOB..PER YEAR

kinds of jobs...the trend is to **MOTOR-SCRAPERS!**

Subdivision work
in Ohio



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in Michigan

ENGINEERING SALES SERVICE, INC.

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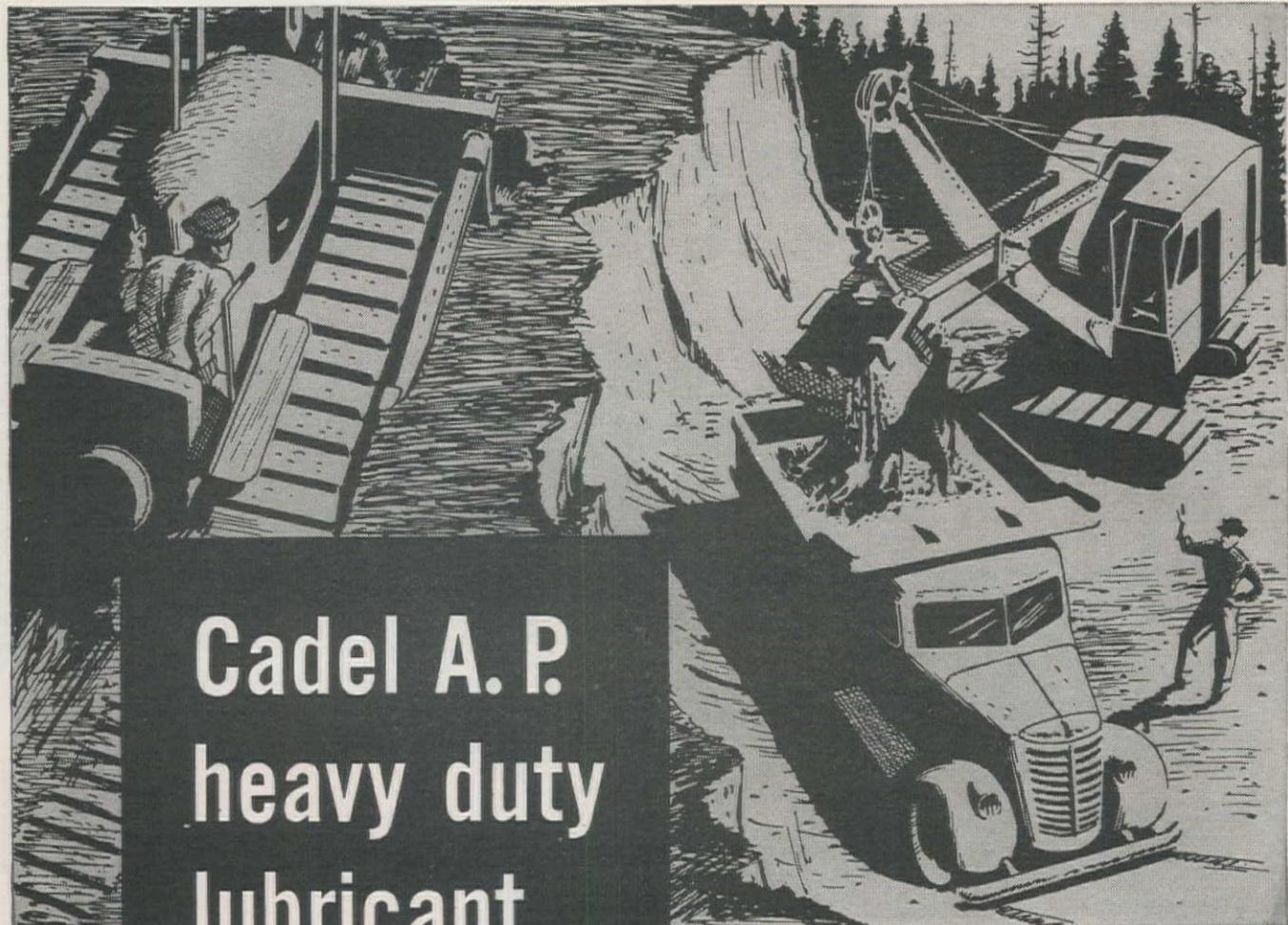
WESTERN CONSTRUCTION EQUIPMENT CO.

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Cadel A.P. heavy duty lubricant



is the only motor oil you need

For both diesel and gasoline engines in your trucks, tractors and other equipment, Cadel A.P. (All-Purpose) Heavy Duty Lubricant gives you finest protective lubrication and *clean*, efficient operation. Available in SAE grades from 10 to 50, Cadel will simplify your purchasing and storage, and make errors impossible.

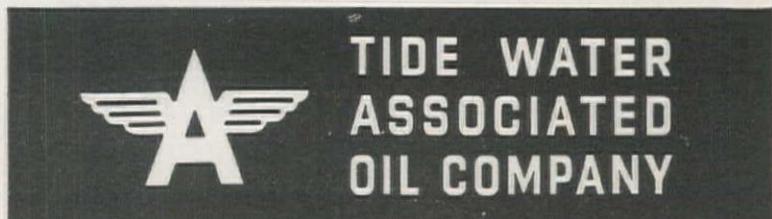
Cadel is made from a top-quality, spe-

cially treated base oil, which is combined with a superior triple-action additive that prevents oxidation, bearing corrosion and engine deposits. Oil lines, valves and rings are kept clean and free, and pistons and cylinder walls are mirror-bright. Repair bills and overhauls are fewer when Cadel is used exclusively, and operation is more efficient. A trial will convince you.



Call your Associated Representative for expert help on any lubrication problem

Tell Your Associated Dealer You Want a National Credit Card



**LOOK
before you
LEAP**

**Don't sell your "Caterpillar"
equipment until you are
SURE you can replace it**

IN this day of "sellers' markets" there are, no doubt, many who would like to buy some of your "Caterpillar" equipment—at an attractive figure.

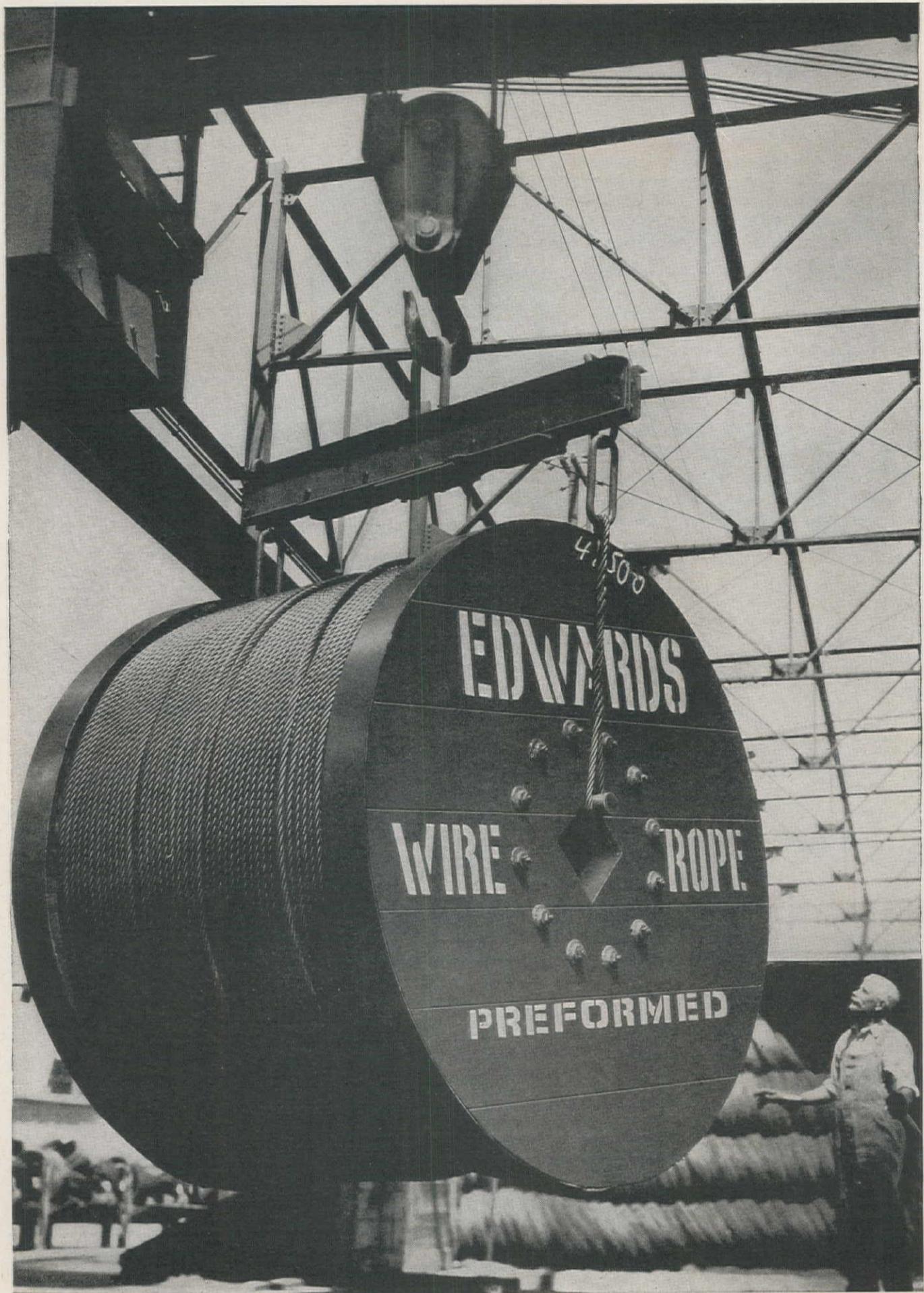
But where would that leave *you*? Be sure you *know* before you sell.

Though factory production and shipments from coast to coast are greater than ever, the supply of most "Caterpillar" products is still many months behind demand.

Look at it this way: If your "Caterpillar" equipment is easy to sell, it must be profitable to keep. "Caterpillar" products, with their inherent high quality, are seldom so old or worn that they can't be given many additional hours of good service by overhauling or parts replacement. Your "Caterpillar" dealer can give you a mighty efficient job—at reasonable cost.

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

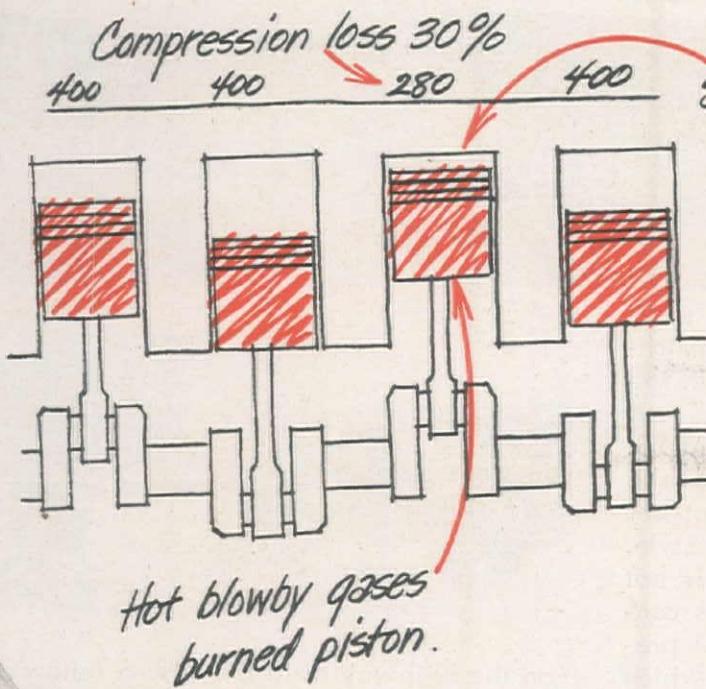
CATERPILLAR DIESEL
REG. U. S. PAT. OFF.
**ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT**



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

LUBE MEMO

Engine overheating caused
by stuck rings



Shop found rings in
#2 badly stuck by
ordinary oil (blowby
has been wasting power).

Foreman claims RPM
DELO Diesel Engine
Lubricating Oil's
compounds will prevent
stuck rings 3 ways:

1. Decrease carbon
2. Stop formation of gum.
3. Hold contaminants
in suspension (they're
flushed out on oil change).

Give shop go ahead
on RPM DELO Oil



STANDARD OF CALIFORNIA



"I Chose Trailmobile For Its Maneuverability" Says John R. Winter



John R. Winter, the driver they will all be watching in the 1948 A.T.A. ROADEO, turned in the second highest score in the National Truck Roadeo at Los Angeles on October 27 and 28. For this great test of driving knowledge and skill, Winter also chose TRAILMOBILE and put her through the paces in true championship style. Knowing that the choice of equipment is not pure accident where keen competition is concerned, we asked John R. Winter to tell us precisely why he chose a TRAILMOBILE with which to demonstrate his driving skill, and here is what he said: "I chose TRAILMOBILE because of its maneuverability. In my fourteen years of accident-free driving, I've always held a warm spot in my heart for TRAILMOBILE. It is, without a doubt in my mind, the easiest pulling and nicest handling trailer on the highway today. The old saying goes here, 'Give a Man Good Tools, and he'll do a good job'. So, with a TRAILMOBILE,



on the highway or in the city—a fellow doesn't have to be a champion to do a good job." Everyone who saw his driving will regard the above remarks as EXPERT TESTIMONY. There is just no doubt about it—if you want to shoot like a champion, you've got to use a good gun. If you want to be a winning driver, you'll choose equipment that handles well. In 1947 the winners proved two to one, just what can be done with a TRAILMOBILE.

THE TRAILMOBILE COMPANY
BERKELEY, CALIFORNIA

TRAILMOBILE

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SOUTH MILWAUKEE • WISCONSIN

BU^YCRUS ERIE

Dragshovel efficiency is only one of the features which have made the Bucyrus-Erie 10-B, 15-B and 22-B excavators world famous. With any front end equipment they are fast, profitable performers. Erie distributor for more information.

The 10-B dipper is all-welded, shaped that permits easy filling without voids. Hold extra material, it has a high arch which means the relatively long side cutters to grip that penetrates easily and supplies efficiency. With a long extended dipper

The dragshovel dipper, too, adds to work and boosts output. Erie's efficiency is only one of the features which have made the Bucyrus-Erie 10-B, 15-B and 22-B excavators world famous. With any front end equipment they are fast, profitable performers. Erie distributor for more information.

DRAGSHOVELS HARD-BITING WITH



CLEVELAND, OHIO

At the Division

EATON MANUFACTURING COMPANY

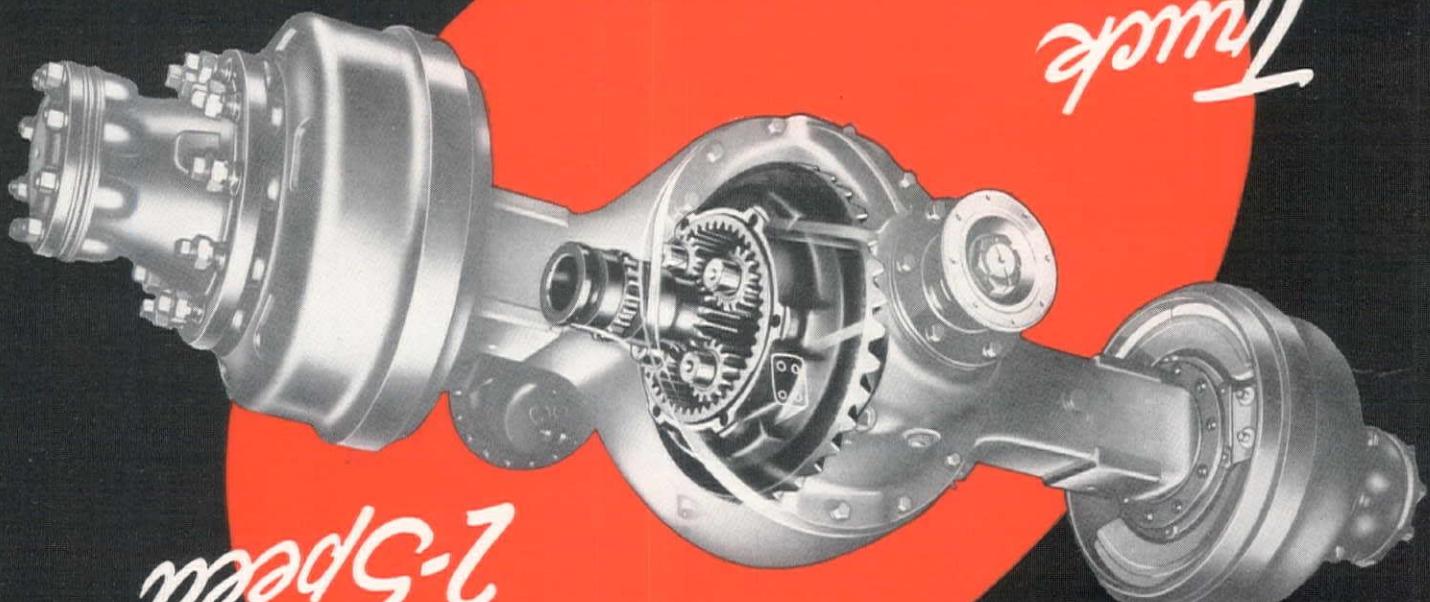
MORE THAN 3/4 OF A MILLION EATON 2-SPEED AXLES IN TRUCKS TODAY

The planetary construction in Eaton 2-Speed Truck Axles provides a number of basic advantages which contribute to efficient, trouble-free operation and long life for axle and vehicle. In the low-speed power range, smooth loads are distributed over four "planet" gears; stress and wear on the teeth are held to a minimum. Slow gear movement makes for easy shifting and silent operation. Outstanding performance records are proof of Eaton quality and design. See your truck dealer for complete information about Eaton 2-Speed Truck Axles.

longer life

AXLES

Truck



2-Speed

EATON

Planetary Construction Gives

YOU *Save* BY STANDARDIZING

on Airco Nos. 87, 90 and 230 Electrodes

(A.W.S. Class. E6011-12-13)

Here are three A.C.-D.C. electrodes that meet approximately 61% of all general-purpose, mild steel welding requirements — on production lines, or special jobs.

Airco No. 87, 90 and 230 produce weld metals of high mechanical properties. Their excellent slag coverage results in an unusually smooth deposit, with easy slag removal. Airco No. 230, for example, has a specially formulated coating that produces a spraying type of arc. This is of great assistance in the performance of vertical and overhead welding, permitting high welding speeds with excellent deposits.

All three electrodes are recommended for normal or high speed welding in the flat, vertical or

overhead position and are known for their:

- ... Low Spatter Loss
- ... Light, Easily Removed Slag
- ... Unusual Smooth Weld Deposits
- ... Excellent Operating Characteristics

But learn all about these general-purpose electrodes for yourself. Ask for Airco Electrode Catalog No. 120A. Just fill in and mail the coupon for your copy.

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

WCN

Air Reduction
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New York 17, N. Y.

Please send me the Airco Electrode Catalog No. 120A.

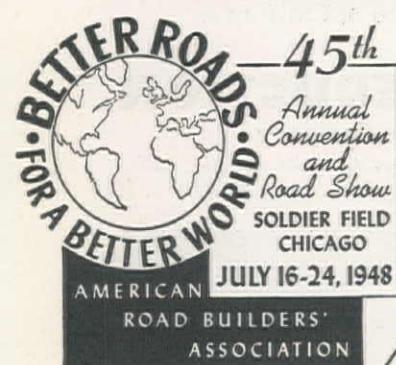
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Firm.....

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PLAN
to Come to
THE GREATEST SHOW ON EARTH
for the
CONSTRUCTION
INDUSTRY



**OVER 30
FOOTBALL FIELDS
OF EQUIPMENT**

- The Most Important highway and construction event in 1948!
- For the First Time heavy machinery exhibited and OPERATED out-of-doors!
- Brand New ideas in equipment!
- Completely new types of equipment for greater job profits!
- Discussions on pertinent Highway and Construction problems by international authorities!

If you are going to keep up with changing conditions, changing methods, changing costs and new and projected equipment, you can't afford to miss the International Road Show and Convention. Remember this is the *first Road Show since the war*—your first opportunity to see new and improved equipment first-hand. Plan to set aside July 16 to 24 for bringing yourself up-to-date on what is going on in the construction industry.

Here is a nine-day opportunity to compare all types of construction equipment, meet old friends, make new contacts and hear international authorities discuss the latest methods on the construction and maintenance of streets, roads and airports. Don't wait—Make your reservations NOW.

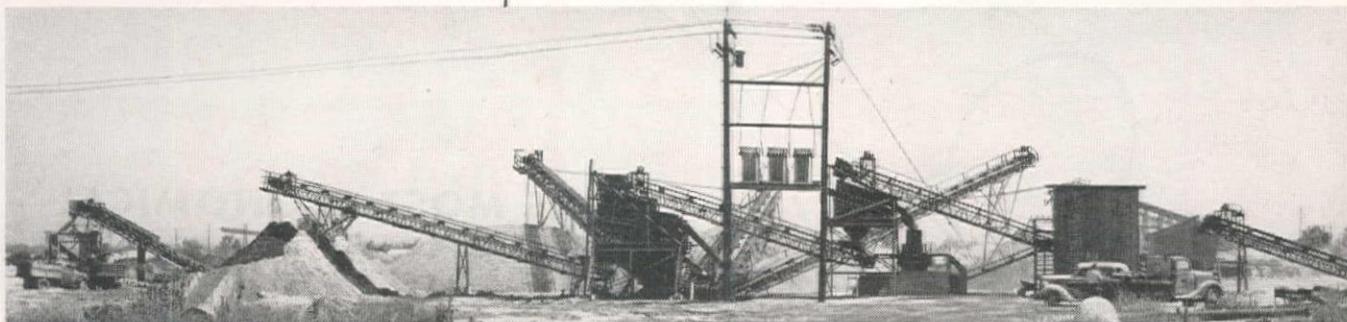
**45th ANNUAL CONVENTION AND
INTERNATIONAL ROAD SHOW**
SOLDIER FIELD • JULY 16-24, 1948

AMERICAN ROAD BUILDERS ASSOCIATION
International Building, Washington 4, D. C., U. S. A.

"We're 100% satisfied and pleased!... The superior quality of Pioneer equipment plus an efficient plant layout have given us the *lowest operating costs* of any gravel plant in the Los Angeles area!..."

-----H. L. WELLS

SIERRA ROCK PRODUCTS COMPANY
MONROVIA, CALIFORNIA



PIONEER *Continuflo*
Equipment used by Sierra Rock
Products Company in the
plant shown.

- 1—Mechanical Feeder, 30" gravel type
- 1—30"x90' Feeder Conveyor
- 1—1536 Jaw Crusher
- 1—4'x8', Double-Deck Scalping Screen
- 1—4'x12', Triple-Deck Washing Screen
- 1—32"x12' 3" Paddle Dehydrator
- 1—24"x235' Reclaiming Conveyor in 84" diameter steel culvert tunnel.
- 18" Conveyors to stockpiles

**165 tons of aggregate per hour
with 40% crushing ...**

That's the performance record built by this PIONEER plant in California. In seven months it produced and sold over 180,000 tons of crushed, screened and washed material.

No wonder H. L. Wells of Sierra Rock Products Company, Monrovia, California says, "We're 100% satisfied with every piece of PIONEER equipment".

Well matched to the western tradition of doing things in a big way, PIONEER plants and equipment have a reputation for "king size" earnings, too. For, PIONEER *Continuflo* Equipment is designed for higher output with lower upkeep . . . a combination that always assures lower operating costs.

Write today for complete information about PIONEER *Continuflo* Equipment.

PIONEER ENGINEERING WORKS, 1515 Central Avenue, Minneapolis 13, Minn.

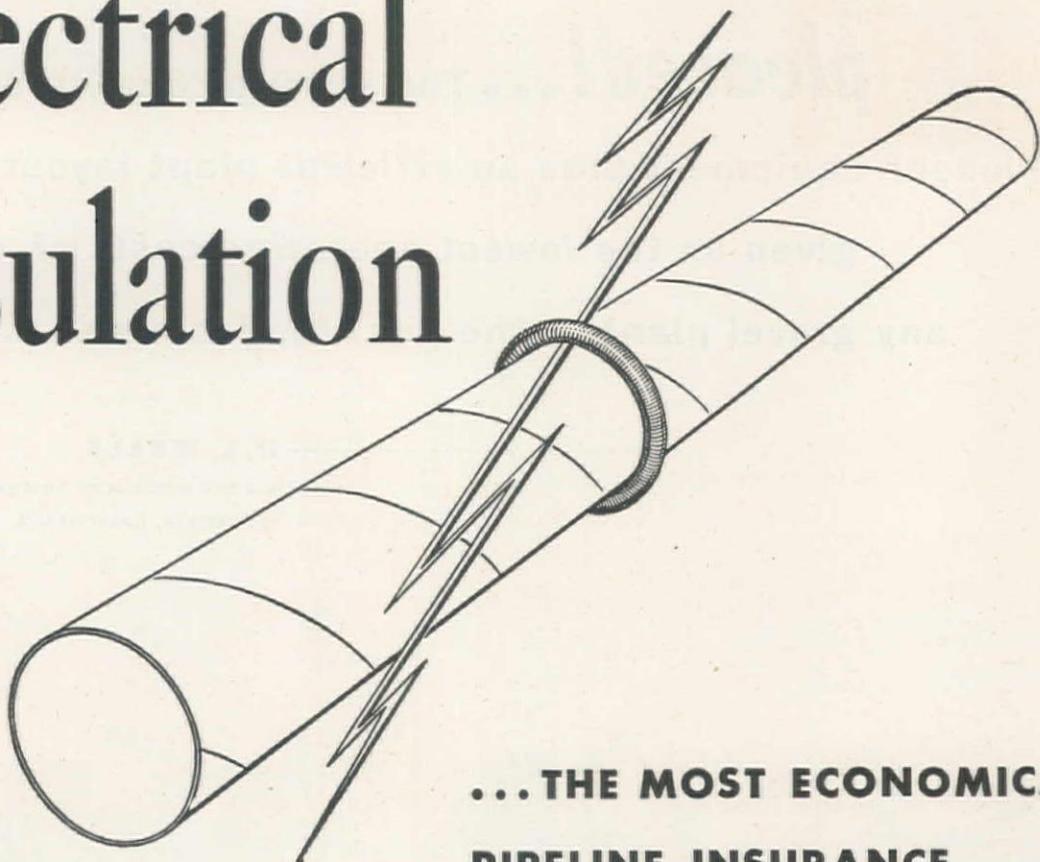
BUY BOTH!

Higher Output,
Lower Upkeep!

Pioneer
Continuflo EQUIPMENT

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

Electrical Insulation



... THE MOST ECONOMICAL PIPELINE INSURANCE YOU CAN BUY

Because they possess ability to resist moisture absorption and remain unaffected by the changes in moisture content of soils, Barrett* Coal-tar Enamels provide positive and long-lasting stability of insulation.

These coatings, applied with modern equipment by modern methods, plus electrical inspection, plus cathodic protection, produce corrosion-proof pipelines that require a minimum use of complementary electrical energy and a minimum investment in this form of electrical protection.

The sound economy of coal-tar enamels in conjunction with cathodic protection has been amply demonstrated over a long period of years in all types of soil and climatic conditions.

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.

THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

*Reg. U. S. Pat. Off.



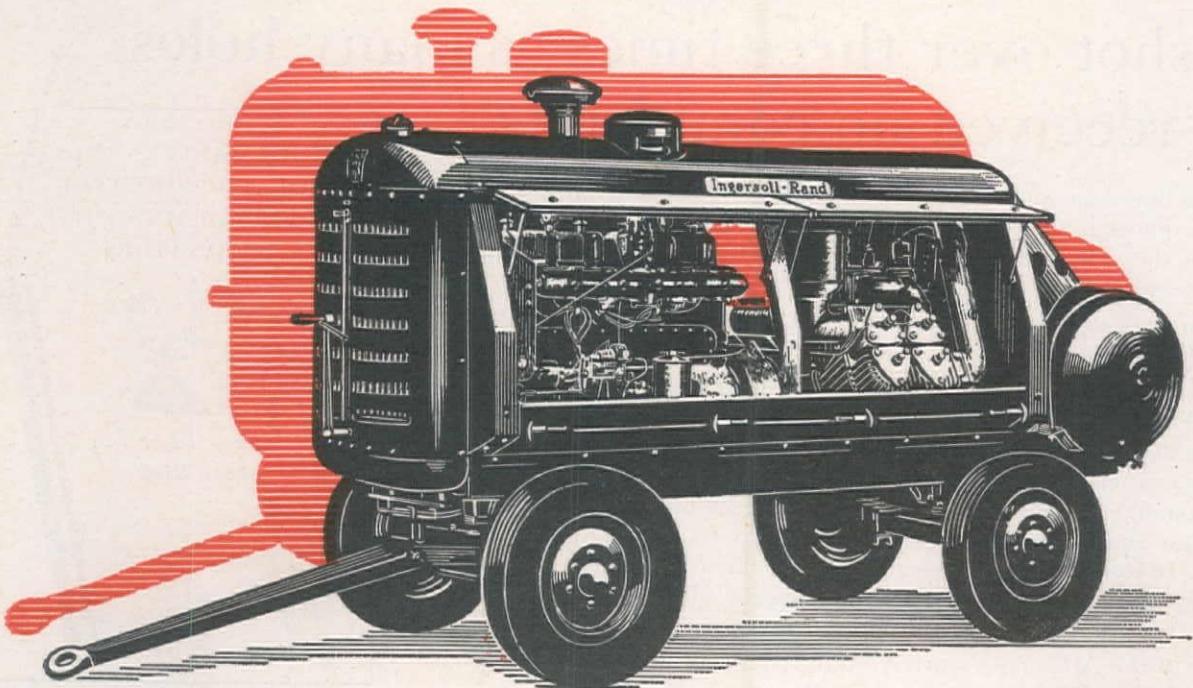


for men who demand Quality in a Portable Compressor

A MOBIL-AIR Compressor gives you the same smoothness and reserve of power, the same beauty of a job well done, the same fitness to do its job, and the same ruggedness and stamina that you demand in every top-quality machine.

Perhaps you have always used Ingersoll-Rand portable compressors, or you may always have wanted one. It's natural for men to desire possession of the finest machines, and to want to work with them.

If you are not able to get the size MOBIL-AIR Compressor you need when you need it, you may find it worth waiting for . . . one of the new KA-Series MOBIL-AIR equipped with the Drill-More Regulator.



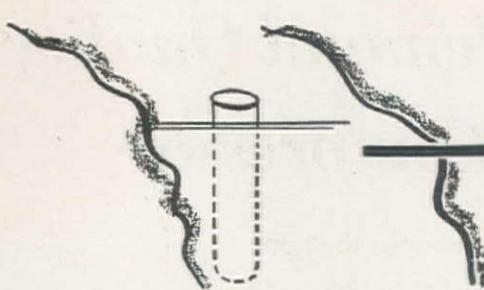
COMPRESSORS • AIR TOOLS
ROCK DRILLS • TURBO BLOWERS
CONDENSERS • CENTRIFUGAL PUMPS
OIL AND GAS ENGINES

Ingersoll-Rand

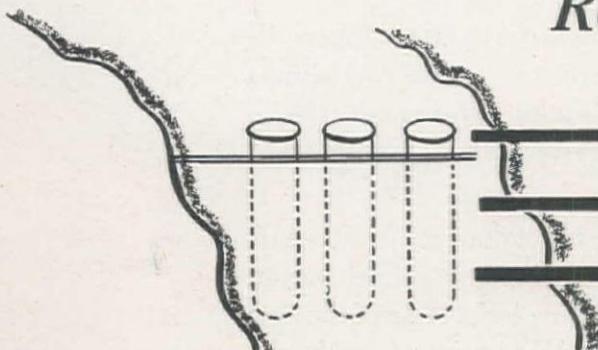
11 BROADWAY, NEW YORK 4, N. Y.

152-2

Yesterday... by Ordinary Blasting Methods



Today... by the
Rockmaster Blasting System



**"We shot over three times as many holes
and received no complaints!"**

A big limestone quarry received so many complaints about noise and vibration that they were forced to cut way down on the number of holes they could fire by standard methods. Costs per ton of rock went soaring.

Then they called in Rockmaster—and quickly found that with the Rockmaster system they could fire over three times as many holes with approximately four times as much dynamite without receiving complaints. And this is not an isolated case, by any means.

This fact alone is important to quarries, construction jobs and coal stripping operations, but there is more to it than the mere silencing of complaints. The Rockmaster system gives better fragmentation, far less "back-break" in quarries and less pulverizing of coal in strip pits. It frequently happens that the Rockmaster system permits a wider spacing of drill holes with a saving of drilling and explosives cost, too.

Call in the Atlas representative today. He will be glad to give you the benefit of Atlas pioneering in milli-second delay blasting.

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

Offices in Principal Cities

ATLAS EXPLOSIVES
"Everything for Blasting"

SAN FRANCISCO 4, CAL.

ATLAS POWDER COMPANY

SEATTLE 1, WASH.

ROCKMASTER GIVES
YOU THE GREATER
SAFETY OF MANASITE
DETONATORS



*Less Bark...
More Bite*



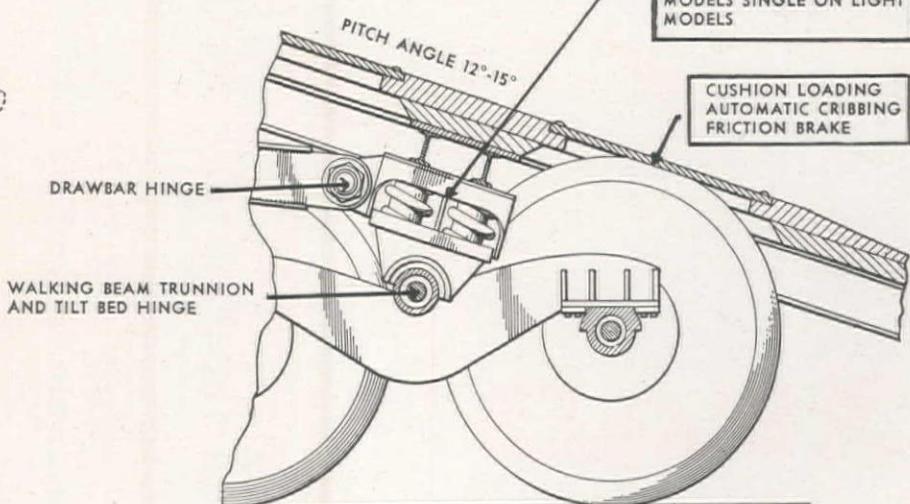
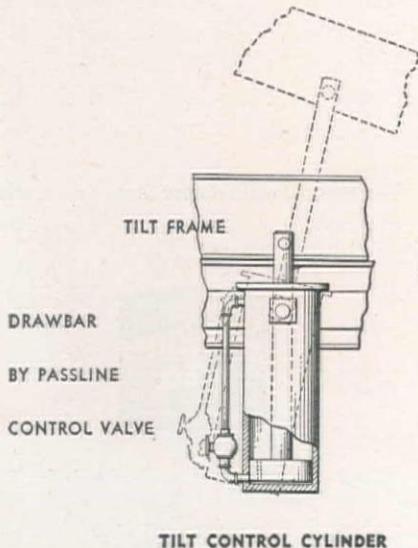
Tilt Beds

DU FOSTER TRAILER



TRAILER SPECIFICATION
 DECK LENGTH 20' - 0"
 DECK WIDTH 8' - 0"
 DECK HEIGHT 40"
 OVERALL LENGTH ... 24' - 6"
 WEIGHT 9000#
 TIRES... Eight 9:00 x 15 - 12 ply
 TARE WEIGHT 8900#

IF IT TILTS RIGHT IT'S A FOSTER



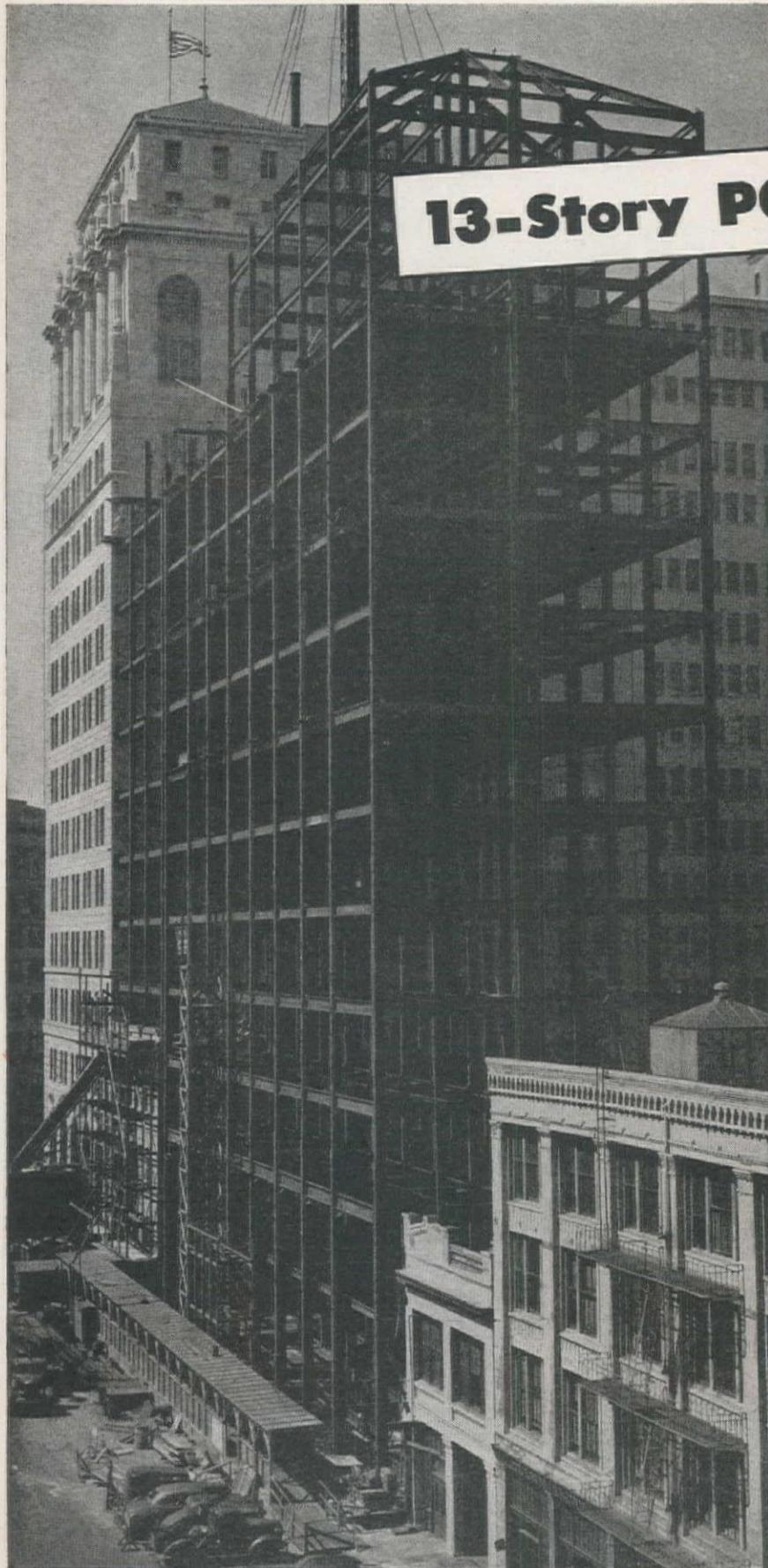
Standard Models range from 3 to 30 ton, Semi and Pole Type
 Write for descriptive literature, specifications, and prices

FOSTER TRAILER COMPANY, INC.

2029 SACRAMENTO STREET

• LOS ANGELES 21

• PHONE TU 6463 and VA 2743



13-Story PG & E Annex

Steelwork by
**BETHLEHEM
PACIFIC**

Another peak has been added to San Francisco's skyline. The new 13-story office-building annex of the Pacific Gas and Electric Company is the tallest steel structure built on the West Coast since 1930.

Bethlehem Pacific fabricated and erected the 2000-ton steel framework for this building. The first steel column was raised June 19, 1947 and the erection contract was completed September 23, 1947, a total of 69 working days.

Bethlehem Pacific is organized and equipped to handle efficiently fabricated steel contracts of any tonnage. Structural steel rolling mills are located at South San Francisco, Los Angeles and Seattle. Fabricating works are located at South San Francisco, Alameda and Los Angeles.

Bethlehem Pacific Coast Steel Corporation

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



PG & E office-building annex, Beale St., San Francisco. Steelwork: Bethlehem Pacific. General Contractor: Cahill Bros., Inc. Architects: Arthur Brown, Jr. and John Blakewell, Jr. Associate Architects: Weisse, Frick and Kruse.

BETHLEHEM PACIFIC

Heavy Loads



at Rubber-Tired Speeds

- Now available with 18.00 x 26 industrial tires the Case "LAI" brings new capability to rubber-tired traction. Its individually-controlled hydraulic brakes bring new ease to stopping and to steering. Its comfortable seat and convenient controls conserve the operator's time and strength.

The "LAI" is built even better than the prior "LI," long famous for ENDURANCE. It runs in high gear . . . as much as the job may call for . . . without running up its maintenance costs. It rolls from job to job on its own rubber, takes no special transport equipment.

Teamed up with earth-handling equipment to match, it fills the gap between smaller outfits that accomplish too little and bigger units that may cost too much for the work to be done. Adapted to four-yard dig-and-carry scrapers, one-yard loaders and other units of comparable size, it strikes a happy balance of pull and speed, cost and capacity.

- Here the “LAI” powers a hydraulic shovel-loader that digs, lifts, carries, and dumps quickly or slowly as desired.



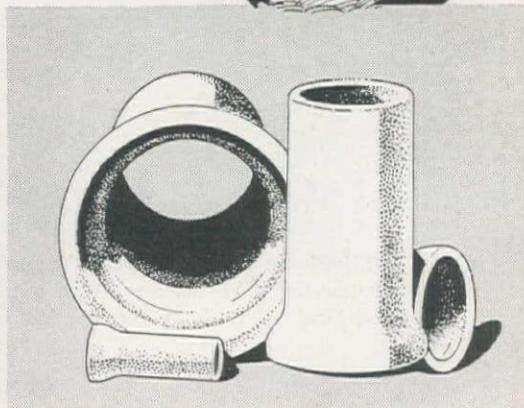
- Equipped for complete hydraulic control, the Case "LAI" hustles the haul with this 4-yard dig-and-carry scraper.



- Hooked to the old reliable sheep's-foot roller, the "LAI" handles the job of earth packing effectively and economically.

CASE

State Tractor & Equipment Co.	Phoenix, Arizona
Brown-Bevis Equipment Co.	Los Angeles, Calif.
Coast Equipment Co.	San Francisco, Calif.
Liberty Truck & Parts Co.	Denver, Colo.
Western Equipment Co.	Boise, Idaho
Hall-Perry Machinery Co.	Buffe, Montana
Las Vegas Truck & Equipment Co.,	Las Vegas N. Mex.
Nelson Equipment Co.,	Portland, Ore.—Seattle, Wash.
Robison Machinery Co.	Salt Lake City, Utah
Worham Machinery Co.,	
	Cheyenne, Sheridan and Greybull, Wyoming



CONCRETE SEWER PIPE

*is made RIGHT in
your own district*

When the pipe you need is produced by a member of California Associated Concrete Pipe Manufacturers you can be certain it is made right.

For sewers and storm drains diameters range from 4" to 120" and in every size the pipe meets the exacting specifications of the ASTM and the Federal Government. Using local labor and local capital, local materials and convenient local delivery, it's made for maximum performance and maximum life.

Write for the names of your nearest manufacturer-members of . . .

**CALIFORNIA ASSOCIATED
CONCRETE PIPE
MANUFACTURERS**
P.O. BOX 152 FRESNO 7
CALIFORNIA



"We have used Timken® Bits for a number of years and we are very much satisfied with them"

—says R. G. Watkins & Son, Inc.

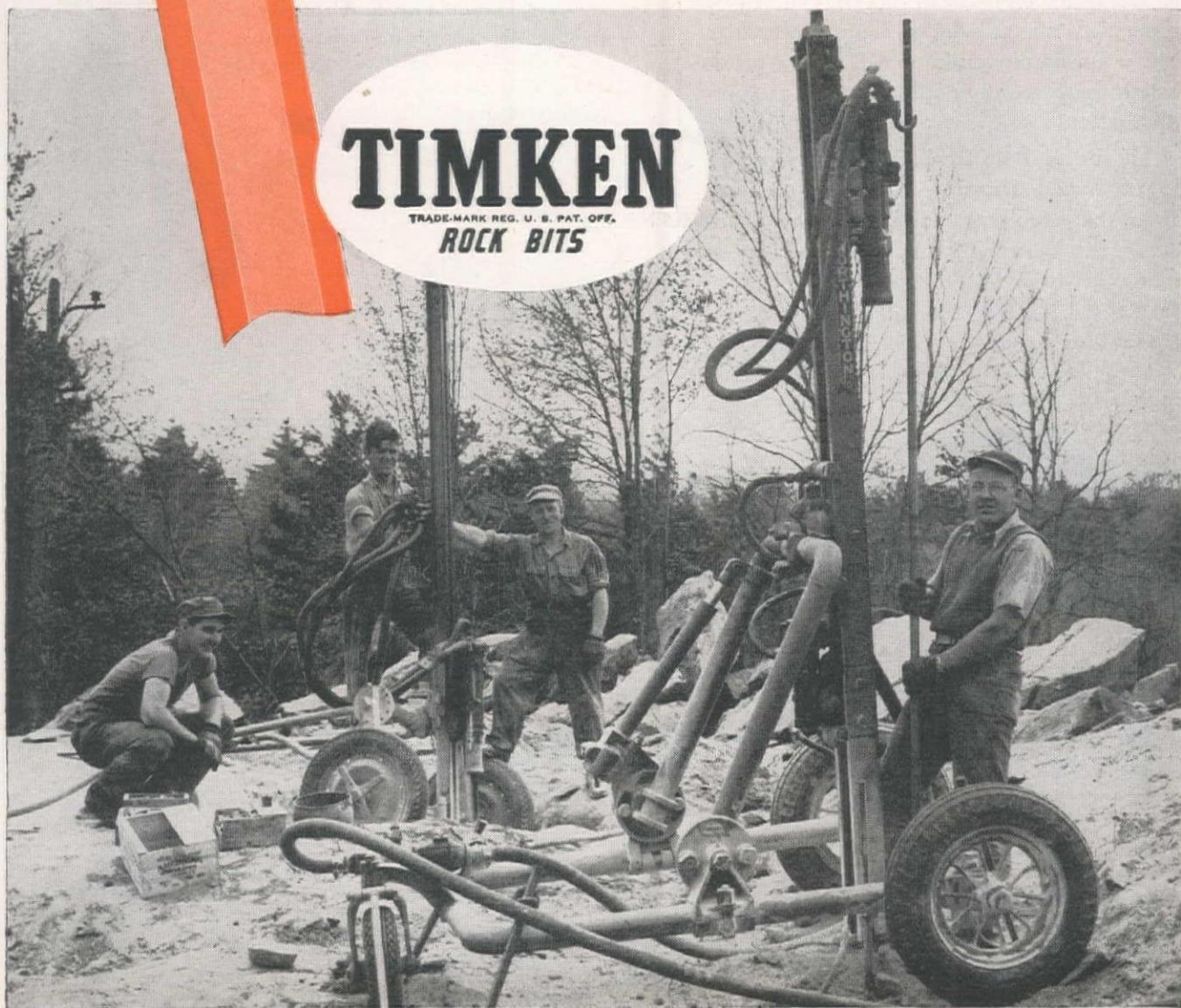
R. G. Watkins & Son, Inc., Amesbury, Massachusetts, has enjoyed many years of successful operation as a general contractor in the New England area, hence is in a position to evaluate authoritatively the performance of construction equipment of all kinds — including rock bits. Nothing we might add to the statement quoted above, therefore, could make it any stronger.

The photographs reproduced here show rock drilling operations in connection with the construction of a new scenic highway being built by R. G. Watkins, Inc., for the State of New Hampshire, primarily for the attraction of tourists. On the rock removal part of the job the contractor is using 5 pneumatic hammers, 3 wagon-drills and 3,315 ft. compressors.

Are you paying more than you should for rock drilling? You are if you are not using Timken Rock Bits. It will pay you to investigate now.

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO
CABLE ADDRESS "TIMROSCO"

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

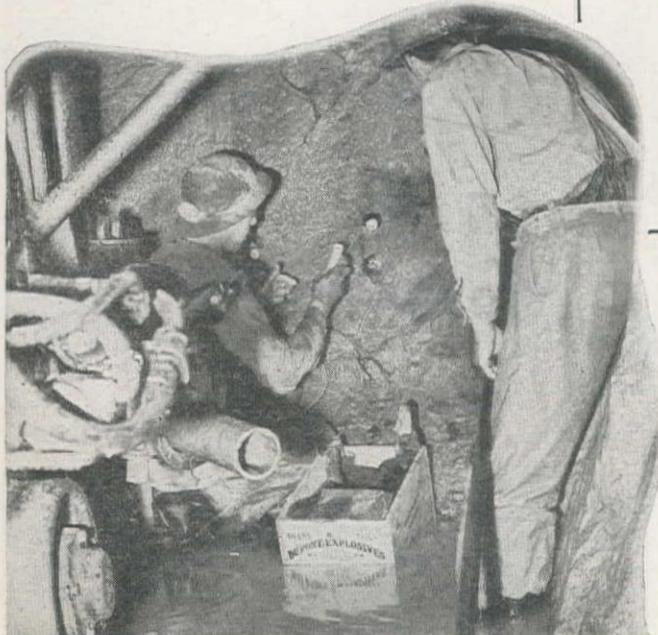


WHEN YOU'RE DRIVING A TUNNEL... these Du Pont products help you keep ahead of job schedules

Today, high-speed tunneling calls for top efficiency to keep ahead and stay ahead of schedules. That is why so many contractors rely upon these well-known Du Pont products to help see their jobs through to completion.

Ask the Du Pont Explosives representative in your own district for complete information about these preferred and widely used products. They are ideal for efficient, high-speed tunnel driving.

E. I. du Pont de Nemours & Co. (Inc.),
Hoge Bldg., Seattle, Wash.—Old National
Bank Bldg., Spokane, Wash.—Midland Sav-
ings Bldg., Denver, Colo.—111 Sutter Street,
San Francisco, Calif.



(a check list for contractors)

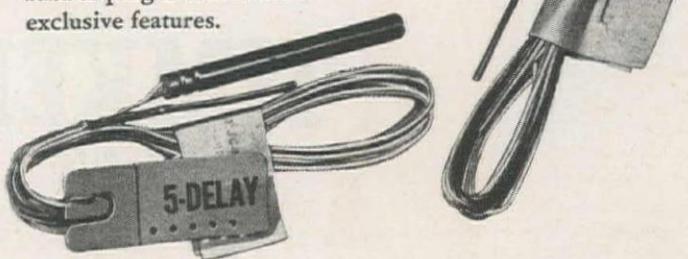
DU PONT SPECIAL GELATIN—the right dynamite for tunnel work because it has tremendous shattering power. Extremely water-resistant. Helps you keep going even under the wettest conditions. Available in perforated cartridges that eliminate need for slitting. Best fumes.



DU PONT "GELEX"—an economical, semi-gelatinous dynamite. Moderately water-resistant. Suitable for most all tough-going tunnel jobs. Also available in perforated cartridges. Excellent fumes.



DU PONT ELECTRIC BLASTING CAPS (Instantaneous and Delay) are the most widely used on the market . . . and for good reason. They're more dependable . . . safer. Nylon insulated wires and rubber plug closures are exclusive features.



QUICK-SEAL TAMPING PLUGS speed and simplify stemming operations. Plugs fit drilled holes . . . readily expand when tamped. Available in diameters of 1 1/2, 1 3/4, 2, and 2 1/4 inches.



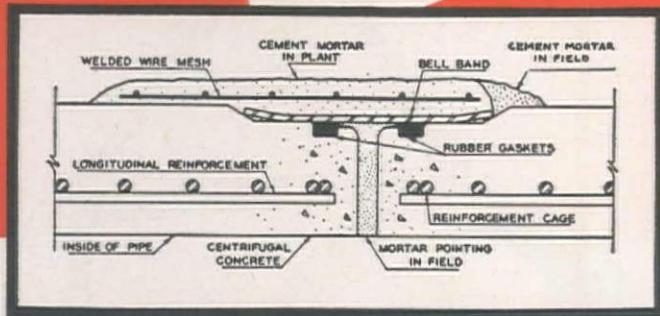
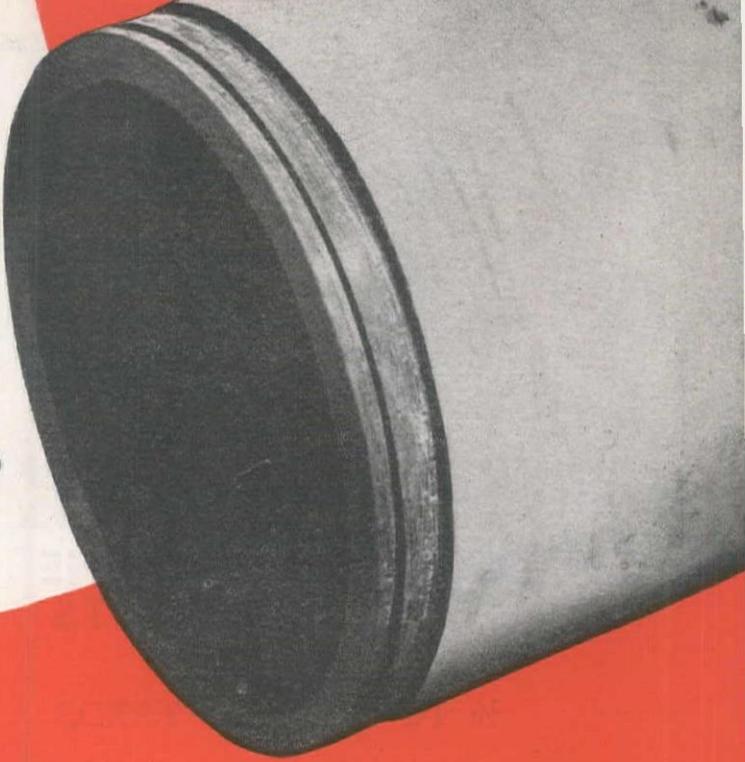
DU PONT EXPLOSIVES

*Blasting Supplies and Accessories
for the Builders of America*

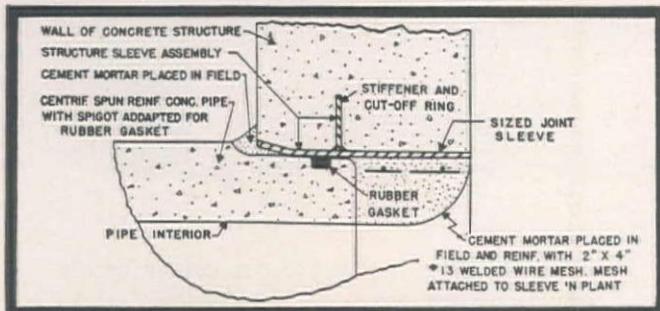


BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

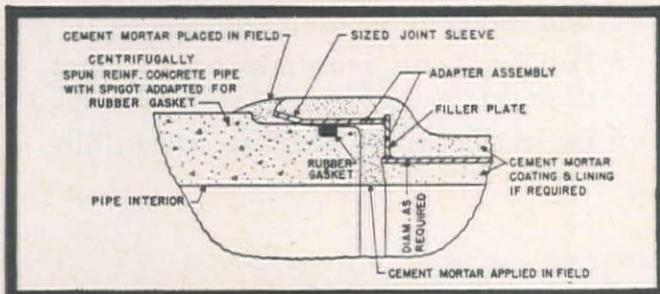
Solution for many Pipeline closure Problems



Cross section of completed field joint. Rubber gaskets are compressed into spigot grooves by accurately-sized steel bell band. In reality a bell and spigot rubber sealed joint, it often enables installation savings which alone more than compensate for the nominal additional cost.



Typical connection to a concrete structure—illustrating easy placement with ample flexibility for security against reasonable conditions of expansion, contraction or earth settlement.



Typical connection to a fabricated steel fitting—an example of adaptability to many different situations.

The Double Rubber Gasket Joint for centrifugally spun reinforced concrete pressure pipe is simple, flexible, adaptable. This view of the rubber gasket groove in the spigot end of the pipe illustrates the exacting workmanship involved in its manufacture.

A proven refinement of an already outstanding product . . . developed by American

The advantages of centrifugally spun reinforced concrete pressure pipe for moderate operating heads (generally under 150') have become well established in this country during the past twenty-five years. High initial and sustained carrying capacity, permanence, and economy are some of the proven characteristics of Hume Centrifugal Concrete Pressure Pipe.

In recent years, development by this company of the Double Rubber Gasket Joint for centrifugally spun pipe has greatly increased its versatility and adaptability. It is proving outstandingly successful in a wide variety of installations throughout the West.

This joint is another example of American's ingenuity and skill in the development of better products for water supply lines. Complete specifications and engineering drawings giving dimension tables are available to engineers upon request.

American
PIPE AND CONSTRUCTION CO.

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

P. O. Box 3428, Terminal Annex, Los Angeles 54, California
District Offices and Plants — Oakland, San Diego, Portland, Oregon

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.

There's a "Tailor-made" Hendrix

...to fit YOUR job, save YOU money!

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

3/8 TO 40 CUBIC YARDS

**WITH OR WITHOUT
PERFORATIONS**



3 TYPES DESIGNED FOR EVERY DIGGING CONDITION

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

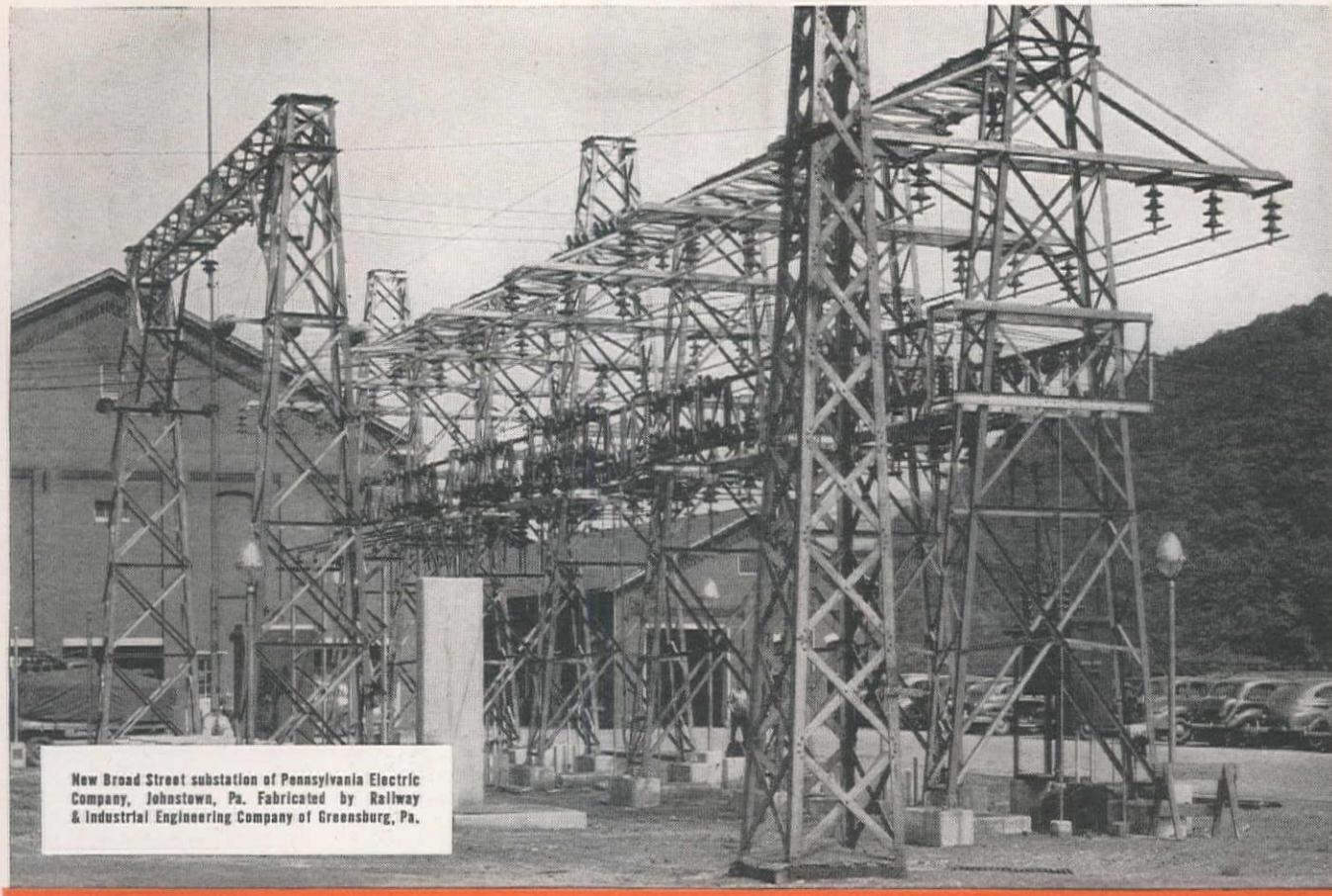
TS A medium weight bucket, classified as a general purpose bucket.

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

- ★ 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.

WRITE FOR DESCRIPTIVE LITERATURE OR ASK YOUR DEALER

HENDRIX MANUFACTURING COMPANY
MANSFIELD INCORPORATED LOUISIANA



ALL-ALUMINUM SUBSTATIONS

cut erection time 75%, maintenance cost to zero

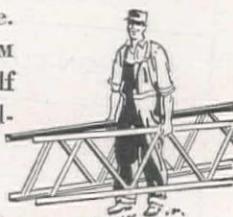
In only 14 working hours, a 5-man inexperienced crew working without a crane, erected the strong, lightweight Alcoa Aluminum supporting members of this all-aluminum substation. It would have taken at least a week to 10 days' time, and a crane, to erect a similar structure built of ordinary heavy metal.

And there will be no periodic shutdowns of the electrical circuits in order to paint the structure. Aluminum cannot rust, needs no paint or protection even in industrial atmospheres.

Alcoa Aluminum Tubular Bus make up the electrical circuits of this substation. They're a special elec-

trical grade of aluminum that gives high current-carrying efficiency. You have your choice of Alcoa Aluminum Bus Conductors in many sizes, and four shapes . . . tubular, channels, angles, and flat bars. There are Alcoa Aluminum Fittings for each size and shape.

Design your substations "ALL-ALUMINUM" . . . to save time, money, inconvenience. We'll be glad to help. ALUMINUM COMPANY OF AMERICA, 1811 Gulf Building, Pittsburgh 19, Pennsylvania. Sales offices in leading cities.

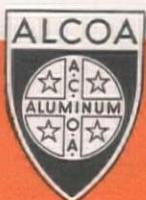


MORE PEOPLE WANT MORE ALUMINUM FOR MORE USES THAN EVER

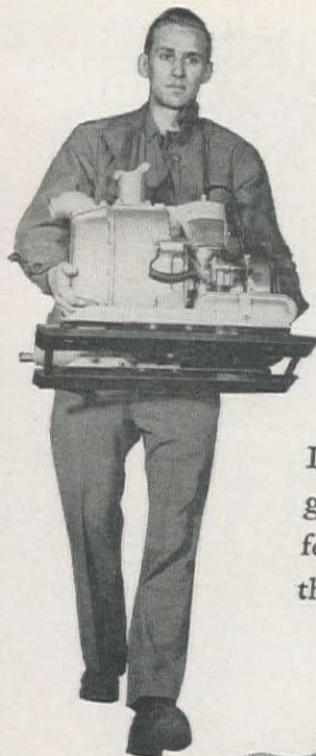
ALCOA

FIRST IN
ALUMINUM

IN EVERY COMMERCIAL FORM

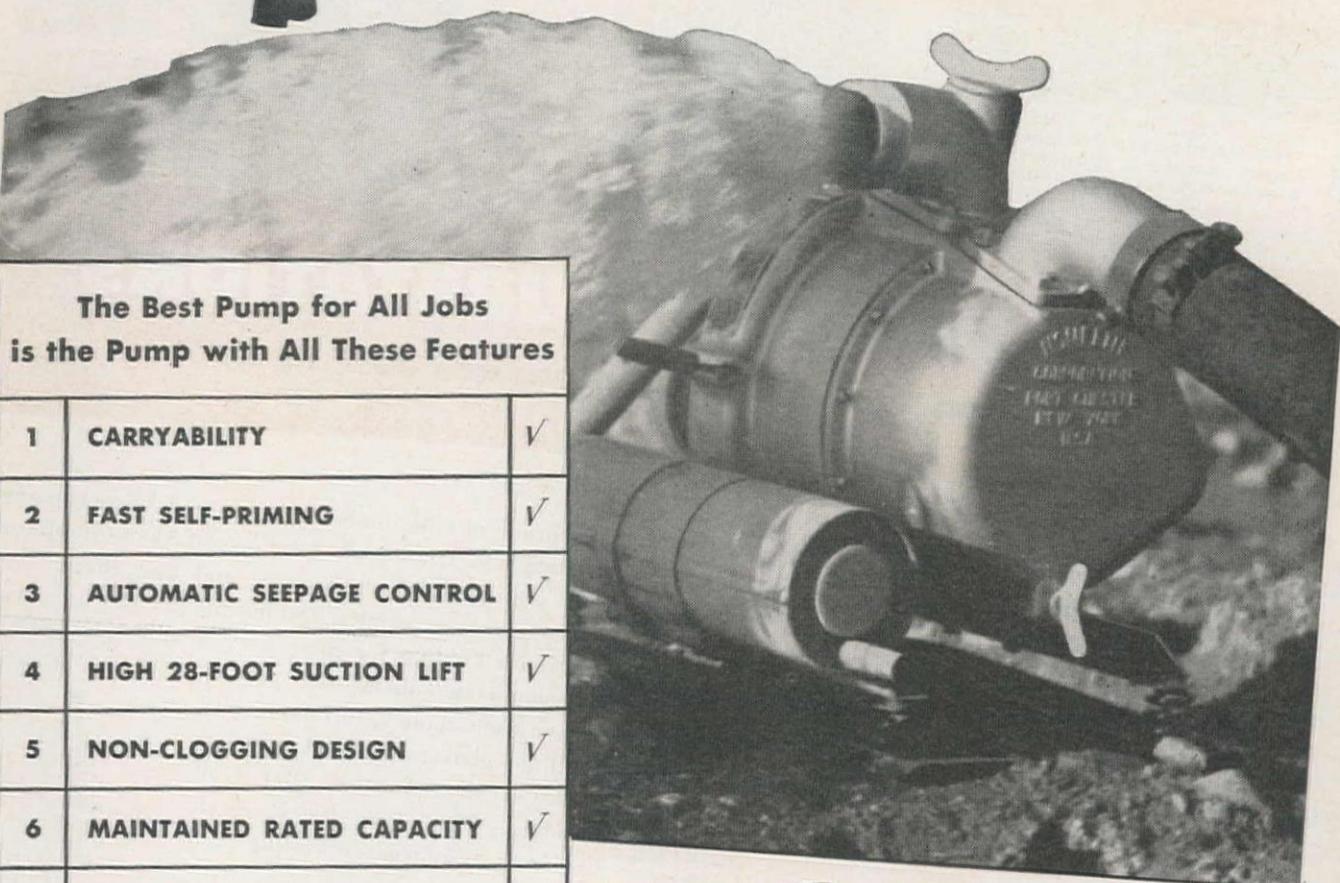


REG. T. M.



Homelite Carryable Pump ...with 9 Big Features

It weighs only 85 pounds... complete with built-in high-powered gasoline engine... and when it comes to performance, its nine big features are nine big reasons why a Homelite *Carryable Pump* is the best pump for all jobs... *your* jobs.



**The Best Pump for All Jobs
is the Pump with All These Features**

1	CARRYABILITY	✓
2	FAST SELF-PRIMING	✓
3	AUTOMATIC SEEPAGE CONTROL	✓
4	HIGH 28-FOOT SUCTION LIFT	✓
5	NON-CLOGGING DESIGN	✓
6	MAINTAINED RATED CAPACITY	✓
7	DISCHARGE PRESSURE	✓
8	DEPENDABILITY	✓
9	SIMPLE DESIGN AND OPERATION	✓

See for yourself

Write today for our new illustrated bulletin No. L-503 that tells the *complete* story and shows how you can get faster, better pumping with Homelite *Carryable Pumps*.

HOMELITE

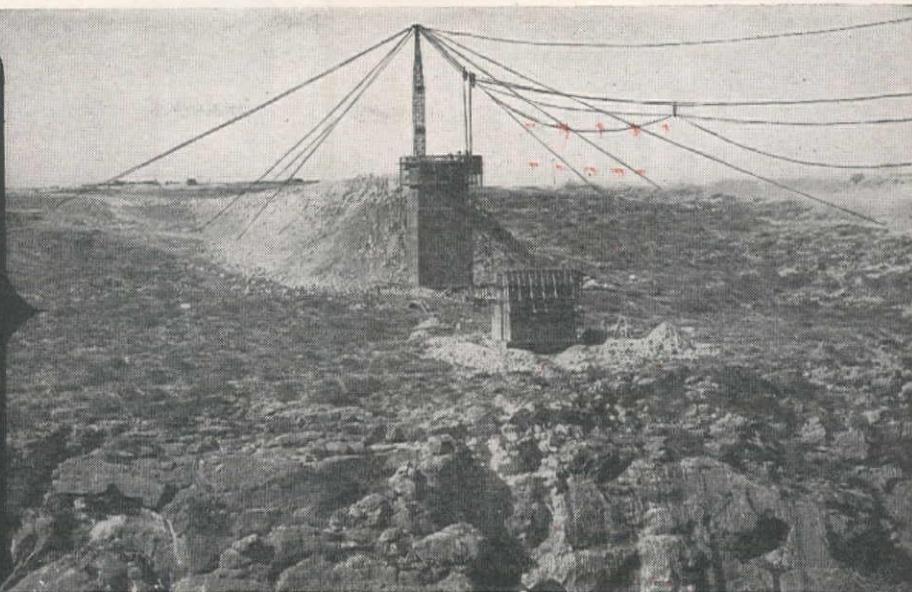
CORPORATION

1303 RIVERDALE AVENUE, PORT CHESTER, NEW YORK
MANUFACTURERS OF HOMELITE CARRYABLE PUMPS • GENERATORS • BLOWERS • CHAIN SAWS

WESTERN CONSTRUCTION NEWS—March, 1948

A LIDGERWOOD CABLEWAY

handles the forms
and places
concrete for



Pecos High Bridge NEAR DEL RIO, TEXAS.

1390-ft. continuous cantilever structure with 15,455 cubic yards of concrete in sub-structure. Built by Brown & Root, Inc., Contractors, of Houston, Texas, for Southern Pacific Lines.



THE WORLD'S STANDARD FOR OVER FIFTY YEARS

Lidgerwood Cableways have set new records in speed, efficiency and dependability for construction of dams, bridges, viaducts, locks, filtration and sewage disposal plants, dry docks and similar structures. Also for stock piling and reclaiming.

Built for loads from 5 to 150 tons with clear spans up to 3500 feet—stationary, traveling, radial—steam, electric, gasoline, diesel.

LIDGERWOOD

ESTABLISHED 1873

MANUFACTURING
COMPANY

Send for your copy of
Cableway Bulletin C-111

MAIN OFFICE: 7 DEY STREET, NEW YORK 7, N. Y.
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WORKS: SUPERIOR, WISCONSIN • BEACON, NEW YORK • CABLE ADDRESS—BROSITES, N. Y.

HUBER Says it with SAVINGS!

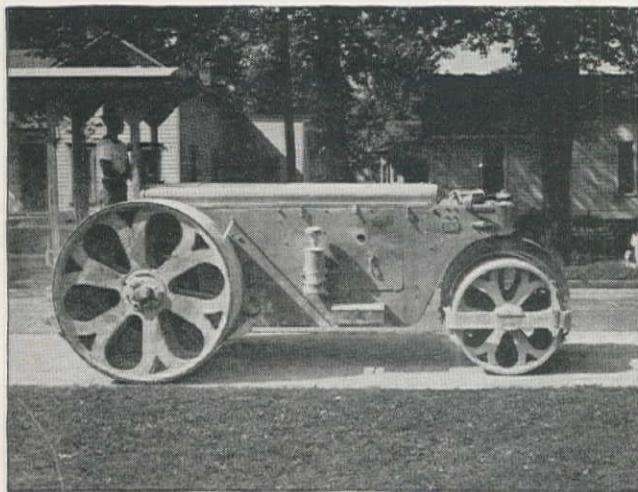


A profitable machine that will serve you well as a bulldozer, scraper, lift-loader, patch roller, snowplow or rotary broom on light maintenance jobs.

Huber Road Rollers and Maintainers are not time-out "prima donnas". They are 'round-the-clock, day in - day out husky workers with jobs to do and a knack of doing them well. Speed - Power - Economy - are the three virtues that follow Huber Road Machinery on every road building or maintaining project and they are backed with the common sense engineering

that only many years of experience in designing and building road machinery could possibly put into them.

That is why we urge you to visit your nearest Huber Distributor for a demonstration. As an experienced road man - you will be glad you did.



HUBER 3-WHEEL ROAD ROLLER
Automotive type, built in sizes from 5 to 12 tons.



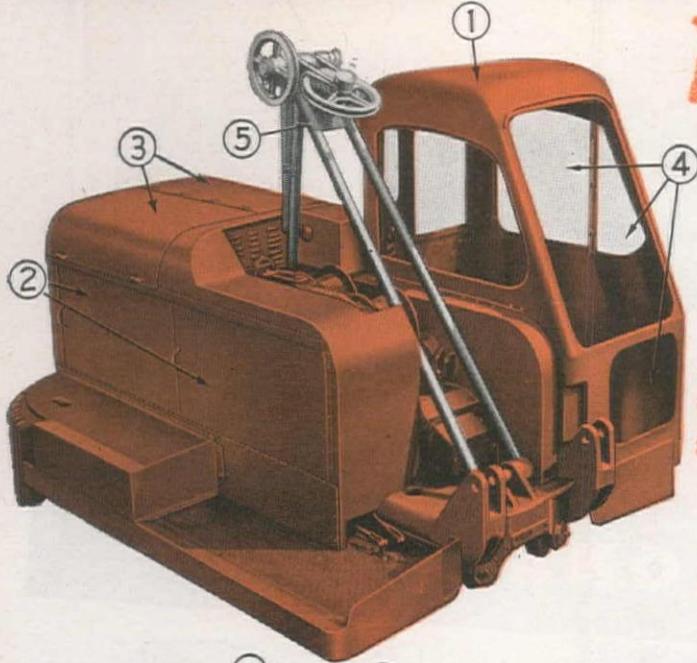
HUBER TANDEM ROLLERS
Variable weight, built in sizes from 3 to 12 tons.

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

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EDWARD F. HALE CO. San Francisco 7, California
FOULGER EQUIPMENT CO., INC. Salt Lake City 8, Utah
THE COLORADO BUILDERS' SUPPLY CO., Denver 9, Colorado
THE COLORADO BUILDERS' SUPPLY CO., Scotts Bluff, Nebr.
THE COLORADO BUILDERS' SUPPLY CO. Casper, Wyoming

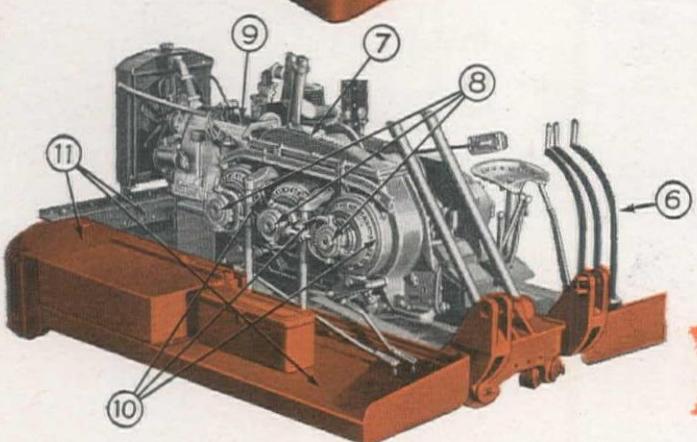
Look into UNIT!



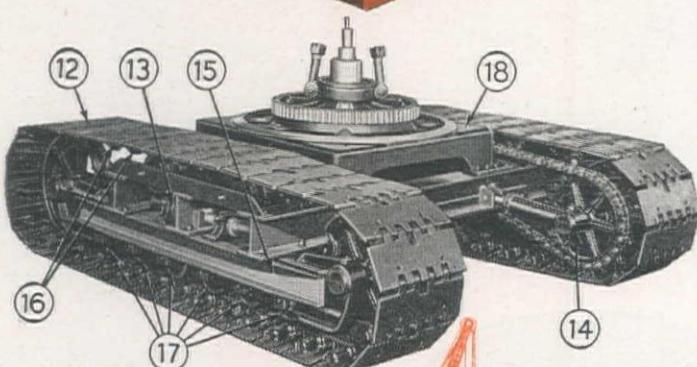
FULL VISION CAB

1. Streamlined to the minute in design . . . operator can see in ALL directions . . . clear visibility around a complete 360° circle, without sacrificing weight, capacity, or headroom.
2. Sliding side panels provide accessibility to motor and clutches.
3. Easily lifted top hood covers . . . locked from within the cab.
4. Shatter-proof Safety Glass used throughout the entire cab.
5. A Frame front legs and end connections are one-piece drop forgings.

MAIN MACHINERY



6. Curved operating levers . . . for easy operation and control.
7. One-piece cast gear case completely encloses all gears and shafts in a constant flow of oil . . . Positive protection for all moving parts. Bored for perfect alignment by machine designed specifically for this accurate operation . . . misalignment is impossible.
8. Heat-treated alloy steel gears and shafts are involute splined. No keys to replace . . . no worn-out keyways. Large diameter shafts with short spans between bearings . . . minimizes deflection and bending . . . reduces bearing replacement.
9. Gas or Diesel engines are mounted in straight line with main machinery. Worm driven power take-off . . . silent, efficient, and compact.
10. All operating clutches are disc type . . . interchangeable . . . simple adjustment . . . mounted on high-speed counter-shafts instead of directly to drum shafts . . . smoother operation and longer life.
11. Turntable, Platforms, and Counterweight . . . These three important members are perfectly aligned, forming a single rigid unit that provides extra resistance to shocks and strains.



LOWER STRUCTURE

12. Multiple hinged shoes maintain alignment . . . minimize wear of shoes and tumblers.
13. Single adjusting screw for adjusting tread belt and drive chain enclosed in grease, free from dirt, rust, or outside damage.
14. One-piece end bearings with added outboard bearings maintain perfect and permanent alignment of drive shaft and end roller shaft.
15. Husky trussed frame . . . reinforced by one-piece end castings.
16. Drive Sprocket guides . . . prevent treads from jumping off if operating too loose.
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18. Heavily ribbed and flanged lower frame (carbody) of annealed alloy steel . . . roller track cast integral with body.

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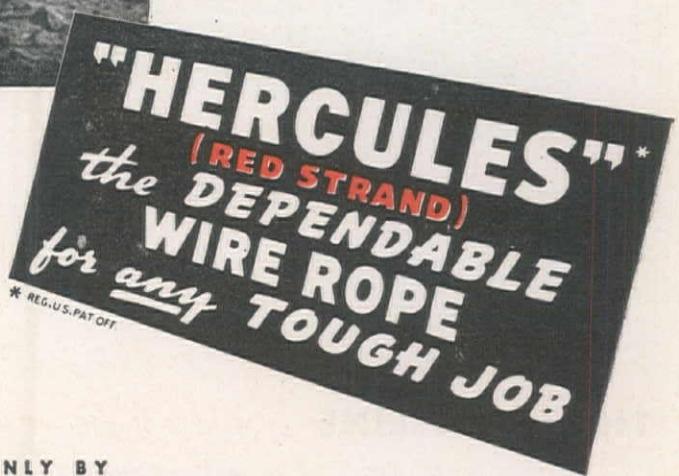


Men who use shovels or similar types of heavy duty material handling equipment, need not be reminded of the important part that wire rope plays in determining their final production costs.

Experience has proved that the longer a rope lasts, the lower is its cost per unit of work done. Less time, too, is wasted in making replacements.

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Producing 1,100,000 tons of aggregates

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service has helped Morrison-Knudsen complete their contracts on time.

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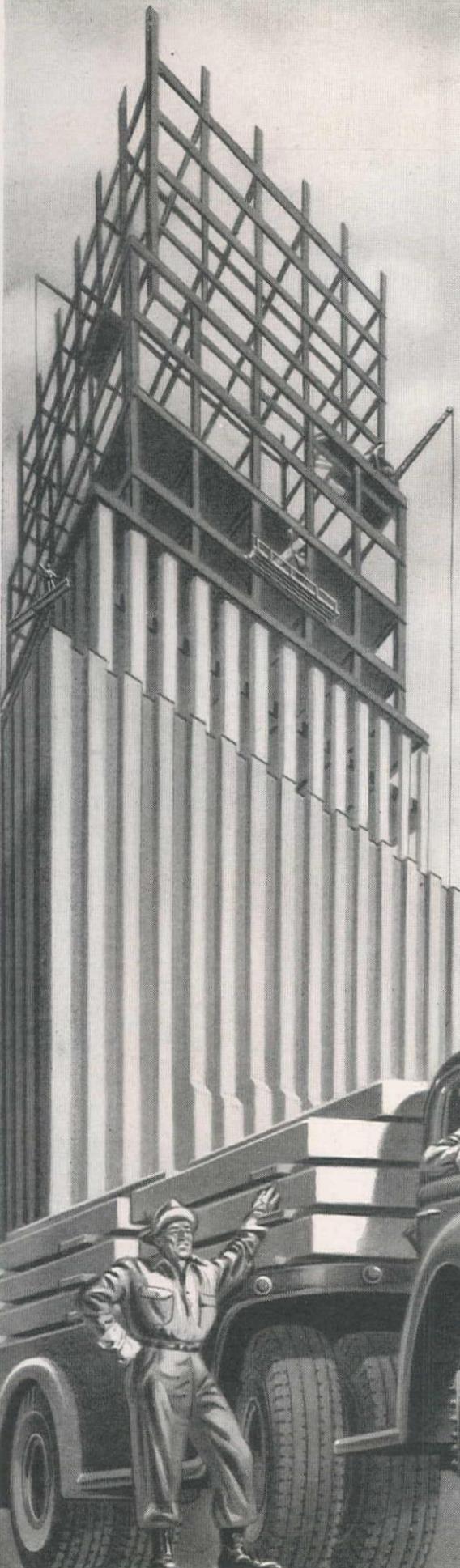
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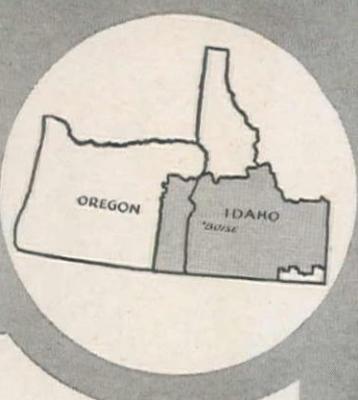
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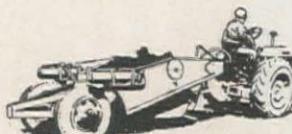
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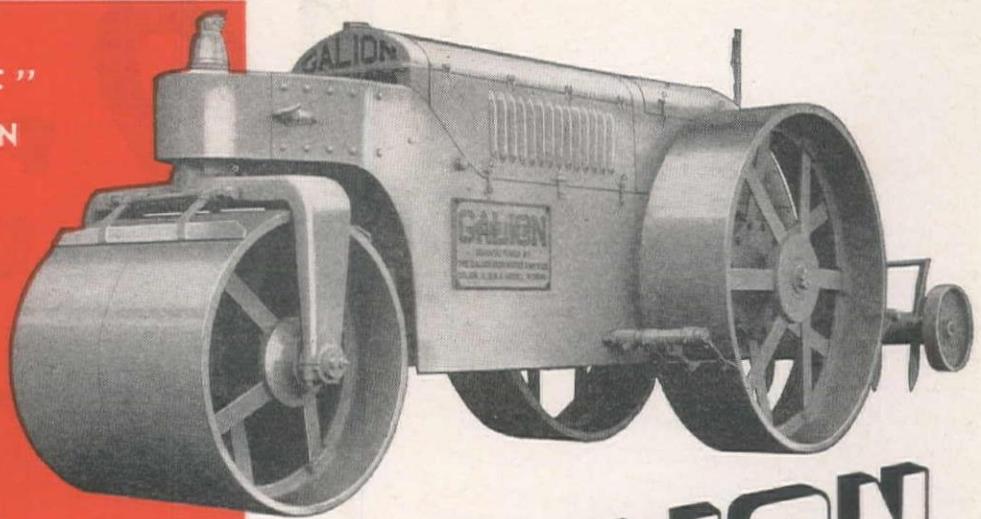
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FOR LOWEST POSSIBLE COST
PER YARD..PER JOB..PER YEAR

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10 & 12 TON
SIZES



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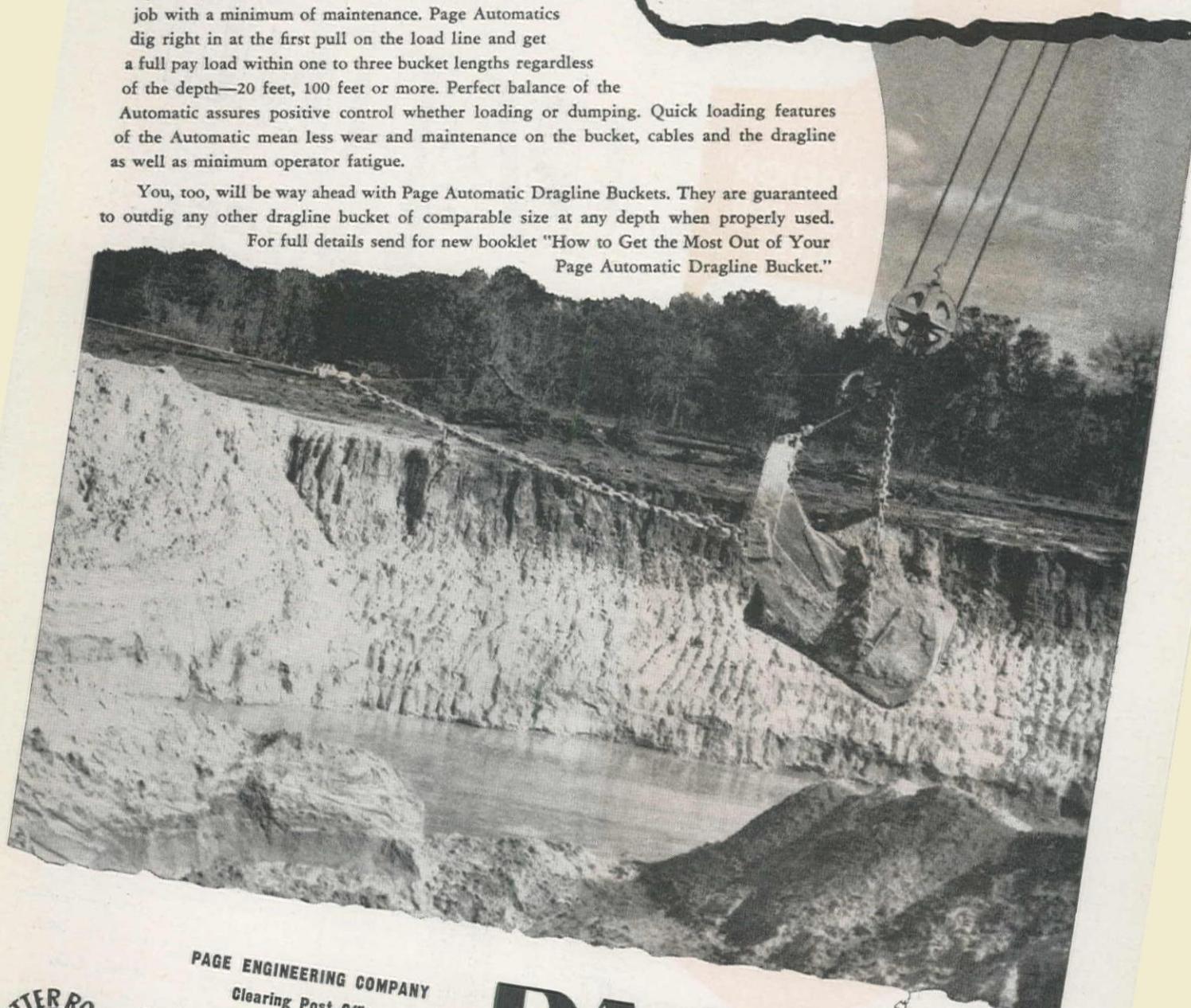
Like all Page Buckets, they are built to do a specific job and are heavy enough to stand up on the job with a minimum of maintenance. Page Automatics dig right in at the first pull on the load line and get a full pay load within one to three bucket lengths regardless of the depth—20 feet, 100 feet or more. Perfect balance of the Automatic assures positive control whether loading or dumping. Quick loading features of the Automatic mean less wear and maintenance on the bucket, cables and the dragline as well as minimum operator fatigue.

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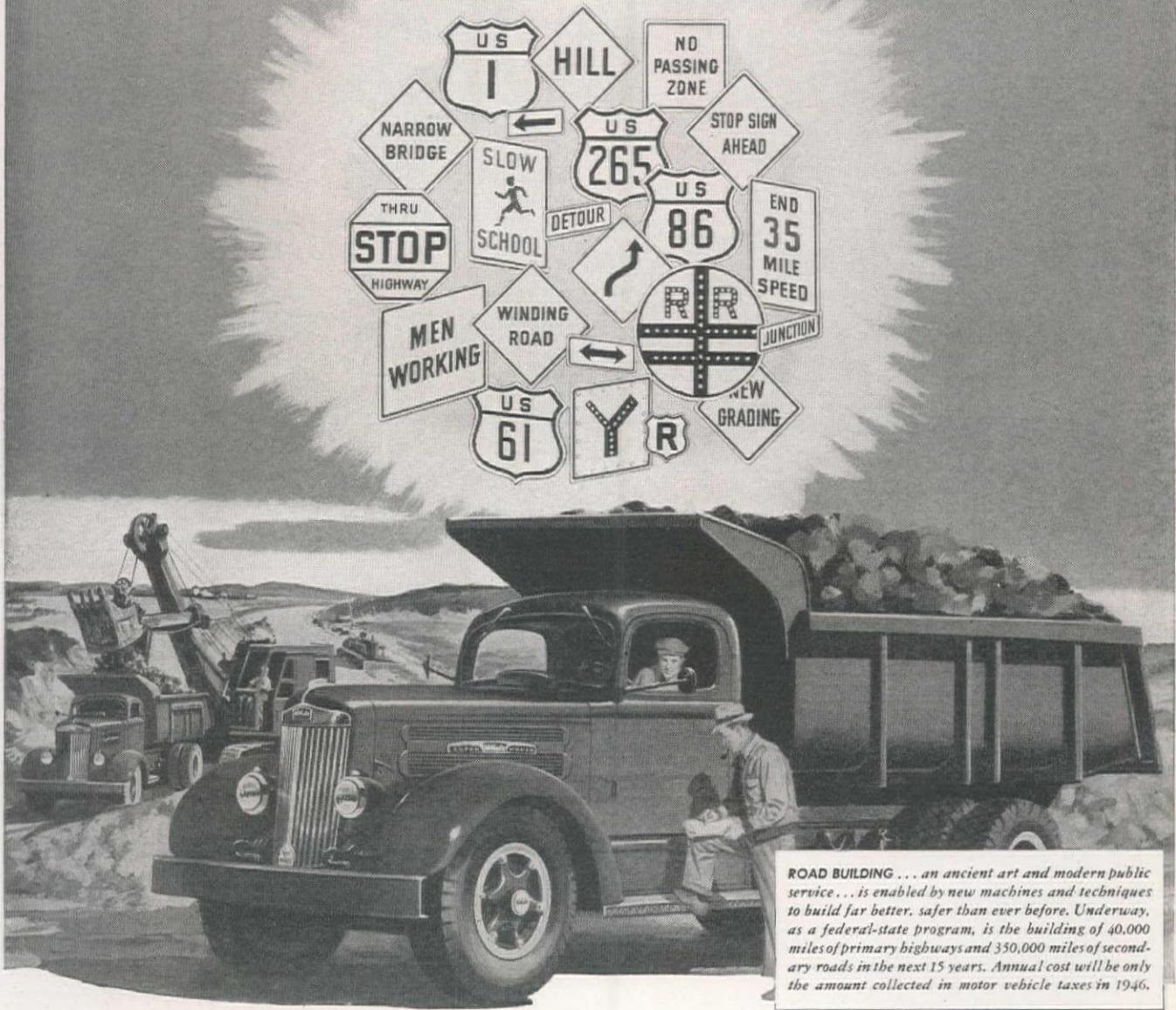


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Reading Time: *Split Second*



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THE SIGN LANGUAGE of highway safety is the world's fastest reading. It helps to make our modern high-speed highways safe, easy-to-follow, across the nation. This year, federal, state and local governments, working in cooperation with the American road building industry, will build \$1 1/2-billion worth of new construction—with

safety and year 'round use paramount in their plans.

As even before the start of the historic "Good Roads Movement" after World War I, Whites are preferred in road building and maintenance service. Correctly selected for the work they do, properly maintained and skilfully manned, Super

Power Whites are as modern and as efficient as a "clover leaf" traffic intersection. They enable their owners to control costs with scientific accuracy. The same applies to every truck-using business, as your White Representative will be glad to explain to you.

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FOR MORE THAN 45 YEARS THE GREATEST NAME IN TRUCKS



ON THE ROAD.. AND ON THE JOB

You'll be Out Ahead

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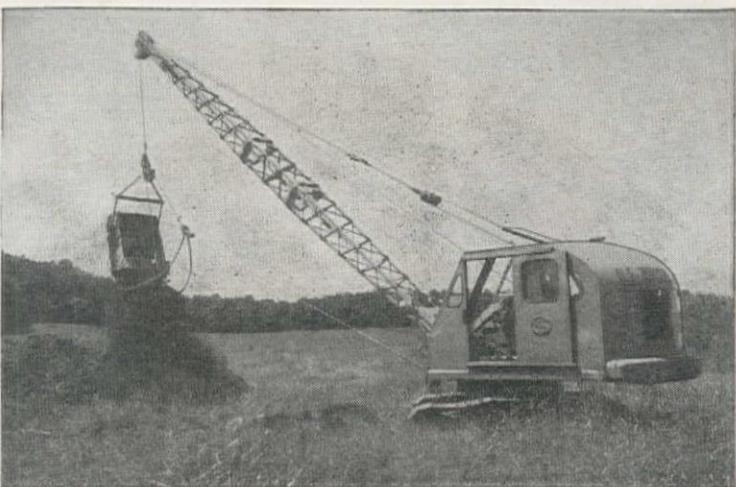


MODEL T6K — $\frac{3}{8}$ Yd., 6-Ton

Michigan rubber tired truck shovels are famous for speed on the road and on the job. Designed as a unit, with a heavy frame built for the job. Plenty of power gives you 30 mph road speeds. Easy operating air valves control air ram clutches for speedy crowding, hoisting and a 5.5 rpm swing that means extra yardage.



MODEL TMDT-16 — $\frac{1}{2}$ Yd., 10-Ton



MODEL C-16 — $\frac{1}{2}$ Yd., 8-Ton

For those swampy jobs the model C-16 — balanced weight distribution — wide pads — low ground pressure — air controlled mechanism, travel and steering.



MODEL TLDT-20 — $\frac{1}{2}$ Yd., 12-Ton

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MICHIGAN POWER SHOVEL COMPANY

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Davey Valves Assure PERMANENT PEAK EFFICIENCY

Any compressor will run perfectly when it is new... and will produce its rated air capacity.

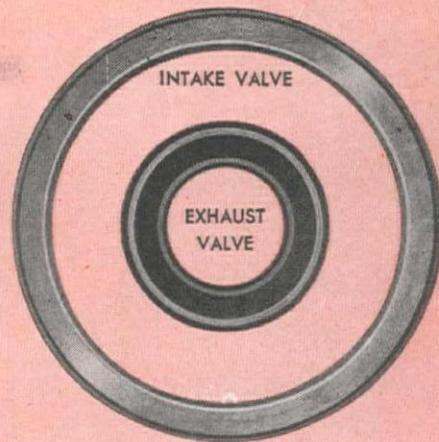
The real test of quality comes with increasing age... the manner in which a unit operates after 5-10-15 years of service. This depends 100% on valve efficiency.

In Davey Compressors permanent peak valve efficiency is the result of providing a ready path for heat removal through aluminum alloys. These alloys transmit heat through their mass three times as fast as cast iron.

Consequently, Davey units operate at constant peak efficiency—longer and more economically.

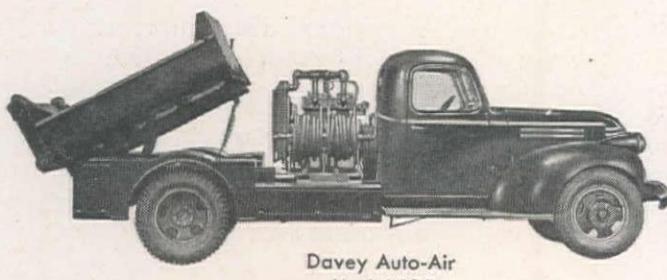
Davey is your best compressor investment—both for today and tomorrow. See your Davey dealer now. Ask him to tell you more about Davey valves—also, how vibration has been "engineered out" of the Davey line for '47.

P & P-115



AFTER 13 YEARS of continuous service, these valves were recently removed from a Davey Compressor.* Their peak-efficiency condition is attested by the absence of carbon or pitting. Note how they have obviously seated perfectly—the complete absence of any signs of leakage . . . after 13 years.

*Owner's name on request.



Davey Auto-Air
Model 105

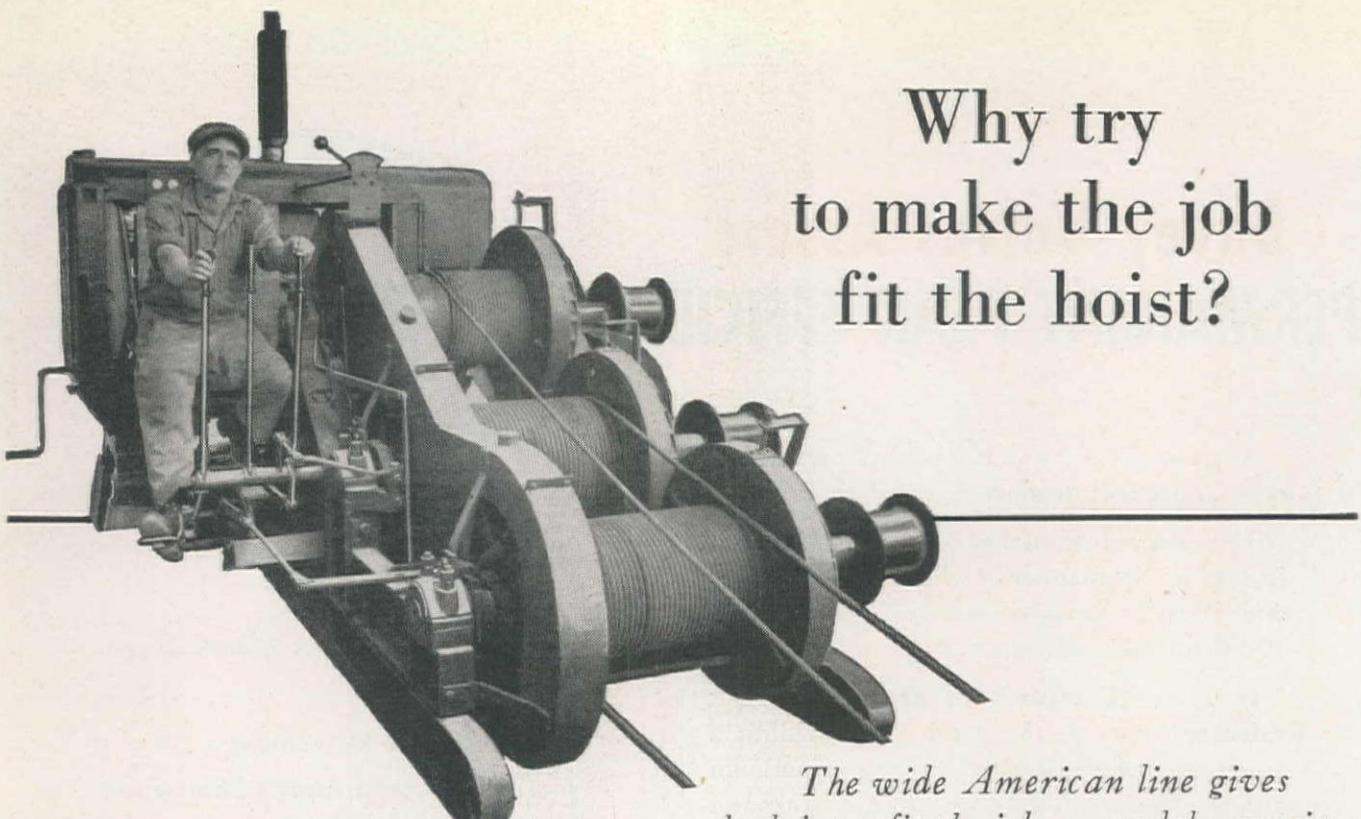


Davey Air Chief
Model 210

DAVEY

DAVEY COMPRESSOR CO.
KENT, OHIO

Why try to make the job fit the hoist?



*The wide American line gives
you the hoist to fit the job . . . models ranging
from 500 to 40,000 pounds single line pull*

During 60 years of hoist building, "AMERICAN HOIST" has constantly expanded its line.

Today we can offer you any desired degree of power, from 500 lbs. to 40,000 lbs. single line pull. From the small roofer's hoists on up to the great Model 400, this line gives you precisely what you need for any job, any set up, any budget. On most sizes, you have your choice of three kinds of power—gasoline, electric or diesel. Steam models are also available.

For the great majority of construction jobs, you'll want one of the five AMERICAN General Purpose Hoists.

Capacities are from 2,500 to 10,000 lbs. single line pull.

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OF MODELS
TO
CHOOSE
FROM

They're light, rugged and speedy . . .
easy to use; easy to service.

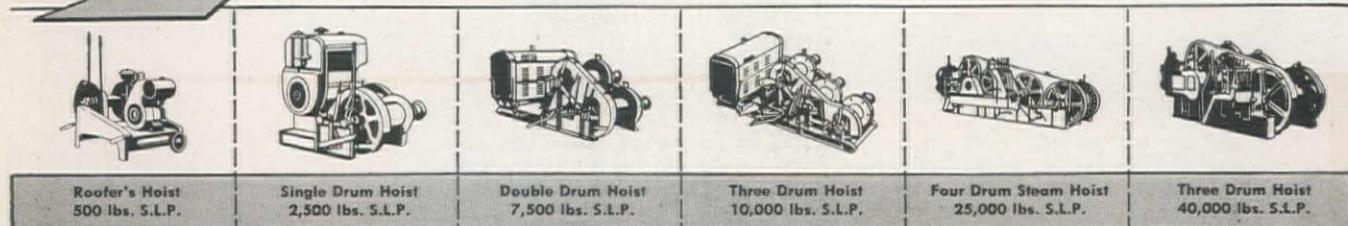
... and DERRICKS to match!

When it's a hoist-and-derrick job, you should have matched units. The "AMERICAN" line meets all derrick needs: Stiffleg, Guy, Gallows Frame, Steel Erector, Barge and special types . . . the most dependable strength you can buy.

Ask your "AMERICAN" distributor, or write us direct, for helpful information on any job.

Product of
American Hoist
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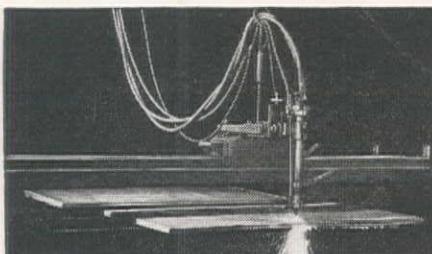
"Tailored steel" becomes a regular steel warehouse commodity when an OXWELD shape-cutting machine is used.



LINDE process service cuts production corners

You may be taking advantage of all of the more apparent economies of LINDE methods. Yet, through the broad and comprehensive experience of the LINDE service organization, important additional savings may be made.

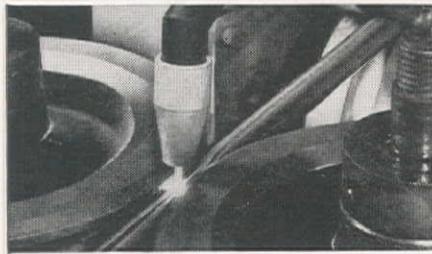
LINDE Process Service is available to all LINDE customers through any LINDE office.



Stainless steel plate, difficult to oxygen-cut by usual methods, can be quickly cut to size and shape by powder-cutting.



Scrubbing steel with a brush of flame removes scale, rust, and surface moisture prior to painting. This is flame-priming, a LINDE development.



HELIARC welding makes strong, clean welds in stainless steel tubing because the weld zone is protected from oxidation by a protecting envelope of argon or helium gas.



The design of a simple jig for centering cold rounds—or the design of a completely mechanized flame-conditioning installation—are examples of LINDE Process Service.

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40 years of engineering know-how is at your disposal. Consult **TELSMITH** Engineers.



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Waupaca Sand & Gravel Co. plant, Custer, Wis., owned and operated by F. F. Mengel Co.

NEW MEXICO

Sharpe & Fellows Contracting Co. of Los Angeles, Calif., quarry plant near Albuquerque.

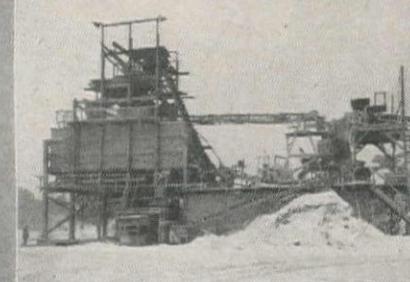
WASHINGTON

Alongside the Columbia River . . . crushing and washing plant of Howard Smith, Vancouver, Wash.



NEW YORK

Quarry plant of Abraham Cleason, Sodus, N. Y., is effectively serving its expanding market.



VIRGINIA

Arlington Stone Co., Leesburg, Va., produces crushed trap rock in 5 sizes to bituminous surfacing specifications.

OHIO

Camp Dennison, Ohio, all-Telsmith plant, one of six large plants of the Ohio Gravel Co., Cincinnati.



TENNESSEE

TVA's Watauga Dam aggregate plant is using four different types of Telsmith Crushers.



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MP-6



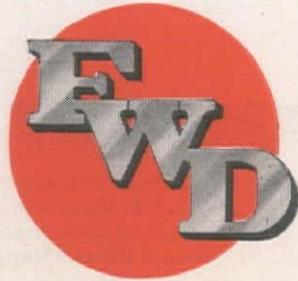
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Keeping mixers on the move between central mixing plants and pouring points, speeds operations — makes more money for you. So does a mixer that has FWD four-wheel-drive power and traction to maneuver fast and safely on the job — even when it's off the road, over rough ground of construction sites.

Mount your mixers on FWD four-wheel-drive trucks and you have what it takes to keep going — up and over steep grades, through loose sand or sticky gumbo, over rough and rocky ground, working on or off the road. You speed all operations — you get more work done, more profitably — with mixers mounted on FWDs.

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Clintonville, Wisconsin
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100,000-gal. HORTON ELEVATED TANK

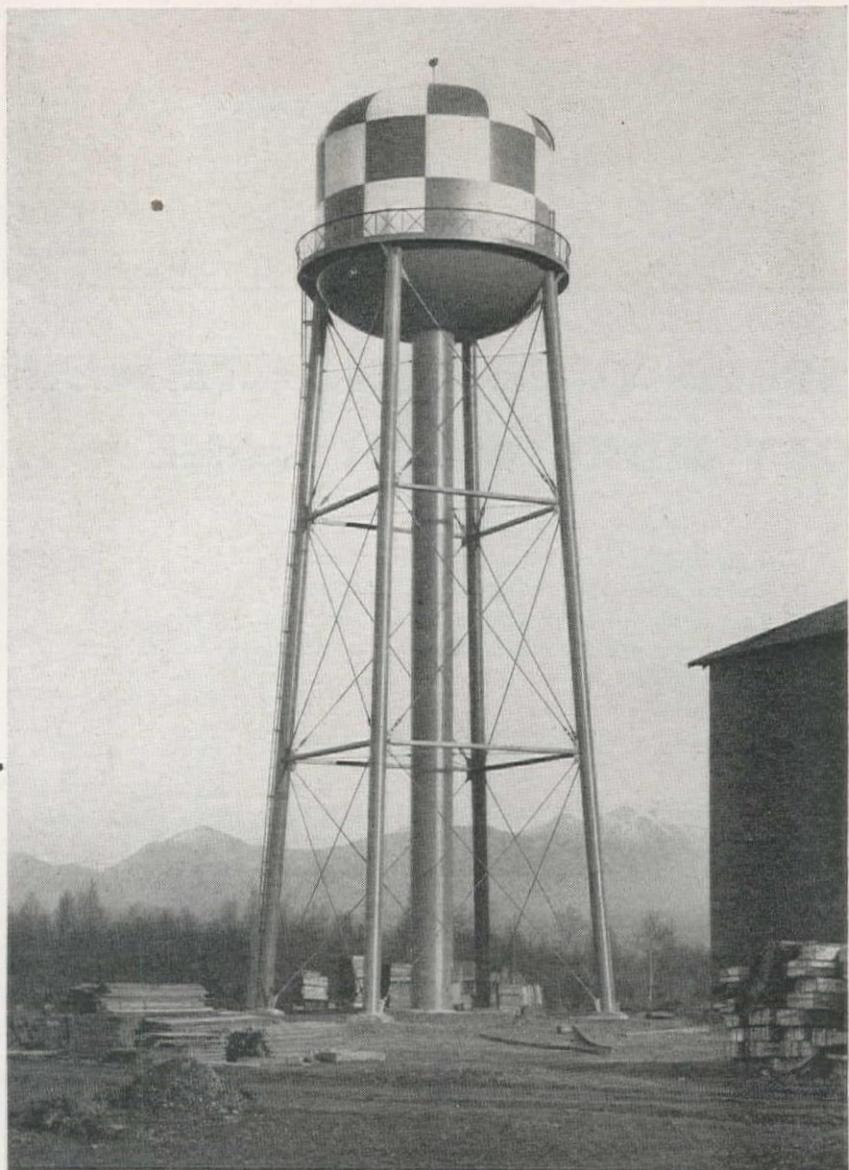
*provides dual service
for The Alaska Railroad*

A rehabilitation program now in progress, will enable The Alaska Railroad to give the people of that Territory year 'round, modern service. The 100,000-gal. Horton elevated tank shown at the right was erected as a part of this program. It is located at Anchorage and supplies water for the new railroad employee housing project in that city. The tank also provides a dependable supply of water under gravity pressure for fire protection. It is 82 ft. to bottom.

The main line of The Alaska Railroad runs from Whittier and Seward on the Pacific Coast to Fairbanks, Alaska, a distance of 470 miles. Principal materials handled by the railroad include coal, lumber and ore.

Horton welded ellipsoidal-bottom elevated tanks, like the one we built for The Alaska Railroad, have a relatively large diameter and shallow depth. This gives the structures pleasing proportions and also reduces the variation in pressure as water is drawn from the tank. The central riser is welded directly to the tank bottom. There is no expansion joint to require inspection or packing.

Horton tanks are used for both municipal and industrial service. They are built in a complete range of standard capacities from 10,000 to 2,000,000 gals.



When figuring on jobs that require elevated water storage, get estimating figures on Horton elevated tanks.

CHICAGO BRIDGE & IRON COMPANY

Los Angeles 14.....	1444 Wm. Fox Bldg.	Cleveland 15.....	Guildhall Bldg.	Birmingham 1.....	1598 North Fiftieth St.
San Francisco 11....	1213-22 Battery Street Bldg.	Detroit 26.....	Lafayette Bldg.	Atlanta 3.....	2183 Healey Bldg.
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Plants in BIRMINGHAM, CHICAGO, and GREENVILLE, PA.

In Canada—HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED

WESTERN HIGHWAYS BUILDER

March, 1948

Vol. 23, No. 3

J. M. SERVER, JR. Editor
D. F. STEVENS Associate Editor
ARNOLD KRUCKMAN Associate Editor

Take 'Em Around

CHEYENNE, WYO., is experiencing the silly disturbance that always recurs when a highway department tries to take a forward step in expediting traffic, reducing congestion, and promoting automobile and pedestrian safety.

The opposition here, as in all similar cases, is based on a discredited theory that automobiles should be slowed up in passing through a congested area.

The viewpoint of modern traffic planners is that traffic should be kept moving steadily, at the fastest speed consistent with safe operation. Frequent stop signals, heavy cross traffic, downtown pedestrian crossings and interruptions to traffic flow by autoists backing into or out of parking spaces, are now regarded as hazards to be avoided or minimized in the handling of auto traffic.

The principal objectors, of course, are always merchants who feel they will lose a certain amount of tourist business if through traffic is routed around the shopping area. They are, of course, wrong, in the light of their total business. The foundation of the merchant's business is always the resident of his own town, and any program which makes it more difficult for that level of customer to reach his store, or that upsets the customer's mental equilibrium by increasing driving and parking problems, is short-sighted indeed.

If the through driver needs aspirin, he'll leave the highway to go to a drug store; if it's meal time, he'll come down town; if he wishes to stop overnight, he'll hunt up a hotel or auto court; if he wants to send a telegram, or look up a friend, or buy a lollipop, he'll go into town to do it. If, however, he desires only to get to his destination a thousand miles beyond, routing him through the business district will only cause resentment in his heart toward that city.

A through route, a freeway if possible, around the populated centers is the modern, the most efficient, the safest, and the best way to handle this problem.

Public Relations Flop

PACIFIC GAS & ELECTRIC CO., power supplier for a great portion of central and northern California, has just embarked on one of the most stupid public relations programs it has ever been our misfortune to see.

A near-disastrous drought is currently affecting the area the company serves. Not only are the water resources from which much of its energy is manufactured greatly reduced, but farmers, short of water, are tremendously increasing their power demands for pumping purposes. The power resources are being attacked from both ends. So quite rightly, the company is seeking every possible means to conserve power. No one can object to that, and *Western Construction News* strongly supports it.

But this great company, now engaged in a life and death struggle with the federal Bureau of Reclamation, whose ideologist leaders take every means of hampering its operations, (and we believe seek ultimately to destroy all private electric distribution companies, as in the Tennessee Valley Authority,) adopted as its first conservation move the one method best calculated to disrupt the life of the average citizen, whose support and sympathy above all others, the utility needs to husband. The company, as its first move, reduced its generator speeds so that the cycle count dropped from the standard 60 to 59½ per second.

To achieve a very doubtful saving, every electric clock,

public or home, every automatically timed valve or regulating device, is slowed down. In many houses today, electric clocks are the only time instrument. Every electric clock in all northern California is now inaccurate, by many minutes per day. Every citizen who misses a train or an appointment or an hour's sleep through this action of the power company can only curse those who so high-handedly interfere with his private life.

Presumably the company wished to emphasize the problem to its customers, but people in such a frame of mind are the best possible potential converts to the smooth-talking advocates of federal power. P. G. & E.'s program is of little value as a power economy measure, and a suicidally stupid action from the standpoint of its own future and the free enterprise system in all the area it serves.

What Happened Here?

MATILIJJA DAM has been accepted from the contractors by the Ventura County (Calif.) Flood Control District. It stands today in its canyon on what may be an unsafe foundation. Although \$2,200,000 and possibly more has been spent for a project which was originally estimated to cost about \$700,000, the State Division of Water Resources has refused to permit storage of water above elev. 1025, at which point only about 250 ac. ft. may be stored. Eminent engineers and geologists who have visited the site maintain that "we cannot take the risk of letting leakage develop (through a 'mushy and fractured' foundation). And we cannot let the dam stand without improvement."

Certainly *Western Construction News* does not charge that the dam is unsafe, or that the lives and property of 4,000 people who live below it would be endangered if it were filled. We published an article on the design of the structure in August, 1946, and on the construction in April, 1947. Although since that time we've been accumulating a really voluminous file of clippings and opinions on the dam, we have studiously refrained from any comment.

These people have had principal parts in the job: The Ventura County Board of Supervisors, who of course are not technical men; Robert Ryan, County Engineer, who returned to the county from the service after the project had been initiated; the Donald R. Warren Co. of Los Angeles, who conducted the preliminary studies, designed the dam, and supervised construction; the State Division of Water Resources, Edward Hyatt, Chief, and W. H. Holmes, Supervisor of Dams, which approved construction; Atkinson-Kier-Bressi Bevanda, the joint venture contracting firm, who built the dam, meeting all the requirements of the engineer, according to his testimony, and from whom the county has accepted the structure, signifying satisfaction with the workmanship; Dr. Charles P. Berkey of Columbia University, one of the nation's outstanding geologists, called in by the county after construction had commenced; A. W. Simonds, grouting expert of the Bureau of Reclamation, consulted when the dam was near completion; Dr. Thomas L. Bailey, another consulting geologist; M. Arthur Waite, District Attorney of Ventura County; S. V. Pritchard, attorney representing the grand jury in its investigation; and the employees and associates of the above.

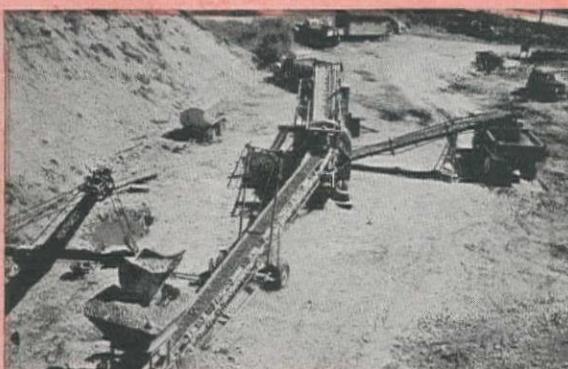
If any of these, or others not named above, are guilty of negligence or misrepresentation on the project, it should be brought to light. If not, they should be completely cleared of any blame. We make no charges against anyone, but we are asking a lot of questions around, and will perhaps be able to publish some answers one of these days. Meanwhile we urge the American Society of Civil Engineers to conduct a thorough investigation in the interest of protecting the integrity of the profession.

Making Little Ones Out of Big Ones

WITH A-W PORTABLE PLANTS



Two-Unit Portable Crushing and Screening Plant.



"101" Portable Crushing and Screening Plant.



"81" Portable Crushing and Screening Plant

Austin-Western Portable Crushing and Screening Plants are built in sizes and types to fit every production requirement.

Under certain conditions, Multiple-Unit Plants are recommended because of greater operating flexibility and lighter transport weight. These Two- and Three-Unit Plants are primarily suited for producing large quantities of material, and if desired, several sizes may be produced at one time.

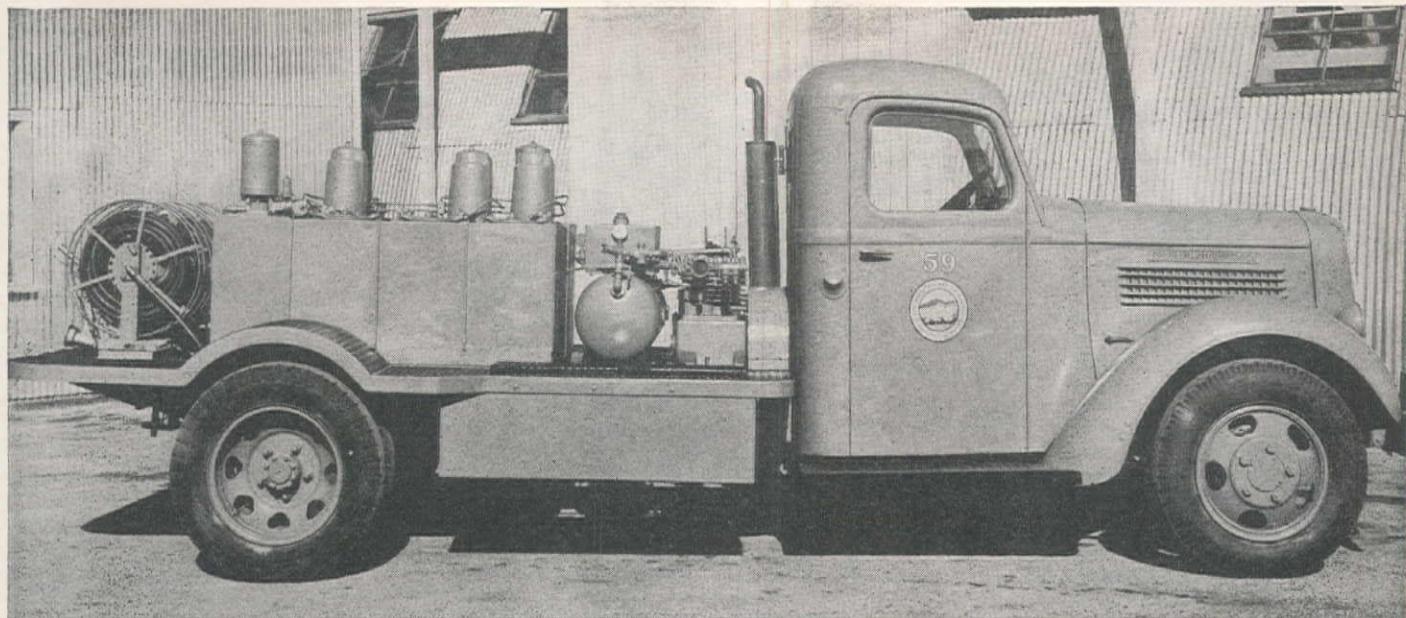
Shown at the left are two of many Single-Unit Plants—the "101" with its 10 x 36 Jaw Crusher and 30 x 18 Roll Crusher, and the "81" with its 10 x 36 Jaw Crusher.

All Plants are equipped with matched Screens and Conveyors, correctly balanced to deliver the maximum amount of crushed and screened aggregate in controlled sizes. From the smallest Single-Plant—and there are many smaller than those pictured on this page—to the magnificent Two- and Three-Unit combinations, every Austin-Western Portable Plant is "engineered for low-cost tonnage."

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

ARIZONA—SMITH BOOTH USHER COMPANY.....Phoenix
CALIFORNIA—EDWARD R. BACON COMPANY.....San Francisco 10
CALIFORNIA—SMITH BOOTH USHER COMPANY.....Los Angeles 54
COLORADO—LIBERTY TRUCKS & PARTS COMPANY.....Denver 1
IDAHO—COLUMBIA EQUIPMENT COMPANY.....Boise
MONTANA—WESTERN CONSTRUCTION EQUIPMENT CO.....Billings
WYOMING—WILSON EQUIPMENT & SUPPLY COMPANY.....Cheyenne

MONTANA—WESTERN CONSTRUCTION EQUIPMENT CO.....Missoula
NEVADA—C. D. ROEDER EQUIPMENT COMPANY.....Reno
NEW MEXICO—N. C. RIBBLE COMPANY.....Albuquerque
OREGON—COLUMBIA EQUIPMENT COMPANY.....Portland 14
UTAH—WESTERN MACHINERY COMPANY.....Salt Lake City 13
WASHINGTON—COLUMBIA EQUIPMENT COMPANY.....Seattle



COMPACT and mobile lubrication truck, designed and built almost entirely by the garage mechanics, carries a payload of 250 gal., drives everywhere in the county.

Design Originality— Road Garage Builds Super Equipment

Mechanics at the San Mateo County garage in California rebuild their road equipment and shop tools for increased efficiency — Mobile grease truck, bituminous oil trailers, heavy equipment trailer, and improvised shop crane are some of the items with the "new look"

REPAIR and maintenance is effected with enthusiasm and ingenuity at the San Mateo County garage and repair shop in California. Unusual equipment innovations improve the working characteristics of most of the department's equipment and a system of preventive maintenance keeps the equipment in excellent working shape to further increase the efficiency of the units under the department's supervision.

A quick look around at even the equipment temporarily in the garage yards for repair or maintenance reveals that there is hardly one piece of equipment purchased by the department that has not been changed, rebuilt or improved in some way. As George Miller, the shop superintendent states, "Even before we have a new piece of equipment on the grounds, we are already figuring out just how we are going to rebuild it." Some of the innovations are so practically simple, yet ingenious, that it is hard to realize

that the equipment was not made that way originally.

Bituminous oil trailers

It is hard to determine which piece of equipment rebuilt by the mechanics at the San Mateo garage could be named the most unique and worthy of special description. Probably the oil trailers being used by the department constitute the outstanding example of how the crew created an entirely new unit at low cost to fulfill a highly practical need.

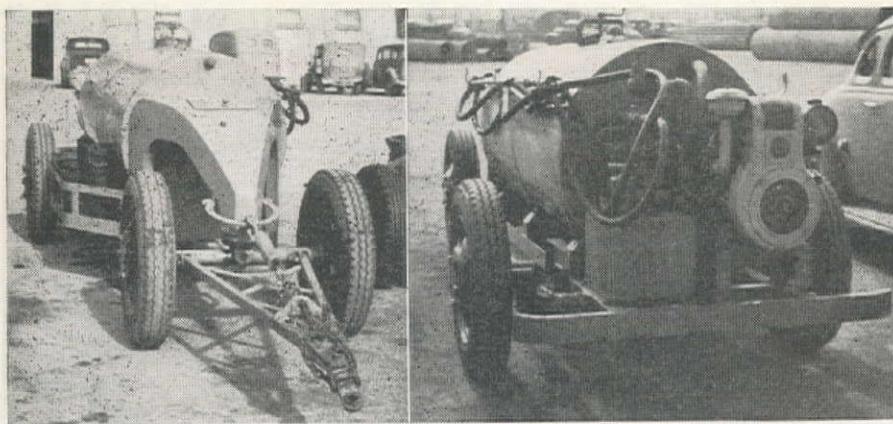
The department has a number of three-wheeled and four-wheeled trailers carrying a single tank of bituminous and emulsifying oils used to patch and repair roads. These trailers were built and fabricated in the repair shop with parts and materials coming from an astonishing variety of sources and incorporating unique ideas which resulted from the combined ingenuity of the crew of mechanics.

The frame of the oil trailers is built up

of angle and channel irons formed in the shop and welded together into a sturdy unit to support the weight of the tank, oil, motor and pump. The front wheels and axle assembly are from a 1½-ton Ford truck. To adapt this assembly for the trailer use, the mechanics cut the king pin bosses off up to the backing plate flanges, and the front spindles were bolted to tubing between the wheels, using the original bolt holes in the flanges. The axle was thus shortened considerably, compactness attained and future replacements can be easily made.

The rear axle is built using wheels from another Ford truck, the rear springs from a GMC truck, and other parts devised and built in the shop. The axle is offset, that is, right angle turns downward, built on the inside of each of the backplates, lower the carrying level of the rear axle a foot below the center of the rear wheels. This was incorporated for a number of reasons. The oil tank sits lower on the frame and is easier to work with, and a lower center of gravity makes the entire unit more stable.

A hydraulic brake with hand lever is built into the rear assembly to keep the trailer from rolling when it is unhitched. Originally, a ratchet and pawl mechanism caught the brake handle in a number of positions to vary the braking force, but the mechanics decided that operators who pulled the brake lever on might happen to pull it only part way



BITUMINOUS OIL TRAILERS, fabricated in the repair shop with parts coming from an astonishing variety of sources, have offset, low-slung frames, snubbing device on tongue to allow for turning of front wheels, and no-leak plugs for filler holes.

into play, and then, forgetting that the brake was on, drive away and burn out the brakes. So they simply cut out the intervening teeth, leaving only the last tooth which engaged the brake in full force. Now, either the brake is all the way on or all of the way off, and it has been a long time since the brake linings on any of the trailers have burned out.

Engine and pump

A small 5 h.p. gasoline engine with a reduction case is mounted to the rear of the oil tank and powers the pump by a belt drive. The pump enters the tank at the lower rear and is kept in place by a steel plate fitted around the pump and bolted to the tank.

The gasoline engine once had an exhaust which discharged into thin air above the engine, but not for long. Often, in the experience of the repair crew, the oil directly in the vicinity of the pump became too thick when it was cold and clogged up working parts and pipes with its increased viscosity and tendency to form layers of scum. So they lengthened the exhaust pipe, ran it into the tank near the pump and consecutively through four turns of copper tubing placed around the pump so that the final exhaust was beneath the rear axle. Thus, the heat which had been escaping from the exhaust was effectively used to warm the oil around the pump to keep it flowing freely.

The gooseneck of the trailer is built up with 4-in. I-beams, covered with solid sheet steel plating for a neat appearance. A box is built into the hollow space inside the gooseneck as a handy place for carrying rags and tools.

The A-frame tongue, fabricated from channel iron bars and steel struts and with a universal joint, is built so that it turns either right or left and also up and down without changing the balanced position of the frame and tank assembly. A tube, which might be called a spring loaded or snubbing device, was built on rods between the gooseneck joint and the universal hitch to hold the tongue away from the ground so that it could be easily hitched to the hauling truck. A ring built into the gooseneck allows the snubbing device to slide freely around as the entire tongue is swiveled so that sharp turns do not pull

the hitch up. If this had been constructed so that it rotated on a fixed pin, for instance, a great amount of stress at the hitch would have resulted when sharp turns were maneuvered.

Special filler hole plug

At the filler hole on top of the tank, the plug is no longer of the screw-in type. The crew found that the oil gathered in the threads, allowed seepage out of the tank and sometimes made it harder to loosen the plug when it was in place. A tapered cone plug was devised to remedy this inconvenience. With this idea, the cap drops easily into the reverse tapered opening, and a screw clamp built over the cap presses it tightly into place with two turns of a lever. There is no seepage around this type plug.

The built-in measuring stick incorporates this same principle. The stick, calibrated in 25-gal. divisions, is used to keep close track of the amount of oil used for each job which the trailer attends. A pipe and baffle to replace the breather in the top of the tank also stopped the seepage from that point.

The three-wheeled oil trailers have the single wheel in the front and this

wheel is raised and lowered by a large wheel and screw. This wheel is lowered before the pin at the universal joint is removed to detach the trailer from the truck.

Heavy equipment trailer

A huge trailer-truck which carries up to 35 tons and easily handles and hauls all of the heavy equipment owned by the department was rebuilt with many innovations. Originally, the trailer had wheels in front and back and was adapted for use with a truck and hitch. Difficulties were experienced since the trailer weaved when it was carrying a heavy load and was hard to control.

So the crew rebuilt the entire trailer to fit their own specifications and needs. They removed the front wheels entirely and substituted a huge, built-up gooseneck. Then they removed the dump body from a dump truck and built the fifth wheel to accommodate the gooseneck on the rear chassis of the dump truck. The frame, gooseneck and fifth wheel were all built in their entirety in the shop.

A winch with wire rope cable was built just to the rear of the truck cab to pull the heavy equipment on to the trailer and a ramp which could be lowered easily was placed on the rear of the trailer. A power take-off from the truck transmission was installed to power the winch.

Two separate swivel axles were built for the wheels at the rear of the trailer, and these were built with hydraulic pistons which allow the axles to rotate independently sideways and up and down so that the trailer could be hauled over rough terrain.

The entire bed of the trailer was rebuilt so that it rests two feet lower than originally and heavy loads ride lower with a more stable center of gravity. Equipment moving in San Mateo County is no problem now. This trailer does not weave on the road, equipment is loaded and unloaded rapidly with a minimum of manpower, and the built-up unit carries the heaviest cats and shovels.

HEAVY EQUIPMENT trailer was rebuilt with huge gooseneck resting on fifth wheel built into the chassis of what used to be a dump truck. Entire bed of the trailer was lowered 2 ft. for low center of gravity, and winch installed for easy loading.



Unique grease truck

A compact and mobile lubrication and grease truck simplifies the maintenance work on the department's 90 pieces of equipment. This unit drives everywhere in the county and services equipment on the job with no loss of working time.

Briefly, this unit consists of five tanks for motor oils and greases built on the deck of a 1½-ton flat-bed truck with an air compressor to power the pumps, and hoses and reels for dispensing the lube oil or grease from each tank.

The department had previously been using a small gasoline engine to drive the air compressor, but they found that too often the engine had to be coaxed into starting and generally was not dependable. So the crew decided to install a power take-off from the truck transmission in its stead. Now, the compressor may be operated at will by shifting the truck engine power from the transmission through the power take-off to the compressor, which is mounted to the rear of the truck cab.

The compressor and receiver is a 20 cu. ft. displacement unit and develops 15 lb. of pressure. A regulator is used to adjust the desired air pressure, which is adequate to drive the pumps and service the tires on all heavy equipment.

The five tanks and Alemite power pump are mounted compactly in the center of the truck deck with the hose reels mounted in the rear. The air service hose and reel are mounted on the driver's side of the cab next to the compressor. Around this an 18-in. cat-walk was built, a practical innovation for the convenience and safety of the operator. The non-skid diamond plate used for the surface of the cat-walk insures against slipping. The cat-walk all the way around the truck is only 33 in. from the ground.

Payload capacity

The payload capacity of the lubrication unit is 72 gal. of motor oil, 48 gal. of Diesel engine lube, and 40 gal. or 300 lb. each of gear lube, track roller and chassis lubricants.

These lubricants are dispensed by their respective power pumps to the service reels through hose leads of 30 to 40 ft. in length with control valves of the type suitable for the service to be performed. Lubricants are replenished by means of air operated transfer pumps mounted into the original lubricant drums and the lubricants are pumped into the tanks on the truck with no loss or contamination.

To make the heavy-duty motor oil pumps conform in height with the other pumps, the mechanics lowered these two pumps. They did this by cutting into the top of the tank, dropping the pump so that it projected 6 in. inside of the tank, and then fitting a steel plate, bolted around the pump at the top of the tank, to hold it securely in place.

Tool boxes were built into the cat-walk along both sides of the truck in front of the rear wheels. The boxes are formed of sheet steel, formed and welded in the shop and welded and bolted into place. In fact, the entire bed of the truck was rebuilt to accommodate the lubricating equipment. The sheet

steel makes the unit sturdy and dependable and an all-over paint job makes it neat appearing.

Schedule for grease jobs

All-over grease jobs using the truck are done at noon so that no working time for the equipment needing service is lost. When the equipment is idle for a long enough period, the grease truck is also used. A system of records is kept of the servicing done and that needed on each piece of equipment. In this way, the operator of the grease truck knows the service status and needs of every piece in the field or in the corporation yard.

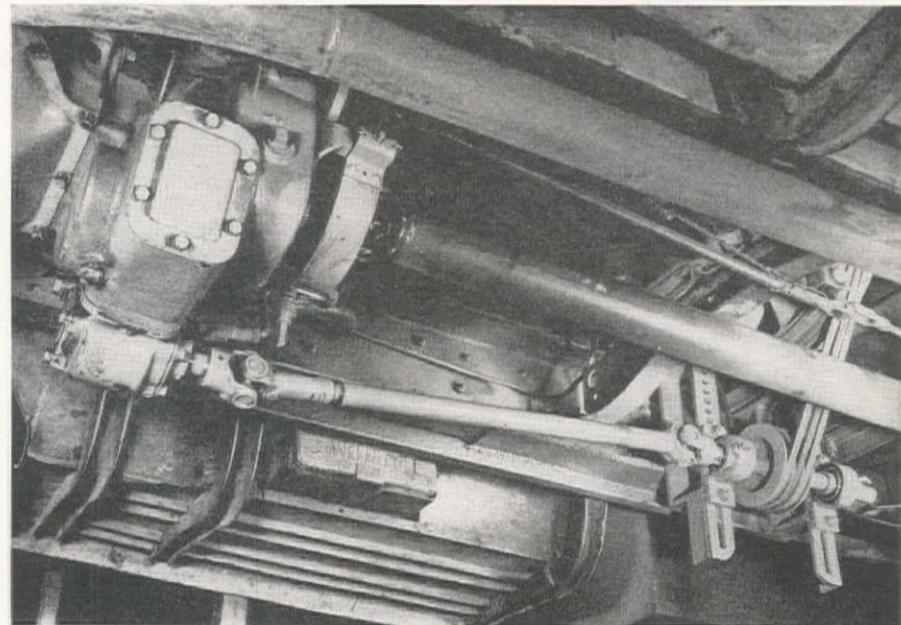
This system places one man in charge of all the servicing. Formerly, the operator of each machine had the responsibility for his machine's care, and too

often the servicing was postponed or neglected. With the new system in use here, equipment is serviced regularly and adequately.

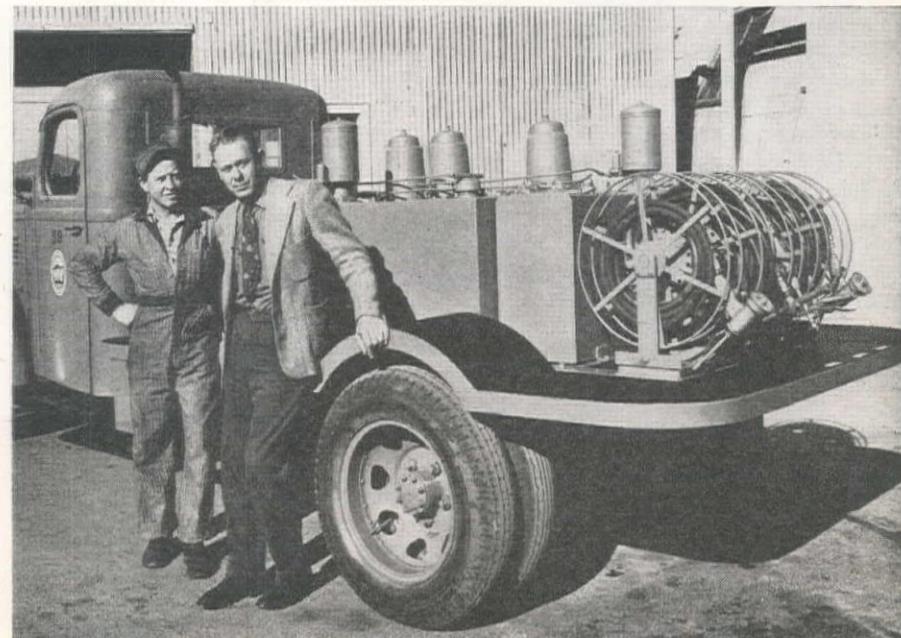
Improvised shop crane

Equipment inside the shop has also been improved by makeshift, but sufficiently adequate, devices and materials. A crane with a swinging boom was built using the gear circle from a Northwest shovel as the turntable. A small, ½ h.p. electric motor with triple belt drive turns the crane on this turntable. The gear box consists of an adapted gear box which was removed from an old pull grader, that is, the gear box used on the grader to lean the front wheels.

The crane boom is built up with 12-in. channel iron beams, and extends 25 ft.



POWER TAKE-OFF from the transmission of the grease truck, above, powers the air compressor to operate the pumps. It was installed to replace a gasoline engine unit. Standing beside the truck, below, are the two men mainly responsible for its creation. **RAY HAIL**, left, is head mechanic at the garage, and **GEORGE MILLER** is the shop superintendent. They give much credit, however, to the entire shop force.



to handle any of the heavy lifting required in the main part of the shop. The crew intends to install another small electric motor to operate the chain hoist as soon as time permits.

Automatic grindstone

To make work such as sharpening axes and tool edges easier, the crew located a 4-ft. diameter grinding wheel which they installed in the shop with a small electric motor as the turning power. They built up a frame around the wheel for safety and removed the water pump system from an old engine. The water pump, also powered by the electric motor from a belt drive, plays a steady stream of water on the grinding wheel.

Tandem roller trailer

The department had a two-wheeled trailer which was bought originally to carry small tandem rollers. There were too many things wrong with it for efficient operation. The A-frame tongue and tow-bar made it necessary to have the trailer unhitched from the truck while the roller was being loaded. Then when the roller was on the trailer, the coupling was weighed down to the ground by its imbalance and it required muscle and sweat to lift the tongue to insert the coupling pin.

First, the crew built another tongue, offset a foot above the original one, and then they built in a leg which held the tongue away from the ground approx-

imately at the correct height to align it with the coupling on the truck. To make sure the hitching would be exactly aligned under any conditions, they installed a wheel and screw adjusting mechanism to raise and lower the tongue with little effort. The leg was built so that it could be flipped up out of the way when the trailer was ready to roll and locked quickly into place in the up position.

On the trailer bed, they placed two angle irons longitudinally to guide the tandem as it was being loaded into position in the center of the trailer deck. Another angle iron built on top of the deck toward the front stops the tandem in a position where the trailer and roller are in near perfect balance. Now, one man can easily load or unload, and hitch or unhitch the trailer. A chain was built at the front to hold the roller in position. And the rocking bed of the trailer is locked in traveling position by bolts which clamp in quickly from both sides in the front.

Bulldozer built on scraper

Scrapers with bulldozers built in front of the leaning wheels are now being manufactured. But they were not being manufactured by any concern a few years ago when the crew decided to install a bulldozer on the front of each of their scrapers.

First, they built an 8-ft. dozer blade, rolled out of heavy sheet steel. Then, they extended steel tube arms from the

pivot point where the power control arms for the scarifier rotated. The blade was welded and bolted into place, supported by a frame built out to the front of the front axle where it could be raised and lowered by the arms acting in synchrony with the scarifier power control arms. It was constructed so that the scarifier was down while the dozer blade was up, and vice versa, so both parts would not be engaged in operation at the same time.

On the same scrapers, the tie rods for the front wheels often became bent and, just as often, had to be brought into the shop for costly repair and with lost working time. The crew built a guard of $\frac{1}{2}$ -in. steel plate which passed from beneath the front axle to encircle the tie rods. Enough radius was left to allow for the front and backward and up and down movement of the rods with the wheels in varying positions. The tie rods have not had to be bent back into place since the guard was installed. The crew claims that the innovation has saved a good margin of cost over the initial expense of the installation.

Other equipment

There are many other pieces of equipment which are equally unique. The department has an old 1915 White truck which they overhauled and equipped with a new V-8 engine and transmission. The oldster is now a valuable piece of equipment that faithfully carries a 900-gal. tank of water, and gives no more trouble than a new truck.

The hydraulic lift in the shop has been renovated to facilitate repair work. The lift is of the type where long I-beams support the rear axle to accommodate any size truck. When the lift was installed, the floor grooves with their cover flaps were changed so that hinges, flaps and all were perfectly flush with the lift in lowered position. With the lift down, the floor space is now available for moving even the heaviest equipment without injury to the lift floor covers. The mechanics also built two sliding standards to hold the axle of the truck away from the supporting I-beams so that access to all the bolts and connections near the axle would be simple.

Soap used in the shop's steam cleaner was obnoxious to the workers inside of the garage, so they decided to put that facility outside. Water and gas lines are piped to the plant which is now just outside the wall of the shop. The steam cleaning is done near the plant, and the water pipe again goes under ground to the wash rack just a short distance away.

Welding outfits, drill press and other equipment inside the shop have all been placed on rollers to increase their portability. The shop itself is nothing more than a 40 x 120-ft. Quonset, which has plenty of windows for adequate lighting and three large doors for easy moving of equipment in and out of the shop. Racks for steel, tools and parts are built and placed neatly to make everything

SERVICE AND INSPECTION chart is used at the garage to guarantee a complete check-up of each unit brought in for repair and is then filed as a service record.

PREVENTIVE MAINTENANCE SERVICE AND TECHNICAL INSPECTION

Vehicle No. _____ Mileage. _____ Date. _____

INSPECT UNITS LISTED BELOW AND ADJUST, TIGHTEN OR REPAIR IF NECESSARY

Steering System
Clutch Action and Pedal Clearance
Transmission, Gear Shift
Power Take Off
Universal Joints
Brakes
Leaks in Hyd. Brake System
Battery Mounting and Terminals
Leaks of Water, Oil or Gas
Tighten Body Bolts, Fenders & Run. Boards
Check Head Lights
Tighten Front and Rear U Bolts
Check for Loose Wheel Bearings
Tighten Rear Axle Flange Nuts
Body Hoist and Pump
Muffler and Tail Pipe
Radiator and Engine Support Mountings
Radiator Hose and Clamps
Tension of Fan Belt
Clean Fuel Sediment Bowl
Ignition Points
Starter and Generator
Valve Tappets
Spark Plugs, Clean and Adjust or Replace
Road Test, Test Brakes
Steering
Performance of Engine
Unnecessary Noises Throughout Vehicle
Wheel Alignment and Tires

MECHANIC'S SIGNATURE

handy and, at the same time, keep it out of the way. There is no junk laying around at this shop. When a broken or obsolete part is removed from some equipment, it isn't thrown in a corner. It is thrown away or sold for junk. The crew decided long ago that the time saved by having everything neat and handy more than compensated for the slight use they gained from old parts.

Garage yards

The department has a spacious yard covering about an area of one acre in which to park equipment and store materials. Along one side of the yard, a long, open-shed garage shelters equipment not in use. The carpenter has a shop all to himself in one corner of the yard.

In the approximate center of the yard, open bins for storing of loose materials were made by constructing 3½-ft. high reinforced concrete walls. The six bins contain the $\frac{1}{4}$ to $\frac{3}{4}$ -in. rock screenings and ready-mix asphalt for road repair work, and coarse base rock for filling up holes. Truck operators merely back up to these bins, and the trucks are quickly loaded by the use of a scoop shovel. There is no wastage with these partially enclosed bins.

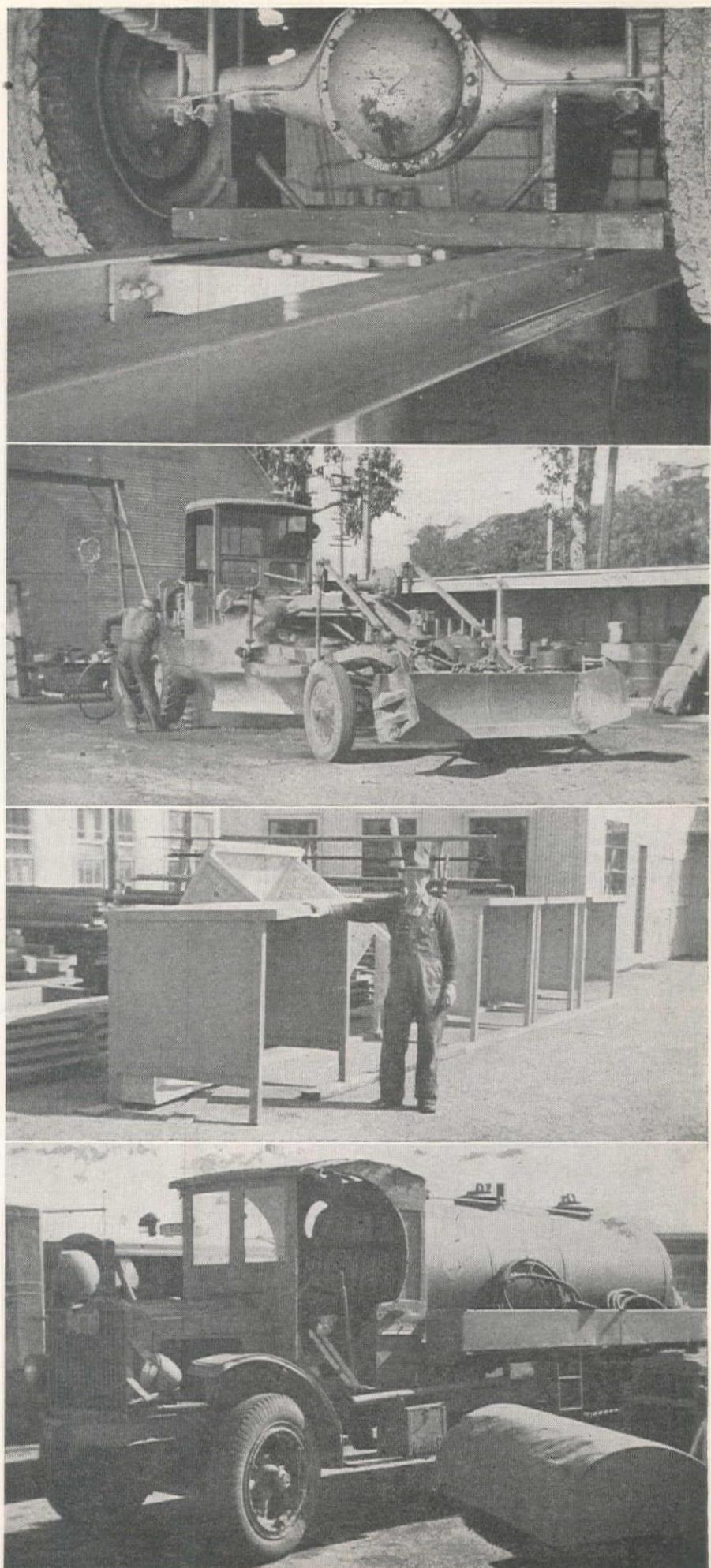
Department organization

The department was well organized and unified years before passage of the recent Burns-Collier act. Ernest R. Hoffman is road superintendent for the County, and George Miller is the maintenance shop superintendent. Miller, Ray Hail, the head mechanic, and Ray Stacey, blacksmith and welder, all mechanical "gadgeteers," are mainly responsible for the design and creation of the equipment improvements.

Although it might appear that the extensive improvements consume valuable time of the mechanics and are too costly to justify the time and expense, Miller and the crew claim that savings are actually the result. The program of preventive maintenance keeps all of the equipment operating when it is needed, and the innovations save time on a great number of individual jobs.

The department has made no actual survey to determine the savings made by its repair activities, but one thing is certain besides the fact that over-all expenses are surely not increased. Working conditions for the equipment operators and repair crews in San Mateo County are made immeasurably more pleasant, and all of the employees of the road department are proud of their jobs, their equipment and themselves. And, after all, that is an important factor in the pursuit of any occupation.

SLIDING STANDARDS, top, built to lift trucks above the supporting I-beams on the shop hydraulic lift, make bolts and connections easily accessible. Scraper with improvised bulldozer attachment, second from top, is steam-cleaned outside shop. Second from bottom, FRANK MEYER, carpenter superintendent, stands beside newly finished dog-houses, built to fit in the back of trucks as crew shelters. Right, 1915-model truck, equipped with new engine and transmission is now in faithful service.





Radical Re-Design for Conveyor Unit

MORRISON-KNUDSEN CO., Inc. has just completed the construction of Anderson Ranch Dam, the world's highest rolled earth-fill dam. It is a Bureau of Reclamation project on the south fork of the Boise River about 40 mi. southeast of the city of Boise, Idaho.

The dam is 456 ft. high from the bottom of the 200-ft. cutoff trench to the crest. It is 1,350 ft. long, with a crest width of 40 ft., and a toe width of 2,500 ft. About 8,800,000 cu. yd. of rolled earthfill and rock are included in the structure.

Material for the fill was excavated from borrow pits about 1½ mi. from the dam and was transported to the dam site on belt conveyors totaling 8,000 ft. in length, which was divided into six different flights. A pendulum type loading conveyor was used to load the fixed field conveyor at the borrow pit. It became necessary during the operation of this pendulum, moved in from a previous contract, to radically re-design the pendulum and loading hopper to handle the silty clay material involved without clogging up. The new machine was designed and built as an all-welded structure.

Pendulum design

The hopper and belt conveyor leading

Pendulum type loading conveyor at Anderson Ranch Dam, world's highest earth-fill dam in Idaho, was re-designed to handle large volume of silty clay

By GLENN L. ENKE

District Engineer,
Morrison-Knudsen Co., Inc.,
Boise, Idaho

from the point of excavation to a discharge onto the borrow pit field belt consisted essentially of a 150-ft. length of 60-in. belt conveyor supported within a steel truss resting upon mobile equipment at each end. Operation of the machine was accomplished by placing the discharge end of the pendulum, mounted on crawler-tractor track, over the 42-in. field belt running through the middle of the borrow pit and terminating ultimately at the dam site. The hopper or feeding end of the pendulum supported a manganese pan feeder and chopping roll which produced a uniform feed of earth at a maximum production rate of 1,600 tons per hour. Movement of the discharge end of the pendulum was effected by electric motors, driving through gear reduction units to each

crawler track to walk this end of the machine above and parallel to the field belt. The hopper end of the mechanism was so attached as to be held in line with the pendulum truss, yet flexible enough to allow wide variation in transverse and lateral grade. This loading end of the pendulum was propelled by pushing or pulling a draw bar attached to one of the two 5-cu. yd. electric shovels used to feed the hopper.

This loading hopper was supported on four large dual-tired caster wheels, which it is believed are original in design and which were constructed entirely by welding. The entire pendulum was re-designed through the use of welding; in fact it is questionable whether it could have been satisfactorily rebuilt without its use. Many heavy connections were involved as the total weight of the machine was approximately 400 tons. Welding was particularly useful in hard-facing the teeth of the chopper roll to increase resistance to abrasion encountered in beating down

large diameter lumps of hard clay frequently found in the borrow pit. The chopper teeth would rarely maintain full dimension for more than one week of operation in this pit and frequent hard-facing was required. Tension bars supporting one end of the 150-ft. truss span were welded up out of thick-wall tubing and structural members and would have been very difficult to fabricate by any other method.

Caster wheels

The four caster wheels used in the mechanism were slightly over 10 ft. in height and had a throw of 24 in. The wheels used in each assembly consisted of two 24-in. diameter welded drum assemblies equipped with tapered roller bearings turning upon a fixed axle and upon which were mounted 21.00 x 24, 30-ply rubber tires. The load was transferred to the ends of the axle through welded steel U-shaped saddles into which the caster spindle had been welded.

It was not possible to obtain suitable forgings or castings as a bearing mounting for these spindles within the time and money available, and for this purpose a welded assembly of plates and thick wall tubular members was fabricated and into it large diameter bronze bushings were placed. These bushings were bored to a 12-in. diameter at the base and a 9.25-in. diameter at the top. Roller bearings to resist the combined radial and thrust loading on each caster wheel spindle were considered, but this plan was abandoned in view of costs and excessive delivery time. The bronze bushings functioned with entire satisfaction and gave no trouble whatever

Data and illustrations in this article are from a study submitted to The James F. Lincoln Arc Welding Foundation in its recent \$200,000 Design-For-Progress Award Program for reports and advances and improvements made by the applications of arc welding in design, fabrication, construction and maintenance.

during their entire period of use.

The welded box assembly in which the bushings were mounted was made without undue distortion, as evidenced by the fact that their outside faces were field erected without further machining between parallel webs of the 36-in. wide flange beams used as structural supporting frames in the main hopper. Connecting angles of 5 x 5-in. steel were used to bolt this box into the webs of the beams and could have been eliminated by projecting the two side plates of the box itself but the designers were limited on the size of the box to 26 in. square since that was the maximum size that could be accommodated in the lathe available at that time for making the finishing cuts on the spindle bearings.

Total weight on the four caster wheels supporting the loading hopper and one end of the 150-ft. conveyor truss was 374,000 lb. and the maximum load

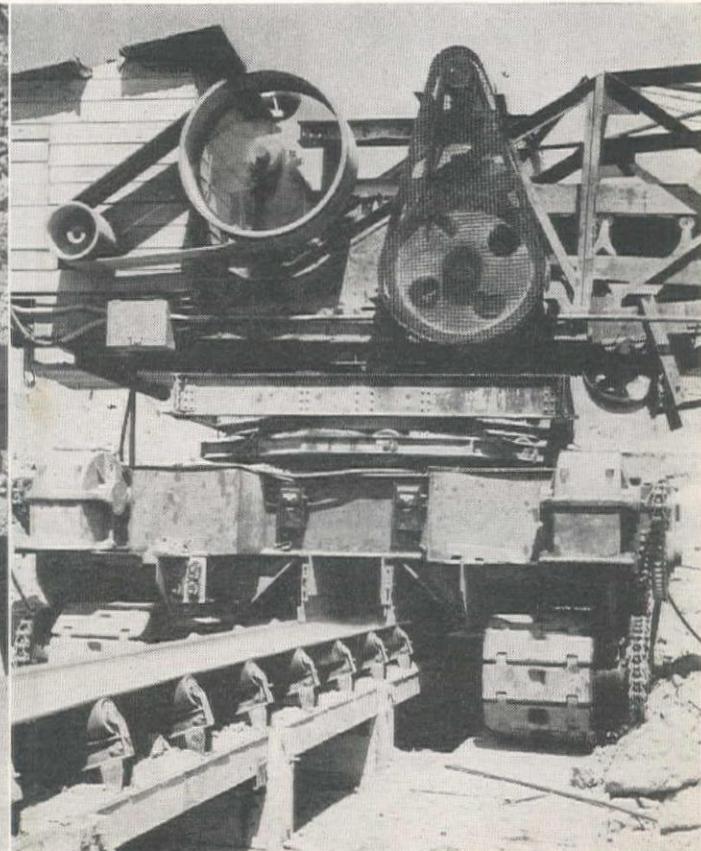
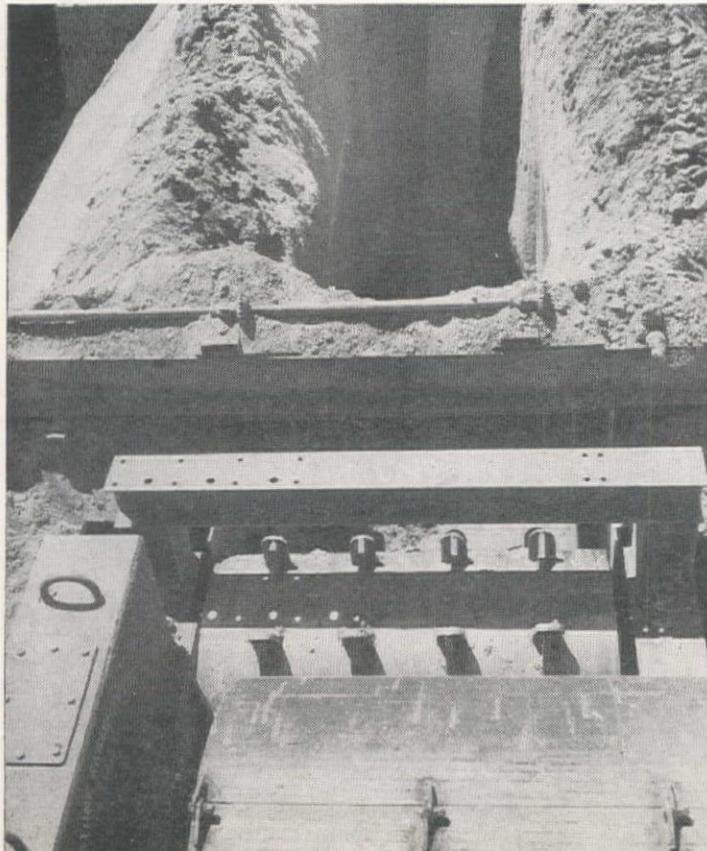
TOP VIEW of the hopper, left, shows the manganese pan feeder and chopper roll which handled a maximum feed of earth of 1,600 tons per hour. Discharge end of pendulum, right, shows track rollers and drive mechanism. Entire machine at this end walked above and parallel to field belt.

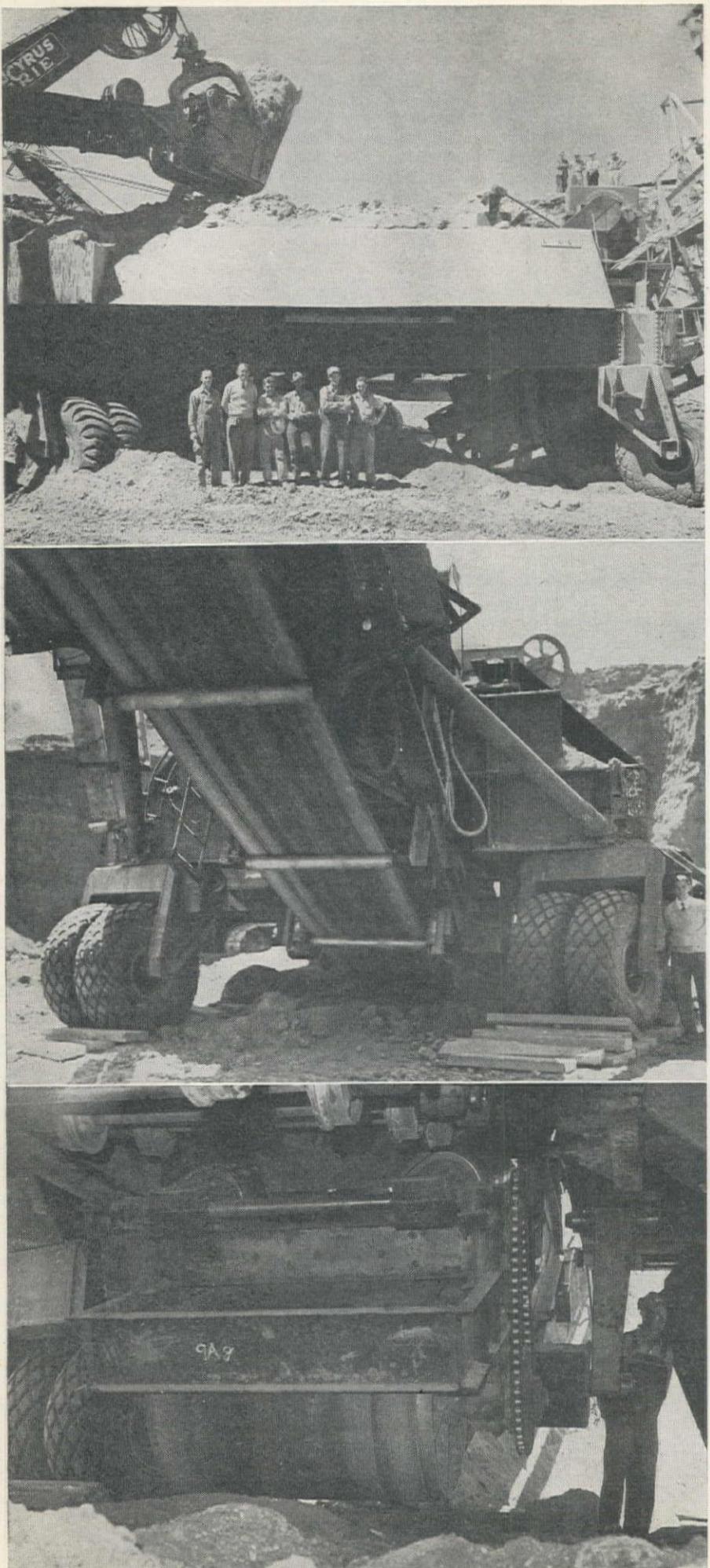
at any one wheel in its most unfavorable position was 120,000 lb. The caster spindle and other component parts of the wheel assembly were designed to resist this load as a vertical reaction coupled with the horizontal loading resulting from the wheel being pulled up over a 1-ft. high obstruction, such as a 12-in. timber which might accidentally be in the path of the wheel. While this design loading is extreme, subsequent use of the machine indicated that similar combinations of loading actually occurred while shifting the machine with the electric shovels without damage to the wheels or interruption to the work.

Field operation

In actual operation this machine enables the excavation of an area 400 ft. wide, 60 ft. deep and unlimited in length by two electric shovels working adjacent to the loading hopper, from one position on a fixed field belt. A double hinged suspension with universal jointed struts at the loading hopper end and hinged turn-table at the discharge end allow this pendulum machine to work at any angle and at an elevation anywhere between 30 ft. above and 30 ft. below the elevation of the field belt.

During field assembly of the caster wheels it was necessary to block up the structural framework and hoist the eccentrically loaded caster wheel up through the bearing housing and then to cap the housing with a 15-in. diameter steel plate, held in place by six stud bolts. Clearances in the spindle bearings and the tube cap plate were so accurately made that it was possible for one man to turn the entire caster wheel by hand with the spindle in a vertical posi-





tion, notwithstanding the large eccentricity in the suspended weight.

Tire pressure during operation proved most satisfactory at 100 lb. per sq. in. The tires themselves supported a load substantially 100 per cent greater than that usually recommended for "off the road" tires of this type; the recommendation, however, was not essentially correct in this case since there was no velocity and therefore no heating of the severely flexed side walls. The only real difficulty encountered in the tire operation occurred when the teeth of one of the electric shovels punctured one of the dual tires, whereupon it instantly exploded.

Cost

The four caster wheel assemblies described were manufactured at a cost of \$10,340, exclusive of tires and tubes, and weighed approximately 36,550 lb., indicating a unit cost of \$0.283 per lb. The entire mechanism, using portions of existing trusses and other materials on the site cost approximately \$65,000. What this might have cost had some method other than welding been employed is not known, as many of the connections used would literally have been impossible within the space limitations set up.

Assuming that castings and forgings had been available, it is very doubtful whether they could have been produced and machined at less than \$0.50 per lb. and the resulting machine would have been much heavier. Dimensional clearances were especially tight under the front end of the pan feeder and in the caster wheel itself because the entire wheel assembly, supporting structural steel cross members, and suitable clearances for pivoting the rear end on a goose-neck connection for three point support, had to fit under the protecting steel skirts of the hopper not more than 15 ft. above the ground. This height was a limiting factor in the entire design, as it was the maximum practicable dumping height for the two 5-cu. yd. electric shovels used in the excavation.

Welding in this instance was, therefore, responsible for putting into use a machine that reduced earth handling costs by probably .10 per cu. yd., and getting that machine into production months ahead of any comparable design that might have been compounded using castings, forgings, and rivets. Furthermore a design of this latter type might well have proved more expensive and cumbersome than could have been justified by the work to be done. The welded design also permitted use of miscellaneous structural steel material already available at the site of the work.

LOADING HOPPER, top, weighed 400 tons and was supported on four large dual-tired caster wheels of original design. This end of the pendulum was propelled by means of a drawbar attached to one of the 5-cu. yd. feeder shovels. Under view of the hopper, center, shows the caster wheels and steel U-shaped saddles into which the caster spindles were welded. Double-hinged suspension hanger for the conveyor truss, at bottom, enabled the machine to work at any angle.

Use
of
Engineering
Principles
in
the



Courtesy California Monthly

Design of Better Artificial Limbs

ALTHOUGH engineers already have a profound understanding of the physical laws governing the mechanics and forces involved in the creation of structures, the human body remains the outstanding example of coordinated engineering principles of force and motion; dynamic or static. Even the comparatively simple process of walking involves mechanics of motion and interrelated forces that man can not duplicate with any mechanical contrivance.

Howard D. Eberhart, associate professor of civil engineering at the University of California at Berkeley, is surely a man who realizes fully that an understanding of the fundamentals of human locomotion should be brought within the realm of man's knowledge. He knows that a knowledge of these fundamentals would make possible a more rational approach to the improvement of locomotion troubles that man is subjected to, such as amputation and infantile paralysis.

For, through a peculiar set of circumstances, Professor Eberhart has become involved in such a study of the complexities of human locomotion. Today, in the engineering materials laboratories at the University of California, doctors,

engineers and technicians are working in a coordinated program to investigate human limbs and muscles as they carry out their function of propelling the human mechanism.

And even though a perusal of the studies being made rings with the sound of engineering materials and mechanics terminology—velocities, acceleration, internal and external forces, structural analysis and materials—still, the studies are far removed from the inorganic atmosphere of the civil engineering materials testing laboratory. The interest in a part of the U. C. laboratories has shifted from tests of concrete, wood and metals to focus on a warmer subject, the study of everyman's machine, the body.

More specifically, the research program is aimed at trying to experimentally determine specifications for the best artificial limbs possible. The research is an answer to the need for fundamental investigation for gaining data which will be used as bases for

PROFESSOR HOWARD EBERHART, at top of page, University of California engineer, himself an amputee, now plays a leading role in the research program as the result of a peculiar set of circumstances.

rational development in the future. The design of prosthetic devices (artificial limbs) has during the past too often been characterized by empirical developments and "gadgeteering."

Accident stimulated interest

Eberhart himself was interested in the study of prosthetics more than four years ago, but a quirk of fate which resulted in making him an amputee spotlighted his attention and fostered an attitude of personal understanding which no person fully equipped with arms and legs can hope to attain vicariously. He lost his left leg below the knee as the result of an accident which occurred at Hamilton Field, Army Air Base in Marin County, Calif., in the summer of 1944.

There, another research crew from the University of California was testing the paved runways and parkways used by heavy bombers of the air force. A 200,000-lb. trailer was being used to simulate the landing gear and total weight of one of the huge bombers. While Eberhart was kneeling to fix the adjustment of an electrical strain gage, one of the huge wheels passed over and crushed his lower leg.

Later, during discussions with doctors at the Mare Island Naval Amputation center, he grew interested in applying his engineering abilities to the building of scientifically engineered artificial limbs. Today, he has a responsible position of leadership in the entire project at U. C.

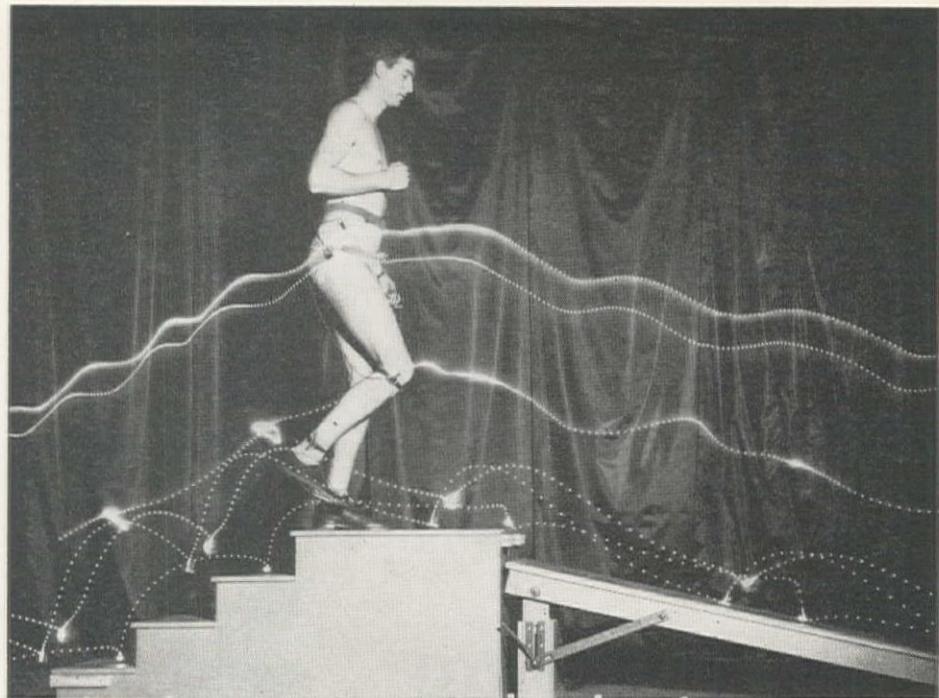
The program which has mushroomed into such large proportions at the University is being sponsored now by a governmental unit under the jurisdiction of the Veterans Administration, the Committee on Artificial Limbs. Three other universities and a number of private companies are combining their efforts under the guidance of this committee.

The entire program is an outstanding example of two highly technical professions combining their talents and methods into an integrated study. Engineers and doctors working hand in hand have accomplished a unity of skills which promises that soon amputees will have scientifically developed limbs to help them back into useful, productive living.

Engineers might well be interested in the ingenious techniques being used in this specialized research. For all of the different investigations, special testing equipment had to be devised. The more typically engineering aspects of the research required the devising of equipment and methods for obtaining data such as that on rotations of the limb in space, velocities and acceleration, internal and external forces acting on the limb, and the structural requirements of the materials used for artificial limbs.

Study of locomotion

The first problem facing the researchers naturally was that of obtaining fundamental data on locomotion both in the normal subject and in the amputee in order to provide design information. A variety of methods and equipment were used for these studies. Those from which most of the data applicable to the actual structural design of artificial



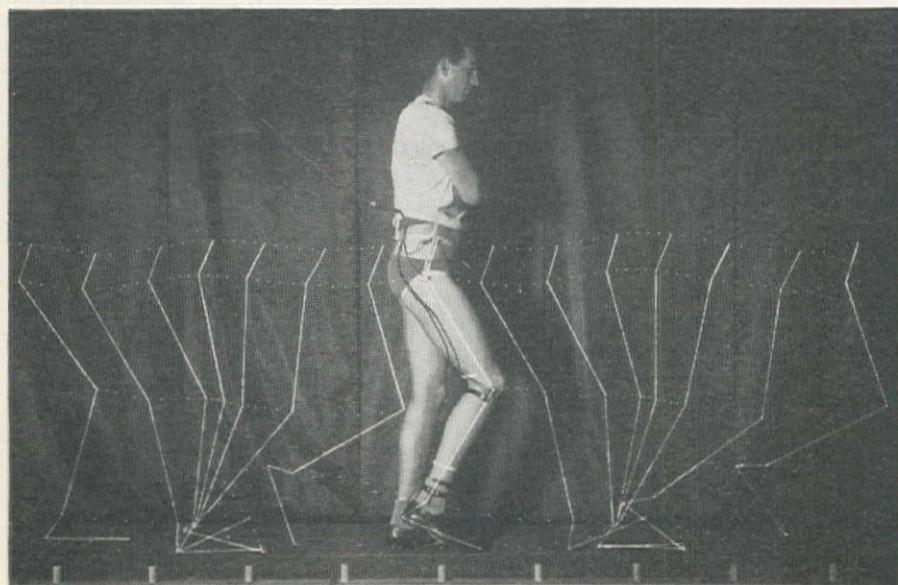
PATTERN OF LIGHT, above, was made as the subject walked in front of the camera while wearing small bulbs attached to pins placed over the assumed positions of joints in the leg. The photographs helped supply displacement-time data used by the researchers.

limbs was obtained are the "pylon tests," force plate measurements and interrupted light studies.

In the "pylon tests," information relative to the forces acting on an artificial leg in use were obtained. The pylon is a column structure which replaces the shank member of an artificial leg. Electrical gages bonded to the pylon provided a means for obtaining continuous record of the actual forces acting during any operation. These gages employed a bonded metallic filament as the strained element and were connected in a Wheatstone Bridge circuit, whose unbalance was a measure of the strain.

Volunteers wearing the artificial leg

CORRESPONDING POINTS of light joined together on the photograph show the relative positions of joints in the leg of a normal subject walking on the level in front of an open lens. The rotation of the various segments of the leg are an important factor in walking and, in ideal design, should be duplicated in an artificial limb.



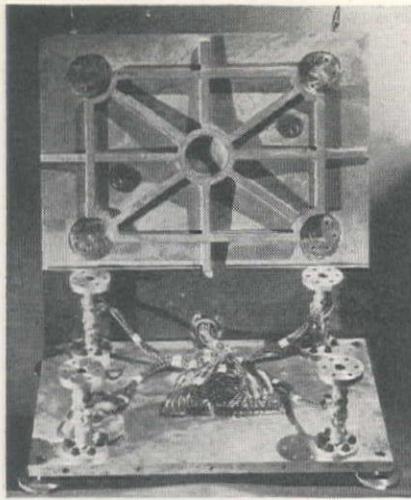
built in the laboratory with the aluminum tube pylon ran and walked up and down stairs while a mass of data was recorded from the gages by means of a 12 channel oscillograph. From these measurements, maximum loads to which the shank of an artificial leg is subjected were later determined.

The magnitude of the axial load was also calculated analytically in order to check the results of the experimental measurements. Quantities measured by means of the pylon included moments both at the upper and lower ends of the shank. With these moments known, the position of the shank in space known, and the point of application of floor reaction to the foot estimated from the motion pictures which were taken of the operation, enough detail was provided for analytical checking of the gage records.

Floor reactions

A "force plate" was used as the most direct method for measuring the floor reactions and thus determining the forces acting on the leg of normal subjects. It was concluded that the most convenient way of completely describing forces acting on the limb during locomotion was to measure separately the components of force and torque referred to the surface on which the subject was walking.

Briefly, the force plate as installed flush with the walking surface consists of three independent load measuring systems in which the supporting members are deflected by the foot and the strains are recorded by means of resistance wire strain gages connected to a recording oscillograph. In addition, the instantaneous position of the center of pressure of the floor reaction on the foot is recorded. Thirty-five millimeter motion pictures were taken simultaneously



FORCE PLATE, with an electric strain gage support at each corner, was installed flush with the walking surface. With it, components of force and torque were obtained for normal walking.

with the force measurements to establish the position of the segments of the body relative to the force plate.

The following is an example of the type of data obtained by this method. "A typical curve of vertical floor reaction for a normal subject in level walking contains two maximum values of force and one minimum, the maximum values being greater than body weight and the minimum less. The maxima occur when the body is being accelerated upward. This force will be the sum of the body weight and the force required to accelerate the body upward. The minimum force represents the difference between body weight and the inertia force of the body in decelerating upwards."

The "interrupted light studies" were used to obtain displacement-time data to furnish the necessary relationships for finding velocities and accelerations at any point on the leg, or more simply, to quantitatively determine the average gait of the walking subject. This method consisted of the subject walking in front of the open lens of a camera while wearing small light bulbs over the assumed positions of the joints in his leg. The field of view of the camera was interrupted at short time intervals by a slotted disc so that the displacement patterns on the film of the camera appeared to be small lights moving along the path of each joint and flashing at short, equal time intervals. This was the most obvious method of determining the displacement pattern of the joints in the leg in the vertical plane of progression.

Rotation studies

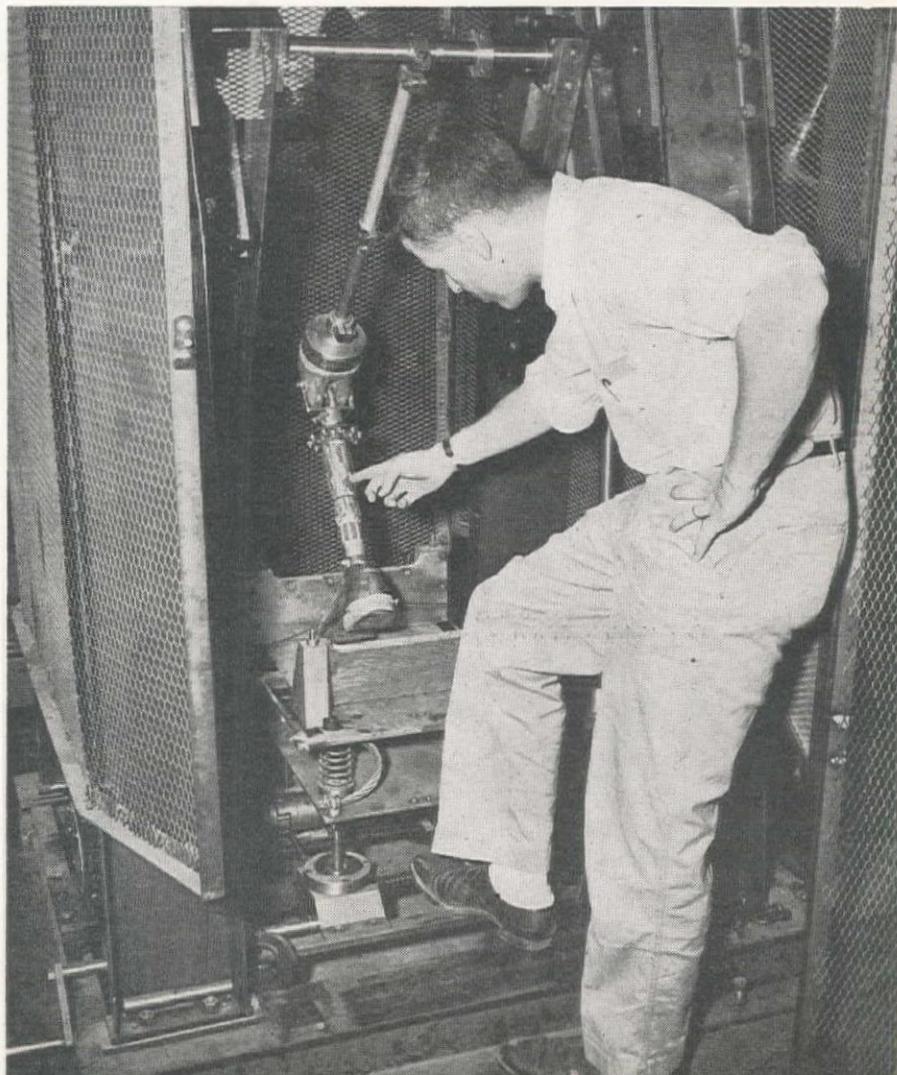
To determine the rotation of the hip and knee joints during walking, the "pin study" technique was devised. Stainless steel threaded pins were drilled firmly into the protruding bones of the hip and above and below the knee. Targets consisting of light wooden rods with a white ball on the end were fastened to the pins. Top, front and side views of the volunteer subjects performing various walking operations were recorded by three 35-mm. synchronized motion

picture cameras operating 48 frames per second. The cameras were oriented as to refer the targets then to three mutually perpendicular reference planes.

These rotations of the various segments of the leg are an important factor in the ease and rhythm of walking of normal individuals. A possible future development resulting from information gained from this study may be the incorporation of a simple mechanism which provides for transverse rotation, or twisting of the leg and ankle, of sufficient magnitude together with a unit for the return of the foot to a normal position. This would constitute a major contribution to the comfort of the amputee and the improvement and synchrony of his walking.

After data concerning forces acting on the leg had been obtained by these and other methods, the results computed and analyzed and critical loads determined, enough information for a tentative determination of the strength requirements for a scientifically engineered artificial leg was available. This work of analysis and application is still under way at present.

MACHINE DEVISED in the research laboratories to subject an artificial leg to a fatigue test analogous to three years' normal service in about 12 days is pointed out by Research Engineer JACK FRANKEL. The specimen leg is positioned in the machine in such a way that a single varying force induces bending, thrust and shear. The load is transmitted to strain gages and strains are recorded on an oscillograph tape.



Selection of materials

But to make a proper design for adequate strength and minimum weight, a careful selection of materials must be made as to physical and mechanical properties as well. These tests were more in line with the usual work in the engineering materials laboratory.

A number of different materials were tested using the equipment of the laboratory adapted to the tests. Tests for such properties as compression strength, tension, bearing, flexure, brittleness, etc., were run on the laboratory's Southwark-Emery hydraulic testing machines. Materials tested ranged from a number of plastics with a myriad combination of resins and fillers to impregnated balsa wood.

Apparatus to provide life service tests on artificial legs was designed and built. For instance, the B. K. tester (below the knee prostheses) was devised to subject an artificial leg to a fatigue test analogous to the amount of walking equivalent to three years' normal service in about 12 days. The specimen leg is positioned in this machine in such a way that a single varying force induces bending,

ing, thrust and shear. The varying load is applied by an eccentric on a drive shaft which is driven by an electric motor through a speed reducing system. This load is transmitted through the specimen to a cantilever spring on which strain gages are mounted and these strains are recorded on an oscillograph tape.

We have described briefly here only a

portion of the ingenious methods being used by the research crew. Practical application of the data is in the process of being made, and there is little doubt that results will be forthcoming in a not too distant future. The importance of the research is summed in a statement by Professor Eberhart, in which he modestly says, "We've placed the problem on a scientific basis."

to Hoover Dam, 70 mi. of 230-kv. line from Davis Dam to Parker Dam, 50 mi. of 69-kv. line from Brush to Yuma, Colo., 30 mi. of 115-kv. line from Loveland to Greeley, Colo., and a line from Anderson Ranch Dam to Mountain Home, Idaho; construction of a steel pipeline for the Big Cottonwood section of the Provo River project in Utah; and construction of a 12,000-ft. concrete and steel siphon near Soap Lake, Wash.

Canal work to be advertised within the next two months includes 17.2 mi. of the Friant-Kern canal near Porterville, Calif.; main canal and laterals on the Savage Unit near Glendive and Sidney, Mont.; 15.3 mi. of the West Main canal of the Columbia Basin project near Ephrata, Wash.; relocation of the Willwood canal near Powell, Wyo.; 6.6 mi. of the Main canal of the Columbia Basin project near Stratford, Wash.; earthwork and structures for lateral distribution systems in seven pump areas on the Roza Main canal near Yakima, Wash., and check and turn-out structures on the Gila gravity Main canal.

Reclamation Projects Soon To Be Advertised for Bid

INVITATIONS TO BID on several important construction jobs have been issued by the Bureau of Reclamation in recent days and others will be published in the next few weeks. On March 1 invitations to bid were issued for the stripping, processing and stockpiling of concrete aggregate on the Riverton project 20 mi. northeast of Riverton, Wyo., and on construction of 4 residences and garages for the Deschutes project near Bend, Ore.; on March 5 the construction of earthwork and structures on 13 mi. of the Cambridge canal near Cambridge, Neb., was advertised, as was the construction of 68 mi. of wood pole transmission line along the Yakima Ridge canal between Yakima and Benton City, Wash.; on March 9 the earthwork, lining and structures for 13.6 mi. of the Delta-Mendota canal of the Central Valley project near Tracy, Calif., including 5,000,000 cu. yd. of excavation, was advertised; and on March 10 invitations were issued on the construction of lateral canals near Pavillion, Wyo., and for construction of concrete pipeline and structures on the Coachella Valley distribution system near Indio, Calif.

Bid invitations will be issued about March 12 for the construction of Meeker diversion dam, a temporary pile and timber structure for the Frenchman-Cambridge unit near Culbertson, Neb.; on March 19 the construction of earthwork and structures for laterals and drains on the Klamath project near Tulelake, Calif., will be advertised; on March 26 invitations will be issued on 22 mi. of 69 kv. wood-pole transmission line between Oakley and Concord, Calif.; and also for 2,500 ft. of concrete siphon for the Cambridge canal near Oxford, Neb.; and on March 31 the erection of 20 temporary houses at Delano, Calif., will be advertised, as will the installation of sewer, water and electrical systems for the Bonny Dam government camp near St. Francis, Kans.

Other bids soon to be advertised by the Bureau but for which definite dates have not yet been assigned include the improvement of 7 mi. of the Lost River channel approximately 10 mi. southeast of Klamath Falls, Ore.; construction of the Cedar Bluff government camp near Ellis, Kans., and the Mirage Flats government camp near Hay Springs, Neb.; completion of Wickiup Dam near Lake Lapine, Ore.; construction of Dickinson Dam, an earthfill structure near Dick-

inson, N. Dak., and Cedar Bluff Dam, an earthfill structure on the Smoky Hill River near Hays, Kans.; placing a concrete spillway on Newton Dam near Newton, Utah; erection of the following transmission lines: 260 mi. of 230-kv. line from Davis Dam to Phoenix, Ariz., 70 mi. of 230-kv. line from Davis Dam

LONG CONVEYOR BELT FURNISHES AGGREGATE AT FORT GIBSON DAM

A CONVEYOR belt 2,000 ft. long, made by B. F. Goodrich Co., is used to haul concrete aggregate up to 6 in. in diameter to the mixer storage hoppers at Fort Gibson Dam on the Grand River in Oklahoma. The dam is under construction by Johnson-Winston-Kiewit for the Corps of Engineers, and is principally a flood control structure, which will cost in the neighborhood of 35 million dollars. The belt is operating at an angle of 17 deg. at a speed of 308 ft. per min. It is 30 in. wide and consists of five plies of 32-oz. duck. The reservoir will inundate 19,000 ac. of land, and in addition to furnishing flood control for the flood plains of the Arkansas River valley, will provide an important power generating facility and great recreational advantages.



Colorado River Meet Fails to Agree

INTERSTATE SQUABLES, largely over diversion of Colorado River water from one watershed to another, marked the recent sessions of the Colorado River Water Users Association's annual conference in Salt Lake City. Far from reaching agreement on the troublesome problem of division of the water between the seven states in the river basin, the members went home from the conference with differences of opinion more than ever dividing the states into two hostile factions.

The Association conferees charged Colorado with "exploitation" of more than 2 million ac. ft. of Colorado River water and urged in one of its nine resolutions that the matter be taken to the U. S. Supreme Court for litigation. This resolution, prepared by Alvin B. Shaw, Jr., deputy attorney general of California, asked Congress to approve a pending bill to send all aspects of the many-sided question to the supreme tribunal.

Shaw, in justifying wording of the resolution, questioned the economic justification of transmountain diversions such as the Big Thompson project in Colorado, which he claimed would unbalance the development of the natural basin.

The interstate compact and the federal law now provide for division of the Colorado River water at Lee's Ferry in Utah, giving the lower basin states 7,500,000 ac. ft. annually and the upper basin the same amount, provided there is enough water. The specific charge against Colorado is that diversion tunnels under the continental divide to the Colorado east slope will take too much water from other areas served by the Colorado River.

Water basin "rivals"

The Colorado River Water Users Association is one of two "rival" organizations representing states along the Colorado River. The Association has representatives on it from all seven of these states—Wyoming, Colorado, New Mexico, Utah, Arizona, Nevada and California. It derives most of its strength from the last three states, the lower basin states.

Its rival group is the Colorado Basin States Committee, composed of two representatives from the four upper basin states and Arizona. Nevada and California were members when it was called the "committee of fourteen," but withdrew three years ago because of the water rights dispute. At recent meetings in Salt Lake City and in Denver, the Committee has opposed most of the Association's proposals.

Limiting law proposed

The Association has expressed fears that Colorado's increasing transmountain diversion may cause an ever greater shortage of water in the river. In another pointed resolution, it asked Colorado to pass a law limiting its trans-

Water Users split over diversions of Colorado flow out of its own watershed—Colorado accused by Upper Basin states of diverting more than its proper share, and Colorado in turn attacks California as "water hog" — Nevada attempt to mediate California-Arizona dispute fails

mountain water exports to an amount that would not imperil the delivery of at least 7,500,000 ac. ft. of water at Lee's Ferry. The resolution asked that the compact require that this amount of water be left in the river for use of lower basin states.

The move was interpreted by Colorado observers as an obvious attempt by California to prevent Colorado and the other upper basin states from utilizing more water from the river. California spokesmen have recently served notice that they would fight for a greater share of Colorado River water in the next year.

This resolution also asked that the law require that Colorado's exportation of water to the East Slope will not imperil the 750,000 ac. ft. of water which, in times of shortage, is required to fill the U. S. obligation to Mexico under provisions of a treaty with the border neighbor.

At the time the Hoover Dam project was approved, the Bureau of Reclamation had estimated that the total diversion by Colorado would be less than 350,000 ac. ft., but it is now anticipated that Colorado will take 2,200,000 ac. ft. out of an estimated total for all upper basin states of 3,300,000 ac. ft.

The Association points out that the problem has now become so acute that it was necessary to recommend to Congress that no new developments on the river be contemplated until it is settled and water rights have been clearly determined.

Nevada as mediator

It was Nevada that first demanded that lower basin states disputes over water allocation be settled by the Supreme Court. Nevada's main objective in the controversy is to act as mediator between California and Arizona. "Unless this dispute is settled," stated Governor Pittman of Nevada, "there can be little or no further development of Colorado River projects which would be of benefit to all the lower basin states."

The Association attacked Utah and Arizona as well as Colorado. Rex Hardy, assistant city attorney of Los Angeles, said that the three states had been guilty of misstatements to the effect that California is strictly limited to 4,400,000 ac. ft. of water. "If we are not entitled to the water we think we are," Hardy said,

"then we want the Supreme Court to let us know this fact rather than piddle along on political fights in Congress." In answer to Hardy's recommendation, a conferee from Utah questioned the advisability of asking Court litigation and proposed a resolution calling upon the states to settle their own differences. California delegates defeated this substitute resolution.

The resolution calling for litigation by the higher courts was the exact opposite of that taken a few weeks ago by the Colorado River Basin Committee.

A. L. Goess of Paonia, Colo., on Colorado's Western Slope, also criticized the Big Thompson project which he said "got away from us because we were asleep at the switch." He urged no diversions as long as water could be utilized on the watershed in which it originates.

Perry W. Jenkins, general manager of the Green River Basin Development Co. of Wyoming, asserted that Colorado "has been scrambling ever since the compact was signed to get water to the eastern slope, leaving Utah and Wyoming to meet the obligation to the lower basin." He suggested that the upper basin states agree on the diversion of their "water debt to the lower basin" on a basis of the state's "ability to pay," with remaining water then to be allocated.

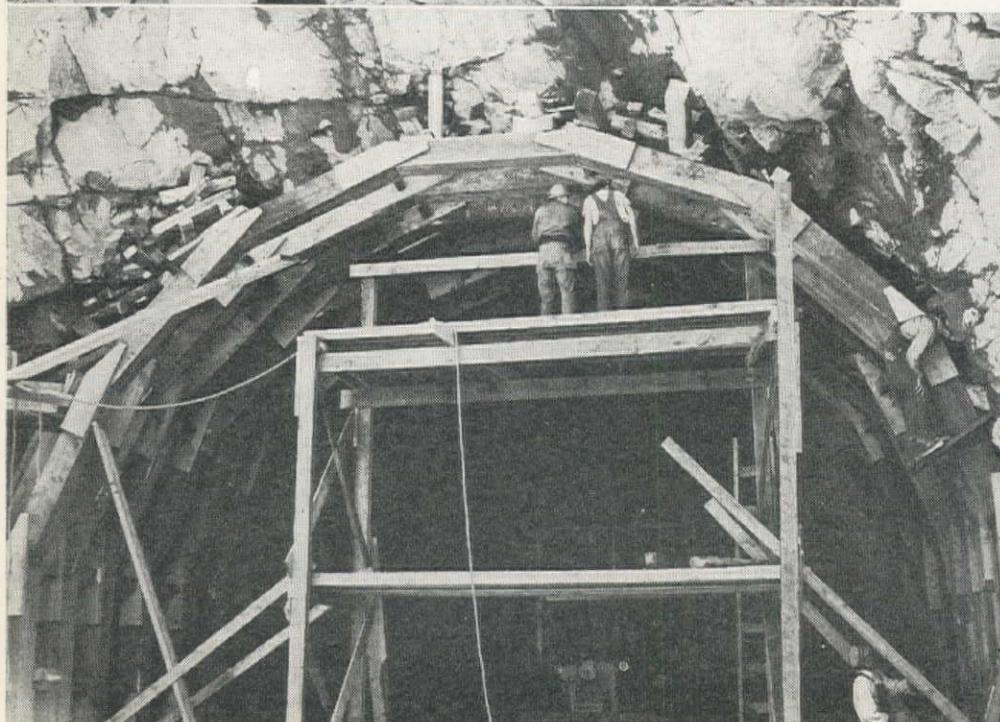
Case for the upper basin

Governor Lee Knous of Colorado meanwhile blasted California policies. He bluntly charged California with "trying to hog Colorado River water," and with attempting to defeat efforts of the upper basin states to make a compact dividing the upper basin share of the water. He expressed hope that a division of the water will be made through a compact before summer.

Arizona rallied to the support of Colorado when J. Howard Smith, secretary of the Central Arizona Project Association, charged that California herself operates transmountain diversions far in excess of the fondest dreams of Colorado, taking 2,700,000 ac. ft. annually out of the river basin into the Imperial Valley and proposing to take 1,100,000 ac. ft. more through the Los Angeles aqueduct to the coastal plain. He also pointed out that the Colorado River Compact, to which California is a party, specifically provides that any basin state can use its share of Colorado River water anywhere within its borders and that no other state may question transmountain diversions. He also pointedly stated that Colorado contributes 50 per cent of all water in the river, while California contributes none.

Members of the Association re-elected J. H. Buehler of Pioche, Nev., as president before adjourning the meet. Also renamed were Chauncey Sandberg of Hurricane, Utah, as vice-president, and A. J. Shaver of Las Vegas, Nev., secretary-treasurer.

Highway Tunnel in Colorado



New road following old narrow gauge railroad roadbed in Clear Creek Canyon embraces heavy excavation and numerous tunnels — First section nearly completed, with 858-ft. tunnel the first to be finished, requiring only 72 days

IN CONSTRUCTING the first unit of the Clear Creek Canyon section of U. S. Highway 40 through Colorado, the first contract was awarded in April, 1947, to the Larson Construction Co. of Denver. This contract consisted of driving a tunnel 858 ft. long as an enlargement of a pioneer bore driven some years previously and the grading and paving of one mile of the highway.

The Clear Creek road will replace a former mountainous section of U. S. 40 and will follow generally the roadbed of an abandoned narrow gauge railroad which formerly served gold mining camps in the area. The granite walls of the canyon are precipitous and the highway roadbed is perforce wider than the old railroad bed. There is, therefore, involved a rather heavy grading problem and a total of six tunnels which will cut off twisting segments of the rail line. The total project, which will include about 2,000,000 cu. yd. of rock excavation, is estimated to cost about \$3,500,000. The Larson contract for the first section amounted to \$332,878.

The tunnel is a semi-circular arch which will not require lining. It is 32 ft. wide at the roadbed and 22 ft. high. From 85 to 100 holes were drilled to an

Photos by R. G. Zellers.

average depth of 15 ft. per round and were spaced 18 in. apart around the perimeter of the tunnel and at various points on the face.

The J. R. Austin Co., highly successful Colorado contracting firm, subcontracted the tunnel work. It built a drilling jumbo mounted on a rubber-tired trailer, from which several pneumatic drills could be operated simultaneously. After firing, the tunnel face was mucked by a shovel with a fore-shortened boom discharging into Koehring dumpers. The tunnel was holed through at the end of August after 72 working days. Paving and other excavation has continued since that time.

The accompanying pictures illustrate the tunneling operations:

Upper left: portal of Clear Creek Tunnel No. 1, showing jumbo shovel, dumpers and other equipment at the contractor's camp; the old narrow gauge railroad roadbed is shown turning off to the left to follow the canyon around the rocky spur through which the tunnel passes.

Lower left: timbering at the portal of the tunnel; the bore will be unlined except at this one entrance where fractured rock might be hazardous.

Center: view during construction toward the portal of the tunnel through the completed section; the substantial character of the rock can be observed.

Upper right: the three-deck, trailer-mounted drilling jumbo with attachments for air hoses and ample space for change steel and other drill machinery; the previously completed 7 x 7-ft. Pioneer tunnel can be seen above the top deck of the jumbo.

Center right: operating one of the Ingersoll-Rand drills from the lower deck of the steel frame jumbo; holes were generally 15 ft. deep and the rock broke cleanly.

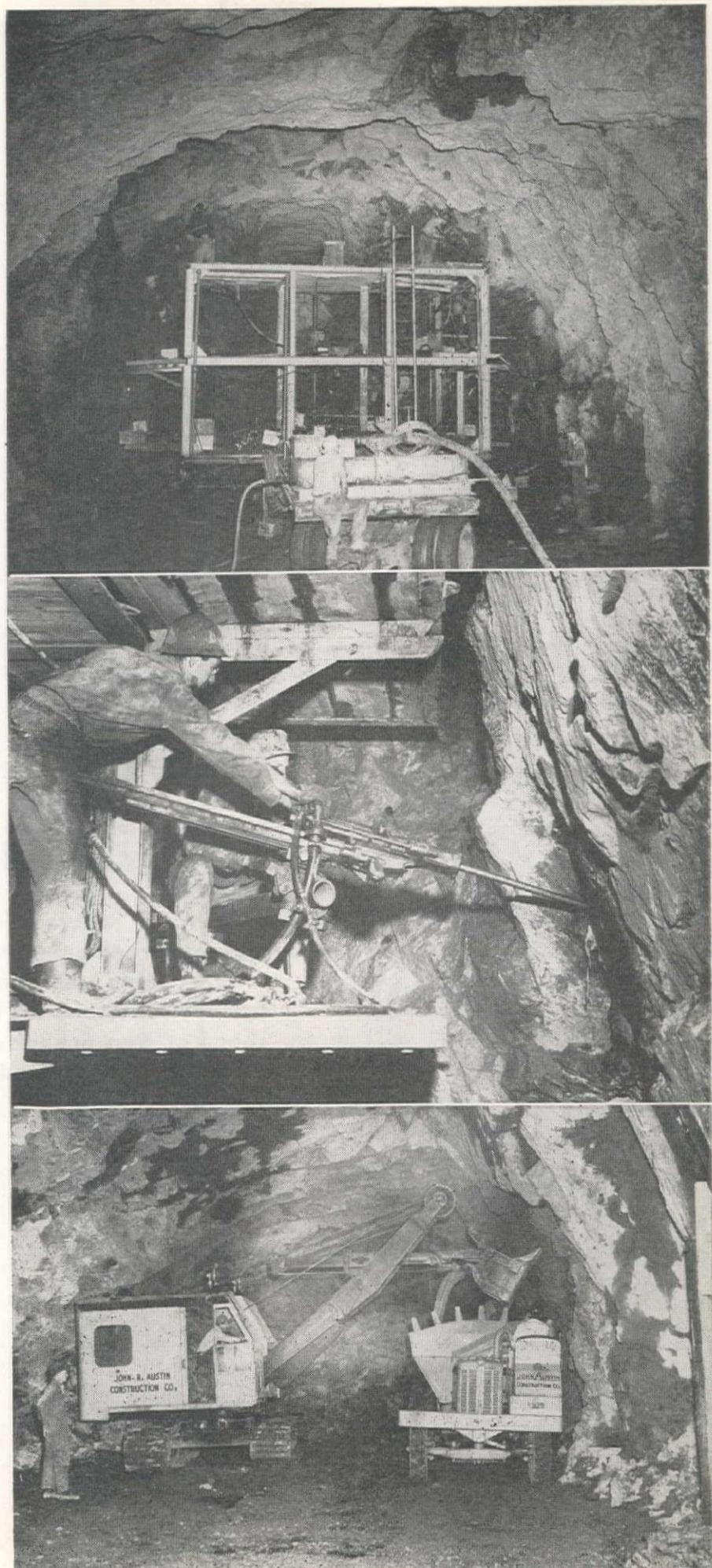
Lower right: mucking in the confined space of the tunnel was performed by a Northwest shovel with a shortened boom; broken rock was transported to the waste pile by dumper.

Kaiser Buys Utah Blast Furnace and Coke Ovens

PURCHASE of a blast furnace and coke ovens in Utah from the War Assets Administration for \$1,150,000 has been announced by Kaiser-Frazer Corporation. The plants, originally built at a cost of approximately \$13,000,000 and operated for the Government by the United States Steel Corp., have a capacity of 300,000 tons of pig iron a year.

The purchase will open up a new source of iron for Kaiser-Frazer's program of stepping up production to 1,500 automobiles a day. The pig iron will be used in the foundries of Kaiser-Frazer and will be supplied to other industries supplying steel products to the Willow Run plant.

The blast furnace, moved during the war from Joliet, Illinois, is located at Ironton, near Provo, Utah. The purchase includes 500 bee hive coke ovens near the Price, Utah, coal fields.





Eastshore Freeway— Roadbed Stabilization in Marshland

A NEW METHOD of securing roadbed stabilization over soft base material has been employed by the California Division of Highways, in construction of a 2.3-mi. tangent section of Eastshore Freeway near the south city limits of Oakland, where the route of the new artery crosses low-lying salt marsh and numerous small meandering tidal inlets and upland drainage channels.

The work was the first stage of construction for the section. The paving will not be undertaken for some time after various bridges have been built and other sections of the freeway are completed. The area included in this particular project runs from a point 1,600 ft. south of Hegenberger Road to 50th Ave. Ultimately the Eastshore Freeway will provide through highway service between the San Francisco-Oakland Bay Bridge and all the East Bay cities. Work on the Fifth Ave. Overpass, one of the large structures on the freeway, was discussed in the December, 1947, issue of *Western Construction News*.

New stabilization method

This section being over extremely unstable marshland mud, sometimes covered with salt water and always saturated, it was obvious that stabilization of some sort was required before a high-

Removal of soft material from roadbed right-of-way and replacement with hydraulically placed dredged sand is method used to stabilize unsatisfactory base for new freeway along the eastern shore of San Francisco Bay — Pump line is five miles long from dredger to point of discharge

way could be built across it. Various methods of treatment were considered. The California Division of Highways was a pioneer in development of sand piling underdrains for removal of ground water, in such cases as this (see article on Terminal Island Freeway, Nov., 1947, *Western Construction News*). In other instances, a heavy overload of material has been placed over unstable foundations to squeeze it down to a point of stability (see article on Petaluma Highway, Jan., 1947, *Western Construction News*). Again, unsuitable material has been excavated and wasted, to be replaced by stable soil or gravel trucked into place (see Salinas Highway story, Oct., 1946, *Western Construction News*). Other more or less successful means have been employed on various projects.

However, for the first time, on this project, the undesirable mud and clay

F. W. MONTELL, resident engineer on the Eastshore Freeway hydraulic fill section, stands beside the outlet of the 5-mi. dredger pump line. After excavation by clamshell dredge, the roadbed was built by placement of 890,000 cu. yd. of sand.

were removed by floating dredges and piled along the side of the final roadway to act as a restraining barrier for a backfill of stable sand placed hydraulically from a floating dredge. In other words, instead of treatment of the residual material, it was removed and replaced by the simplest and cheapest of means.

Type of material

The native material varied somewhat over the job, but all of it was unsuitable. Over the major portion of the job, across the tidal marshes, a soft blue mud covered the surface to a depth of from 4 to 12 ft. In other areas, the original ground consisted of adobe and clayed loam. Underlying practically the whole section is a layer of compacted clay including some strata of sand and gravel.

To remove the unsuitable material the contractor, Johnson Western Co. and American Pipe & Construction Co., used

three 1.5-cu. yd. floating clamshell dredges. These were floated into the working area at high tide on one of the drainage channels, and after arriving at the working site they dug themselves a basin and dammed behind themselves. Starting at this basin they worked the entire length of the project.

The bottom width of the roadway excavation was 100 ft. and the side slopes were 1½:1. The three clamshells worked as a team since no one had a boom long enough to cover the entire width and discharge on the banks. The center dredge dumped its material near the side of the excavation, where it was picked up by the other dredges and cast onto the bank. It was placed 5 or 10 ft. out from the top of the cut in order to prevent slipping back into the excavated section. After the mud had somewhat dried out, it was shaped into levees by draglines operating on timber mats, in order to serve as confinement walls for the subsequently placed hydraulic fill. About two-thirds of the excavated material was cast on the bay side of the right-of-way, where it will ultimately serve as a base for a 2-lane service road.

Hydraulic fill

A 323-ac. dredging area in the floor of the bay was approved by the War Department as a site for procurement of hydraulic fill material. The area was approximately 3,000 ft. wide and 6,380 ft. long located roughly 1,200 ft. west of Bay Farm Island. Borings by the Division of Highways laboratory forces indicated that there were considerable deposits of mud in some portions of the dredge area, but that other sections were completely free of mud and composed of well graded white sand. Dredging, therefore, was confined to these latter areas.

The dredge "Olympia" was assigned by the contractor to the task of supplying the hydraulic fill. It was 150 x 40 ft. in size and drew 9 ft. of water. In furnishing the fill, the dredge was operated 24 hr. a day, but closed down for maintenance and repairs on Sundays.



THE PUMP LINE from the dredge "Olympia" was 5 mi. long, most of it across Bay Farm Island. A booster pump on the dredge "Papoose" was used to facilitate movement of the material in the pipe. The "Papoose" dredged channel to reach pipe.

Digging was performed by a 5-blade basket type steel cutterhead, 6.5 ft. in diameter attached to an 86-ft. ladder, which was able to work to a depth of 50 ft., although in this particular project the War Department permit specified dredging to a depth of only 30 ft.

Dredging operation

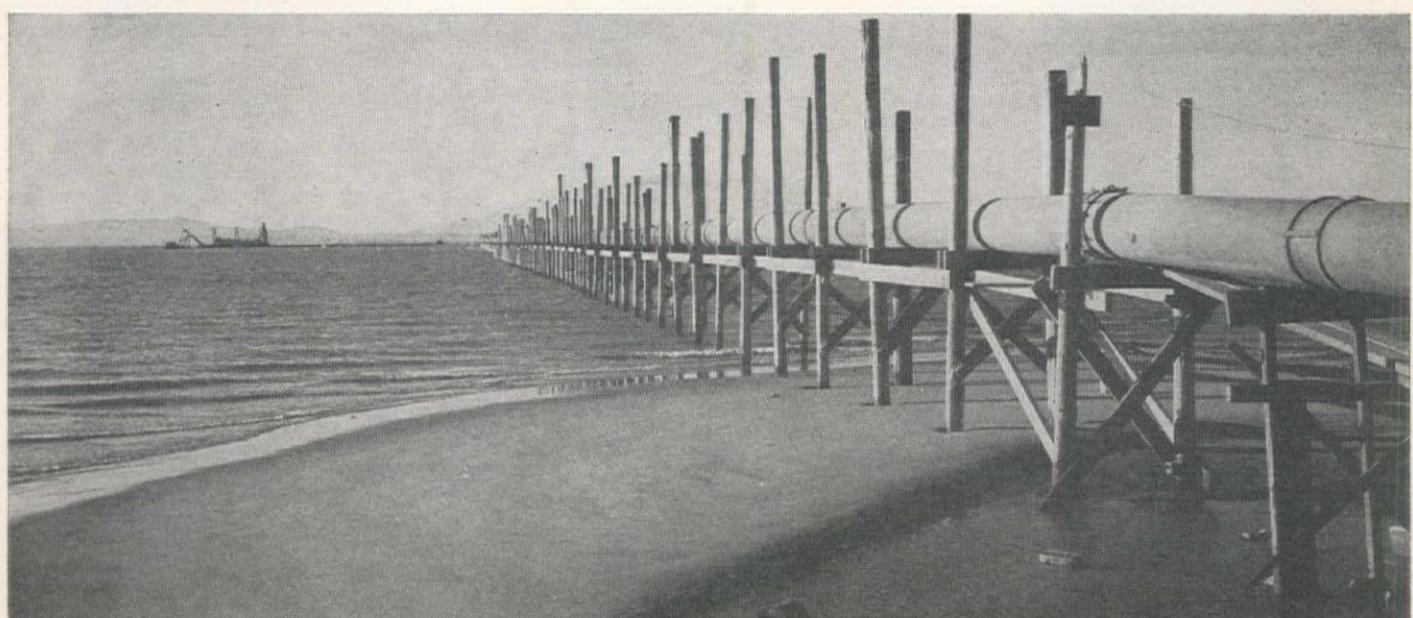
The dredging site was approximately 25,700 ft. from the roadway fill and the dredger pipe was carried for approximately 1,600 ft. on pontoons and for the rest of the way it lay on the ground across Bay Farm Island. A 76-in. pump, powered by a 2,500-hp. motor on the "Olympia" forced the dredged material into a 24-in. intake pipe which in turn

THE FIRST 1,600 ft. of the pump line was supported on pontoons, and several hundred feet across the shallow tidal flats was carried on this temporary trestle of pile and timber construction to solid ground.

discharged into a 30-in. pontoon line. A booster pump on the dredge "Papoose," powered by a 4,000-hp. motor, was located about 9,000 ft. from the suction dredge pumps. Since this point was within the bounds of Bay Farm Island, it was necessary for the "Papoose" to dredge a channel from the bay to the booster location. The dredged material was carried in 24- and 30-in. pipes and the line was passed under the several roads it crossed through 36- and 42-in. concrete pipes used as conduits.

A radio telephone was used for communication between the dredge and the booster pump during operation and a regular telephone line was installed between the booster pump and the placement area. Thus when any leak in the embankment levees or pipes was discovered it was possible to quickly set down operations by telephone message.

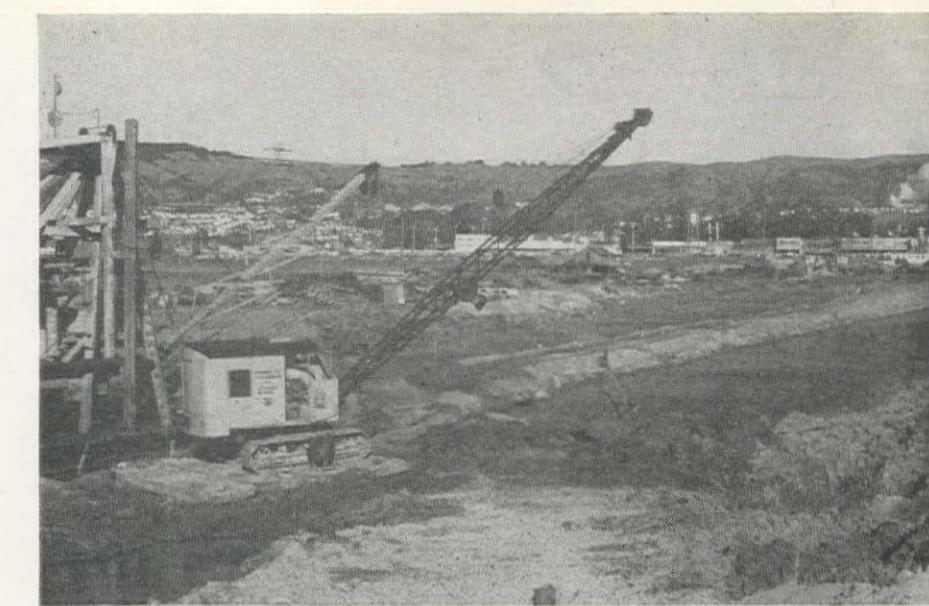
The excavation totaled 300,000 cu. yd. of saturated mud and clay and the hy-



draulic backfill amounted to 890,000 cu. yd., including overload. The fluid material furnished by the dredge line averaged about 12 per cent solids, and the dredge pumped approximately 700 cu. yd. of hydraulic fill in place per hour. The sand fill is remarkably even in texture, free from clay lumps or other irregularities, and with only rare and minute portions of shell.

An overload of additional embankment material was placed on the roadway to accelerate settlement. This additional material varied in thickness from 2 to 4 ft. above the final grade, the thickness being determined by the original soil survey information, the heaviest surcharge being placed at the points of deepest mud. Settlement records are being kept and the overload will be removed to grade line before paving begins. Whatever overload material is removed at that time will be used for a base on the contiguous service road. Only minor settlement has occurred on the basis of surveys to date and it is believed that little or no further subsidence will occur.

Additional work on the contract included the construction of numerous small ditches and channels to realign water courses which were disturbed by the new fill and to provide drainage for



DRAGLINE with 2.5-cu. yd. bucket, working from timber mat, and 1.5-cu. yd. clamshell floating dredge operating as a team in excavation of channel through marshland.

lands whose existing drainage channels were cut off. The three principal channel changes were Elmhurst Creek, Damon Slough, and East Creek Slough. In each of these cases bridges will be required.

SINGLE PIPE line from dredge entered the fill area at about the center, was routed each way through a wye, center of top picture. Completion of the first lift of hydraulic fill near Damon Slough, bottom, showing fine, clean, even texture of sand fill.



It is probable that contracts for the three structures will be let during the summer of 1948.

Organization

The project is being constructed under the supervision of George T. McCoy, State Highway Engineer and John H. Skeggs, Assistant State Highway Engineer in charge of the San Francisco District. R. P. Duffy is Assistant District Engineer, Operations, and F. W. Montell was resident engineer.

For the contractor, Johnson Western-American, L. J. Sullivan was general superintendent through most of the work, and C. R. McCoy was dredging superintendent. Charles Back was job engineer, Ed Kelling was excavation foreman and James Dofflemyer was office manager. Associated Dredging Co. was subcontractor on the clamshell excavation work.

Treatment Plant Property Acquired for Eastbay Sewers

TITLE TO THE PROPERTY for a sewage treatment plant site has been obtained by the East Bay Municipal Utility District. The property, consisting of 25 acres, lies between the Key System right-of-way and the Army Port of Embarkation, immediately south and west of the distribution ramp at the east end of the San Francisco-Oakland Bay Bridge.

This site will be the location for the screening chambers, digestion tanks and other facilities to provide the necessary treatment to the sewage before the liquid effluent is discharged into the Bay about 6,000 ft. off the end of the old Key Route fill. The property has been acquired at a cost of \$226,269.

First work to be done at the treatment plant site will be that of providing fill for the ground. It is expected that bids for this work will be advertised within a few weeks.

Portrait—A Future A. G. C. President

ADOLPH TEICHERT, JR., the newly-elected vice-president of the Associated General Contractors of America is an exceptionally modest man. When he received word of his nomination to this office, last Fall, his only comment was typical. "Golly," he said quietly, "I didn't know I had that many friends." Next year, if precedent is followed, he will be A.G.C.'s president.

Teichert is President of A. Teichert and Son, Inc., Engineering Contractors, of Sacramento, California, one of the oldest construction companies in the state. It was established in 1878 by his father, the first Adolph Teichert, only a few years after he had arrived in this country from Germany. Landing in New York, alone and almost penniless, the seventeen year old boy had sufficient initiative and experience to get work as a journeyman bricklayer. Afterward, he was employed by an artificial stone paving company, the first to separate squares of concrete with expansion joints instead of laying it in solid slabs (the old Schillinger Patent).

In 1875, the young man was sent to California to demonstrate this new technique and examples of his early work still exist, notably the driveway on the west side of the State Capitol at Sacramento (the first time, incidentally, that concrete was ever used as paving) and the sidewalk around the Hotel Mark Hopkins in San Francisco, which survived the earthquake of 1906.

Starting in the business

His son, the subject of this article, received his first scars in the construction game while still a youngster. They were achieved while sharpening the stakes used to hold down "headers" and are still visible between the thumb and forefinger of his left hand.

Undiscouraged by this prophetic introduction to a tough profession, young Adolph went on to the University of California at Berkeley, from which he was graduated in 1908, with a B.S. degree in Civil Engineering. Then he entered the family firm in partnership with his father, and since that time has had personal experience with almost every job the company has turned out.

In 1912, A. Teichert and Son constructed the third piece of highway in the state, in Santa Clara County, and Teichert says that he ran the outfit with a time book in his back pocket, acting as his own superintendent. There is a certain parallel between his career and that of another Californian, George Atkinson, recently discussed in these pages, and with whom Teichert is at present associated in joint ventures. Both men are carrying on flourishing businesses started by their fathers, and both are doing this more successfully than is sometimes the case.

All kinds of work

When this parallel is mentioned, however, Adolph Teichert characteristically

Adolph Teichert, Jr., president of A. Teichert & Son, is the newly-elected vice-president of the Associated General Contractors of America — He is noted for his integrity and modesty and has that most valuable of assets, "horse sense"

By BETTY THOMPSON
San Francisco, Calif.

points to what he considers an important distinction. "You might say that the Atkinsons take the big jobs and we take the little ones."

This is, of course, not entirely accurate. A. Teichert and Son have to their credit thousands of miles of highway, several airfields, the Sierra Ordnance Depot in California and a goodly assortment of dams. At present, they are engaged in joint ventures on the \$19,000,000 Harlan County Dam in Nebraska, and the \$7,000,000 Dorena Dam in Oregon, and are constructing the Mariposa Dam near Merced, Calif.

But it is also true that the firm, in the eyes of Sacramento, occupies somewhat the same position as that of the traditional family doctor. One minute the telephone will ring with a question concerning a million dollar contract. The next call is just as likely to be from Mrs. Smith, desiring the Teichert Company to put in a swimming pool for her.

Skill-Integrity-Responsibility

It is said that wherever Adolph Teichert has done a job, he can be sure of a welcome when he goes back. His absolute, unshakable integrity has become a

ADOLPH TEICHERT, JR.



byword. Recently, during a tour of some installations around Seattle, he picked up a brick and examined it. As the party moved on, Teichert turned back to replace the brick exactly where he had found it. Noticing this, one of the other contractors in the group gave a delighted shout. "Look at that! There's Honest Adolph for you." In fact, his friends say that the A.G.C. motto "Skill-Integrity-Responsibility," might have been especially tailored to apply to the new national vice-president.

He is regarded as a practical construction man in the best sense of the word, a man with that most valuable of assets, "horse sense." Associates also comment upon his powers of observation. Nothing is too small to escape his notice. He will walk through a yard, apparently engrossed in conversation, and an hour afterwards will be able to tell wherever there was a nut off a bolt, which piece of equipment needed greasing, and at what spot someone had left lying a pick-axe. The only place where this power of observation seems to fail is in his memory for names, which is frankly not good. To bolster it, he keeps a notebook filled with cryptic and cross-referenced jottings that would be undecipherable to anyone else but act as a jog when his memory starts playing tricks.

In appearance, Adolph Teichert is a slender, well-groomed, professional-appearing man, impeccably tailored and always immaculately clad. He even wears business clothes on a field trip, his only concession to rugged surroundings being a pair of heavy boots. He is genial, quick to laugh, and gets considerable pleasure out of life, plays golf in the low eighties and tries to get in a game at least twice a week. In addition, he and his wife enjoy dancing, and give famous barbecue suppers in the garden of their home. The latest addition to the family circle is a Welsh terrier, with the authentic name of Rhordri Mawr.

Citizenship activities

Teichert is exceptionally well and widely read, which may in part account for his sometimes uncanny ability to sense the trend of the times, an ability that stands him in good stead when it comes to business. His interest in national and international affairs is sufficiently great to prompt him to action, if he happens to disapprove of the course things are taking in Washington. When this occurs he writes pointed, and if necessary, repeated letters to the Congressmen concerned.

Another example of his good citizenship is the active part he has always taken in projects for the betterment of the community. He was one of the earliest supporters for the Port of Sacramento when this project, now being put into effect, was first discussed after the first World War. He is a past President of the Sacramento Chamber of Commerce, the Community Chest, Y. M. C. A., and Exchange Club and is at

present a committee member of the California State Chamber of Commerce, the Rotary Club and the several Masonic organizations. In spite of these various activities, he still manages to devote most of his extra-curricular time to the A.G.C., serving on several committees of the Northern California Chapter and as a member of the National Advisory Board which meets several times a year in various parts of the country.

Most construction men have a couple of jobs in their background that stand out, either as the "Most difficult" or the "Most interesting." To Adolph Teichert, the most interesting job is always "the one you're working on now," and although he's come up against plenty of tough going, he says that he cannot remember any difficulties extraordinary enough to write about.

The atmosphere around the yard is friendly, casual and informal, with no sense of pressure although work is obviously going on at top speed. There is a lot of equipment, and it is noticeable that it is all kept in top condition. Despite his friendliness, however, Adolph Teichert is always "Mr. Teichert" to his employees.

He has three children, A. H. Teichert, now living in New York, Henry, who is studying law at the University of California at Berkeley, and Nancy, still in high school, and a notable horsewoman. His other son, Frederick Q. Teichert, was well known in construction circles until his death in 1944.

Adolph Teichert's business and social activities give him a fairly full schedule, but there is still one club for which he is saving time, although he is not yet eligible to be numbered among the elect. This is Sacramento's exclusive Grandfather's Club, whose prerequisites for membership consist of one bottle of Old Granddad and at least one grandchild. To date he has carefully stowed away the first, and is now waiting hopefully for one of his offspring to present him with the other.

Great Increase in Energy Needs for Utah Predicted

ENERGY requirements of Utah's utilities will total 3,724 million kilowatt-hours by 1970, an increase of about 230 per cent over 1944, according to a report issued by the Federal Power Commission in cooperation with the Colorado River Committee of Utah. In addition, industrial plants in the state will generate a total of 763 million kilowatt-hours for their own use, making total energy requirements for the state about 4,487 million kilowatt-hours by the same date, the report adds.

This report foresees that as a result of the industrial expansion brought about by the war and the development during the war years of feasible plans for large-scale irrigation improvements, the industrial and agricultural growth of the state during the twenty-five years from 1945 to 1970 may surpass the development in any similar period of the state's history.

Funds Advanced by REA to Western States for Rural Electrification

LOANS APPROVED by the Rural Electrification Administration to Western borrowers for the purpose of financing construction of electric facilities for farm installations in recent weeks are listed below. The funds are to be used for such purposes as construction of transmission and distribution lines, construction or purpose of generating facilities and rehabilitation or improvement of existing facilities. The funds are to be repaid from receipts of the borrowing agency. Construction will begin as soon as necessary contracts can be drawn up and short materials are available.

California

To Plumas Sierra Rural Electric Co-op., Portola, \$185,000 for 25 mi. of transmission line.

Idaho

To Lost River Electric Co-op., Mackay, \$120,000 for 7 mi. of distribution line, system improvements and completion of previously approved construction; to Clearwater Valley Light & Power Assn., Lewiston, \$275,000 for system improvements and completion of present construction; to Idaho County Light & Power Co-op. Assn., Grangeville, \$150,000 for system improvements and completion of previous construction.

Montana

To Park Electric Co-op., Livingston, \$175,000 for completion of previously approved construction; to Flathead Electric Co-op., Kalispell, \$85,000 for 18 mi. of distribution line and system improvements; to Ravalli County Electric Co-op., Corvallis, \$150,000 for 45 mi. of distribution line.

Nebraska

Niobrara Electric Membership Assn., Hay Springs, \$300,000 for 226 mi. of distribution line and completion of earlier construction.

New Mexico

To Otero County Electric Co-op., Cloudcroft, \$450,000 for 156 mi. of distribution line, acquisition and rehabilitation of 3½ mi. of distribution line, and purchase of the generating plant of the Capitan Light & Power Co. at Capitan.

Oklahoma

To Red River Valley Rural Electric Assn., Marietta, \$450,000 to construct 264 mi. distribution line, headquarters facilities, system improvements, and previously approved work; to Caddo Electric Co-op., Binger, \$360,000 for 115 mi. of distribution line, a mobile generating unit and system improvements.

Texas

To Nueces Electric Co-op., Robstown, \$193,000 for 61 mi. distribution line, headquarters facilities, and completion

of previous construction; to San Patricio Electric Co-op., Sinton, \$310,000 for system improvements and 207 mi. of distribution line; to Lone Wolf Electric Co-op., Colorado City, \$50,000 for 35 mi. of distribution line; to Midwest Electric Co-op., Roby, \$105,000 for system improvements including 67 mi. of tie line; to McLennan County Electric Co-op., McGregor, \$280,000 for 157 mi. of distribution line, system improvements and for headquarters facilities; to the Kaufman County Electric Co-op., \$295,000 for 164 mi. of distribution line and system improvements; to J-A-C Electric Co-op. Assn., Bluegrov, \$126,000 for 93 mi. of line.

Utah

To Beaver Valley Electric Assn., Beaver City, \$12,000 for 5 mi. of distribution line.

Washington

To Stephens County Electric Co-op., Colville, \$195,000 for system improvements and completion of previously approved construction.

Construction Equipment Industry Is Optimistic

CONDITIONS in the construction equipment industry are better than at any time since before the war, according to a nationwide survey made by the Associated Equipment Distributors, whose members include manufacturers and distributors of construction equipment. The survey revealed a general optimism over prospects in 1948, but an optimism tempered by some uncertainty fostered by the possibility of diversion of materials or equipment for export under the European recovery program.

Deliveries of all construction equipment remain at a high level coincident with the undiminishing need for both public and private construction of all types. During the last year, the situation has changed from one of general scarcity to a fairly good balance between supply and demand. Most distributors report inventories are large in dollar volume, but they are not considered too heavy when measured in machine units.

With the possible exception of a few Western states, distributors foresee no drop in equipment sales in the immediate future. A decline of about 15 per cent has been noted in the California-Nevada-Arizona area. In Wyoming, Colorado, New Mexico and Utah sales are tending to level off and revert to a normal seasonal basis.

In about one-third of the states, trade-ins have increased 25 to 100 per cent in recent months, and buyers are said to be demanding excessive trade-in allowances. As deliveries continue to improve, distributors elsewhere expect to face the same problem within a short time.

Arizona Mechanics Invent Machine To Dig and Line Small Ditches Fast

"LINE DITCHES with concrete at the rate of a mile per hour? Nonsense!" That's what people told Revilo Fuller, Phoenix, Arizona, when he first began talking about his ideas. But young Fuller is not the type of man to give up easily, and late last December, at a field demonstration on his brother's ranch near Litchfield, Ariz., he proved that his "Fullerform" not only can do what he said it could, but also that it would accomplish the seeming miracle with a crew of just two men on the ditch; that the job could be done for considerably less cost than farmers were used to being charged for either cement spraying or plastering.

Observers of that first demonstration saw the Fullerform make one run of 232 ft. in a little less than five minutes, which included one stop caused by a delay in the delivery of mixed concrete. Everyone except Fuller, was amazed with the speed of the lining job, and also with the smoothness and perfection attained.

"We can work much faster than that," Fuller said. "The form is capable of handling 132 cu. yd. of concrete per hour. A yard will line 40 ft. of the size ditch being demonstrated here, so there's no reason why mile-an-hour lining can't be done."

The ditch in this case was the standard lateral which handles a 250-in. head of water. Its depth is 18 in. Across the top it is 48 in., and the flat bottom is 12 in. wide. The concrete lining is a minimum of 1½ in. thick.

Lean concrete mix

The concrete mixture used in the first test was 60% sand, 40% half-inch stone and four sacks of cement to the cubic yard. D. W. Kelly, Arizona Sand and Rock Co., says this lean mixture is generally considered best for this type of work because it is less apt to crack, but other mixtures are also being tried. No reinforcing of any kind is used on the ditch.

At least as surprised as the farmers who viewed that first demonstration run, were officials of the concrete mixing firm. They set up one of their mixers which has capacity to mix 40 cu. yd. of concrete per hour. To carry the concrete to the Fullerform as it moved along the ditch, they furnished two 7-cu. yd. capacity mixer trucks.

In light of past experience with ditch lining jobs, the Company thought they would always be far ahead of Fuller's demand. Actually in the first hour of work, mixing was so far behind that the lining machine was idle most of the time, waiting for the trucks to make the run of less than a city block.

Naturally Fuller was elated with the results of his first public test. For him it was the successful outcome of several months of hard work, and not a few

Plow-type digger which simultaneously levels track for following equipment grades four to five miles of ditch per day—Sliding hopper which feeds concrete onto ditch walls and at the same time trowels it into final finish, has been demonstrated to line small canals at the rate of a mile per hour

By RICH JOHNSON
Phoenix, Ariz.

disappointments. He had at first only a vague idea of how the Fullerform should be made. A graduate of Utah State Agricultural College, he had enough engineering background to understand the problems involved. He had also done some ditch lining by the old plastering method, and had experimented with various types of forms. However, to translate the Fullerform from a mental picture into a working model of steel, he needed help.

Getting that help was a real stumbling block until he met John Morgan. Morgan's reputation as a designer and fabricator of unusual agricultural implements has been growing rapidly since his floating reel hay rake hit the market in 1946. Fuller brought his problem to Morgan's Tolleson, Ariz., shops and laid it in his lap.

Form design

The form consists of a hopper mounted on steel plates which rest on the sides

REVIL FULLER and JOHN MORGAN, inventor and manufacturer of the novel ditch lining equipment, which is at once hopper, form, and trowel, stand at right watching the operation of machine during its first test on a farm at Litchfield, Ariz.



Western Association Officers—1948

A. S. C. E.

Arizona

G. L. McLane, District Engineer, Bureau of Public Roads, Phoenix, takes over as section president for 1948. **George W. Howard** is the new vice-president and **V. E. Larson** will continue as secretary-treasurer.

Colorado

Alfred J. Ryan is the new president of the Colorado Section. **Carl A. Gould**, former secretary-treasurer, takes over new duties as vice-president. **John S. Marshall** is the new secretary-treasurer.

Montana



Fred E. Thieme, regional forest service engineer for the U. S. Forest Service at Missoula has been elected president of the Montana Section, to replace **Paul M. Johnson**. **Edward H. Thomas**, bridge plans engineer for the State Highway Department, and **John S. James**, district engineer for the Soil Conservation Service, are the new vice-presidents. **Gordon K. Ebersole**, Chief of Surveys, Bureau of Reclamation, Canyon Ferry Unit, is the new secretary-treasurer.

New Mexico

President of this section for 1948 is **George J. Johnston** of Albuquerque. He is district engineer for the New Mexico Highway Department.

San Diego



M. J. Shelton, Assistant Manager and Engineer of the La Mesa, Lemon Grove and Spring Valley Irrigation District is the new president of this Section. **Richard S. Holmgren**, Assistant to the Chief Engineer of the San Diego County Water Authority is new vice-president. **J. F. Jorgenson**, Associate

Highway Engineer for the State Division of Highways, takes over new duties as secretary-treasurer.

Tacoma

John L. Stackhouse, assistant construction engineer for the Washington State Highway Department, has been elected president of the Tacoma Section. For 1948, the officers of the section in addition to Stackhouse will include **Arthur Johnson**, vice-president; **Frederick D. Langdale**, secretary-treasurer; and **Roy L. Greene**, director to serve a 3-yr. term.

Oregon

Glen S. Paxson, bridge engineer for the Oregon state highway commission at Salem, has been elected president of the Oregon Section. Other officers of the sec-

tion for this year include **T. W. Ragsdale**, Portland, first vice-president; **Robert E. Cushman**, Portland, second vice-president; **Guy H. Taylor**, Portland, secretary; and **George E. Hyde**, Portland, treasurer.

Los Angeles



Ray L. Derby, Assistant Sanitary Engineer for the Los Angeles Department of Water & Power, presides as president of the Los Angeles Section for 1948. **D. Lee Narver** and **Arthur G. Pickett** have been named as the vice-presidents. **George E. Brandow** of Brandow & Johnson continues as the

secretary, with **Robert J. Kadow** taking over new duties as treasurer. **Charles R. Compton** and **Wallace L. Chadwick** are past presidents of the organization.



San Francisco

L. A. Elsener is the new president for this section. He is district sales manager for the Chicago Bridge & Iron Co. **A. W. Earl** and **Glenn B. Woodruff** are the new vice-presidents, and **J. E. Rinne** continues as the secretary-treasurer.

Spokane

Harold J. McCoy has been elected president of this section. Other officers who will serve during 1948 include **Allen S. Janssen**, first vice-president; **L. V. Douns**, second vice-president and **William A. Hill**, secretary.

Sacramento



A. G. Mott, Director of the Valuation Division of the California State Board of Equalization, ascends to the presidency of the Sacramento Section. **Henderson E. McGee** and **Edwin F. Sullivan** take over as first and second vice-presidents, respectively. **F. W. Robinson** continues in his capacity as secretary-treasurer.

Intermountain

Erwin U. Moser, Resident Engineer of the Utah State Aeronautics Commission, Salt Lake City, is 1948 president for this section. Vice-presidents are **Milton T. Wilson**, District Engineer, U. S. Geological Survey, Salt Lake City, and **David E. Benton, Jr.**, Consulting Engineer, Salt Lake City. **Carl E. Painter** is secretary-treasurer for the section and **Frank R. Randle** is assistant secretary.

Seattle

Bertram P. Thomas was elected presi-

dent of the Seattle Section. Other officers of the section this year include **E. L. Strandberg**, vice-president; and **Thomas H. Campbell**, who was re-elected secretary-treasurer.

A. G. C.

Arizona Chapter



Porter W. Womack, Womack Construction Co., Phoenix, Ariz., is the new president of the Arizona Chapter of the Associated General Contractors of America. **W. E. Orr, Jr.**, partner in the Orr and Orr Construction Co., Phoenix, is the vice-president. **L. G. Vinson**, Vinson Construction Co., Phoenix,

was elected director for the three year tenure of office. Other members of the board of directors are **M. O. Packard, Jr.**, **Edward O. Earl** and **D. W. Kelley**, who was re-appointed treasurer. **Joseph P. Condrey** is executive secretary for the Chapter.

Idaho Branch

William Hoops, Jr., is the 1948 president for the Idaho Branch, A.G.C. **W. R. Cahoon** is vice-president and **L. D. Robbins** is secretary-treasurer. The board of directors includes **Paul Wise**, **L. L. Wheeler** and **Edgar F. Lessinger**.

Nevada Chapter

A. D. Drumm, Jr., is the 1948 president for the Nevada Chapter, A.G.C. **Ludwig Flyge** and **E. E. Games** are the vice-presidents. **C. V. Isbell** is treasurer. **Charles L. Hill** is secretary-manager for the Chapter and **Lyell Kofoed** is assistant secretary.

Denver General Contractors Association, Inc.

George B. Folsom, Jr., Folsom Construction Co., is 1948 president for the Denver General Contractors Association, Inc., associated with A.G.C. **James R. Howell**, of the company of the same name, is vice-president. **David A. Olsom**, firm name also the same, is secretary, and **Gerald H. Phipps**, Platt Rogers, Inc., is treasurer. **E. B. Tarpley** is secretary-manager for the Association. The board of directors includes **Roger B. Mead**, **J. A. Schrepferman**, **N. G. Petry**, **E. B. Jones, Jr.**, and **James B. Kennedy**.

Montana Chapter

Dan Mooney, Butte, Mont., has been elected president of the Montana Contractor's Association, chapter of the A.G.C. **George Nilson**, Great Falls, has been elected vice-president; and **Ed O'Neil**, Havre, treasurer. Directors of the association include **L. W. Lockwood**, Glasgow; **M. H. Archibald**, Sheridan, Wyo.; **E. W. McLaughlin**, Livingston; **Morris O'Brien**, Great Falls; and **L. M. Sheridan**, Butte, retiring president.

Montana Building Chapter

Floyd Pappin, Great Falls, has been elected president of the Montana Building

Chapter of the A.G.C. Other officers of the Chapter include Charles Pew, Missoula, vice-president; and William Lowe, Billings, treasurer. Directors include E. A. Dalakow, Helena; Wilbur L. Graham, Kalispell, and Don A. McKinnon, Helena, retiring president.

Mountain Pacific Chapter

Wayne Sutton of the Washington Asphalt Co. has been elected president of the Mountain Pacific Chapter, A.G.C., Seattle. Officers for 1948 in addition to Sutton include Paul Jarvis, vice-president; and W. J. Pierce, treasurer. Chapter members on the board of trustees for the year include Paul Fiorito, retiring president; Elmer J. White, Cotton R. Wilcox, J. F. Beardsly, Paul G. Ellis, Gil Griffen, Don L. Cooney, Ivan Bruensbach, J. W. Hardison, T. H. Youell, C. V. Wilder, and Joe A. Denn.



SUTTON



WARRACK

Seattle Chapter

J. B. Warrack of J. B. Warrack Co., Seattle, is the new president for this Chapter of A.G.C. Warrack was the first president of the Chapter 25 years ago, and again takes over that post for 1948, the 25th year of the Chapter's existence. James Cawdrey, Henrik Valle Co., Inc., is the first vice-president, and Elmer Edwards, Manson Construction & Engineering Co., is the second vice-president. P. D. Koon was elected as secretary, and Cliff Mortensen is the treasurer.

James B. Warrack died in his sleep Feb. 18 while enroute home from the A.G.C. National Convention in Dallas. The unexpected death of this master of building construction and molder of good ideas is a great loss to the entire Pacific Northwest.

Oregon Building Congress

Fred W. Eichenlaub, retired chief engineer of the Portland Wire & Iron Works, Portland, has been elected president of the Oregon Building Congress. Other new officers for the year include H. P. Davidson, vice-president; Roy C. Hill, secretary; Donald W. Edmundson, treasurer; and R. M. Robson, Harry Heuer, Fred W. Manash and Warren E. Fitch, Jr., all directors.

Colorado Contractors Association

J. H. Monaghan, of J. H. - N. M. Monaghan & Associates, continues as president of the Colorado Contractors Association, affiliated with the A.G.C. Don G. Bell, of Peter Kiewit Sons' Co., Denver, is the first vice-president. C. L. Hubner of the C. L. Hubner Co., is the second vice-president. Walter Steinwald of the Colorado Constructors, Denver, is the new secretary-treasurer. Members of the board of directors include Morris Adelstein, Glen E.

Blanchard, Carroll Brous, Ed. H. Honnen, A. S. Horner, James B. Kenney and Zimme Lowdermilk. Earle W. Devalon is the managing director of the association.

Southern California Chapter

J. A. McNeil of the J. A. McNeil Co., Inc., was elected unanimously as president of this Chapter of A.G.C. He succeeds M. F. Kemper. Other officers elected to serve in administering the affairs of the Chapter for 1948 include vice-presidents Thomas Paul of Peter Kiewit Sons' Co.; Edward Green of Edward Green Co.; and J. A. Thompson of J. A. Thompson & Sons. A. L. "Bud" Pozzo of Pozzo Construction Co., Ltd., was re-elected treasurer. Elected to fill the vacancies created by those directors whose term of office had expired were W. W. Hoagland, Claude A. Fisher, Donald E. Reed and B. M. Laulhere. Retiring directors were R. F. Rasey, John MacLeod, Stanley Ball and G. W. Abernathy. W. D. Shaw is the Chapter manager.

Northern California Chapter

Al Biasotti of Louis Biasotti & Son, Stockton, is the 1948 president of the Northern California Chapter, A.G.C. Gordon H. Ball of N. M. Ball Sons, Berkeley, is vice-president, and H. Earl Parker of H. Earl Parker, Inc., Marysville, is treasurer. Other members of the board of directors for the Chapter are George H. Atkinson, Talbot D. Bailey, Charles L. Harney, George C. Loorz, H. C. Maginn, B. F. Modglin, Robert N. Pomeroy, A. G. Raisch and William A. Reardon. Winfield H. Arata is the secretary-manager for the Chapter.



BIASOTTI

BARKER

Intermountain Chapter

Ellis W. Barker, Ellis W. Barker Co., Salt Lake City, was elected president of the Intermountain Branch, A.G.C., to replace Grant Thorn of Springville. Carl E. Nelson, Logan, was elected vice-president. G. M. Paulson, Salt Lake City, was re-elected secretary-treasurer. W. W. Gardner, Ed Dorland and Mark B. Garff were elected directors. Carry-over directors for the chapter include Pat Gibbons, Ed Clyde, Perce Young and Grant Thorn.

Spokane Chapter

N. A. Degerstrom is president of the Spokane Chapter, A.G.C., for 1948. R. W. Meighan and Max J. Kuney, Jr., are the vice-presidents. The board of directors includes R. L. Bair and F. L. McAtee. Verne Warren is secretary for the Chapter.

San Diego Chapter

W. E. Kier was elected president of the San Diego Chapter, A.G.C., at the annual

meeting held Jan. 8. R. S. Seabrook was named vice-president. Directors of the chapter include J. H. Chambers, D. B. Clarke, B. R. Hazard, W. E. Kier, C. A. Larson and R. S. Seabrook. M. A. Mathias is Chapter manager.

Portland Chapter

Marshall R. Newport of the Newport Construction Co., Portland, has been elected president of the Portland Chapter of the A.G.C. Other officers of the Chapter for this year include Ray H. Northcutt, first vice-president; Karl F. Jacobsen, second vice-president; and Frank Lyons, secretary-treasurer. Members on the board of directors, in addition to the officers, include Donald W. Hall, Louis A. Peacock, S. S. Montague, G. E. Kibbe, H. A. Kuckenberg, J. R. Wininger, George W. Lind, M. J. Lynch, Harry A. Dick, H. G. Palmberg, C. A. Schram, and F. H. Slate.



Other Groups

Colorado Engineers Society

Lawrence M. Robertson is the new president of the Colorado Society of Engineers. He is an official of the Public Service Co. of Colorado. C. E. Dahlquist, of the Stearns-Roger Manufacturing Co., is the elected vice-president, and C. M. Lightburn of the Denver & Rio Grande Western Railroad Co. is the secretary-treasurer. Robert Curtis, Assistant Superintendent of the Denver sewage disposal plant, is the newly elected director.



Denver Association of Home Builders

T. A. Hutchinson has been elected president of the Denver Association of Home Builders. Other officers elected were Harold F. Higgins, chairman of the board; Alec J. Johnson, vice-president; Keppel Brierly, secretary-treasurer, and E. L. Dobbs, Gordon Johnson, C. O. Robertson, Forrest Ross and J. H. Morris, directors. Stanley A. Brandenburg was retained as executive vice-president.

Nevada Professional Engineers

L. J. H. Smith of Henderson has been elected president for 1948 of the Nevada Society of Professional Engineers to succeed A. J. Shaver of Boulder City. Other officers of the Nevada society are George Maxey of Ely, first vice-president; J. H. Buehler of Pioche, second vice-president; J. A. Tiberti of Las Vegas, third vice-president; A. T. Newell of Henderson, secretary, and R. T. Campbell of Henderson, treasurer.

The southern Nevada chapter of the organization also elected new officers with C. G. Petrie of Las Vegas returning to office as president, Harlan Brown was elected vice-president; Harry Hall, secretary-

treasurer and Frank Rathburn, Sr., and George Von Tobel, trustees.

Reno Engineers Club



Ernest McKenzie, who has his own engineering business in Reno, is the 1948 president of the Reno Engineers Club. Neil Plath, Sierra Pacific Power Co., is the vice-president, and Bill McCabe of the same company is the secretary - treasurer. The board of directors includes Edward Pine, Washoe County Engineer's office, and John H. Roberts, contractor.

Idaho Engineers Society

Orland C. Mayer, engineer with the Idaho Power Co., Boise, has been elected president of the Idaho Society of Engineers at the 38th annual meeting of the society in Boise during January. Other officers include Allen S. Janssen, Moscow, vice-president; James L. Morris, Boise, secretary; and Archie L. Biladeau, Boise, treasurer. Members of the society attending the meeting approved affiliation with the National Society of Professional Engineers.



Nevada Civil Engineers

Fred W. Clayton, consulting engineer, is the new president of the Associated Private Civil Engineers of Nevada. **John E. Curran**, civil engineer, is secretary-treasurer. **W. A. Wentz**, Humboldt County Surveyor, is vice-president of the organization.

Seattle Master Builders

V. O. Stringfellow has been elected president of Seattle Master Builders for 1948. Other officers to serve with Stringfellow include **Harold Raber**, vice-president; **Harold Wilkinson**, secretary; **Chester Betcher**, treasurer; and **Maury Setzer**, **Lew Hykes**, and **Lars Boyd**, trustees. Stringfellow, Archie Iverson and Stanley Long were elected local representatives to the National Association of Home Builders.

Oregon Professional Engineers

Carl E. Green, member of the firm of John W. Cunningham & Associates, Portland, was elected president of the Professional Engineers of Oregon in the annual state-wide election. Other officers of the group include **J. T. Hood**, vice-president; and **W. M. Allen**, Portland; **W. C. Hill**, Salem; and **D. B. Ambler**, Waldport, trustees.

Spokane Professional Engineers

Howard Stingle, engineer with the Washington Water Power Co., has been elected president of the Spokane chapter of the Washington Society of Professional Engineers. Other officers of the chapter include **Robert E. Tobin**, vice-president; and **William Connolly**, secretary. **J. G. McGovern**, dean of engineering at Gonzaga University and retiring president of the chapter, will serve as state representative.

Seattle Engineers Club

Ralph F. Dreitzler, manager of the West Coast Wood Preserving Co., has been elected president of the Seattle Engineers Club. Other new officers elected for the year include **O. I. Hall**, vice-president; and **Allen Hitchings**, treasurer. **Evans K. Blackford** has been re-elected secretary. The board of trustees this year will include **Robert L. Durham**, **Harold D. Fowler**, **B. B. Wills**, and **J. D. Taylor**.



DREITZLER

BLUME

Northern California Structural Engineers

John A. Blume, consulting structural engineer, is the new president of the Structural Engineers Association of Northern California. Other officers elected were **Jesse Rosenwald**, vice-president; and **A. W. Anderson**, **Henry J. Degenkolb** and **John E. Rinne**, directors. **George E. Solar**, Jr., is secretary for the association, and **Franklin P. Ulrich** is treasurer.

Southern California Structural Engineers

Steve Barnes, structural engineer in Los Angeles, was elected 1948 president of the Structural Engineers Association of Southern California. **Harry W. Bolin**, principal structural engineer of the State Division of Architecture, was elected vice-president and **Lewis K. Osborn**, designing structural engineer of Kistner, Curtis & Wright, is the new secretary-treasurer. Members of the board of directors are **Richard W. Ware**, **George E. Brandow**, **L. T. Evans**, **Harold P. King** and **Donald F. Shugart**.

Central California Structural Engineers

L. C. Hollister, former vice-president of the Structural Engineers Association of Central California, is the 1948 president. **A. A. Sauer** is the new vice-president. **D. C. Willett**, **A. H. Brownfield** and **R. W. Hutchinson** have been elected as directors.

Southern Oregon Professional Engineers

Edward N. McKinstry, Grants Pass, Ore., has been elected president of the Professional Engineers Club of Southern Oregon. **Francis Hart**, Medford, will serve the organization as vice-president; and **Ray Cruden**, Grants Pass, has been elected as secretary-treasurer.

Puget Sound Engineering Council

Fairman B. Lee, mechanical engineer of Seattle, has been elected chairman of the Puget Sound Engineering Council, co-ordinating organization of 21 engineering and technical societies in the area. Other officers of the Council for this year include **Lloyd N. Robinson**, vice-chairman; **Le-**

uel B. Cooper, secretary; and **Albert E. Nickerson**, treasurer.

Tacoma Engineers Club



J. Lester Sharp, chief draftsman, Weyerhaeuser Timber Co., has been installed as 1948 president of the Tacoma Engineers Club. Other officers include **Carl F. Pflugmacher**, first vice-president, and **Walter J. Ryan**, second vice-president. **David Countryman**, Civil Engineer, Douglas Fir Plywood Association, secretary-treasurer and **W. D. Whinery, Jr.**, member of the executive committee.

Utah Building Construction Congress

Raymond J. Ashton was elected president of the Utah Building Construction Congress. Other new officers are **R. L. Irvine**, vice-president, and **Gilbert W. Williams**, secretary-treasurer.

San Jose Engineers Club



Alvin F. Lowe, Engineer with the Pacific Telephone and Telegraph Co., is 1948 president of the Engineers Club of San Jose, Calif. **G. Walter Hunt**, Chief Engineer with the Santa Clara Valley Water Conservation District, is honorary president. **Edgar C. Shott**, Santa Clara City Engineer, is

vice-president. **J. Robert Roll** is secretary-treasurer. New directors are **Thomas F. Rogers**, **Russell J. Brady** and **George L. Sullivan**. Holdover directors are **Harry C. Darling**, **Lloyd J. McReynolds** and **Joseph J. Byrne**.

Seattle Construction Council

Harry Farrington was elected president of the Seattle Construction Council at the first meeting of the newly elected board of control. Members of the board also elected **Ed Saberhagen** as vice-president, **R. D. Lane** as treasurer, and **Frank Hardy** as secretary.

Ventura Engineers Club

Dr. Thomas L. Bailey, consultant geologist, is the 1948 president of the Ventura Engineers Club. **Vern M. Freeman**, engineer and manager of the Santa Paula Water Works, is vice-president and **R. L. Stump**, principal engineer in the office of the County Surveyor, Ventura, is secretary-treasurer.

Great Falls Contractors' Association

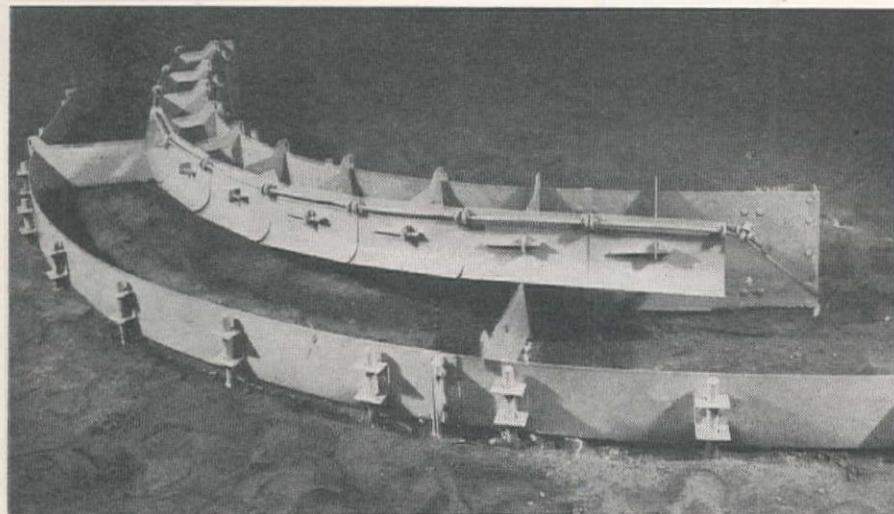
Guy Huestis, Jr., president of the Falls Construction Co., Great Falls, Mont., has been elected president of the Great Falls Contractors' Association. **J. D. Cave** was elected vice-president, and **Gorden Gens** was re-elected secretary-treasurer.

Wenatchee Contractors' Association

A. A. Vandivort has been elected president of the newly organized Wenatchee Contractors' Association. **H. F. Willet** will serve as vice-president; **Earl Cusick**, secretary; and **Charles Webb** and **James Goodfellow**, trustees.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD



Articulated Forms Simplify Work of Forming Radius Curbs and Gutters

A NEW TYPE of articulated flexible steel face forms for curb and gutter construction are now being manufactured and marketed. The new forms simplify the work of forming a battered curb face and accommodate any reasonable size radius.

The construction of combined concrete curb and gutter has always presented the contractor with the problem of providing suitable forms for not only the tangent work, but also for the radius returns at driveways and street intersections, and also on curved parkways. Fixed radius forms and face forms are economical only when there are many repetitions of the same size radius.

Since standard flexible steel forms cannot be used on a battered curb face on radius, many contractors construct face forms of wood at great expense or operate without face forms. When operating without face forms, the concrete must be very low slump and is literally tamped into place and shaped with the aid of a template or "mule."

The flexible steel forms present a new approach to the problem. They consist of straight, rigid sections one foot long, all identical. A 10-ft. length is made up of ten such sections and a 5-ft. length is made up of five sections.

The sections are assembled onto a steel cable, the cable passing through eyelets welded to the one-foot sections at both ends. Attached to one end of the cable is an I-bolt which ties to the outside eyelet of one of the end sections. The opposite end of the cable is simply anchored to the opposite end section with a cable clamp.

For the back of the curb and for the

face of the gutter, standard flexible steel forms are used and set in the usual manner. Each section of articulated flexible face form is keyed to a dividing plate after which the slack in the cable is taken up. The dividing plates are then given a final adjustment if necessary.

The form sections being straight and rigid, the setting results in a series of short chords. It is necessary to eliminate these chord marks and finish the face of the curb to a true arc. This, however, is considerably simpler than the work required to form the face of the curb by alternative methods.

Extra lengths of cable make possible the addition of more sections. The articulated forms thus accommodate any size of radius, and the contractor has the advantage of a complete steel form set-up for radius curb and gutter work where the face of the curb is battered. The forms are being marketed by the Blaw-Knox Co., Pittsburgh, Pa.

Brazed Pipe Fittings Eliminate Thread Need

A THREADLESS malleable pipe fitting, the first such fitting made for brazed pipe joints, has been developed and manufactured by Stanley G. Flagg & Co., Inc., Philadelphia, Pa. The revolutionary fitting makes it possible to join steel or wrought iron pipe without threads and without welding by a brazing method any competent pipe fitter can use. The new joint enables use of plain end pipe, eliminating the thread cutting which would otherwise weaken the pipe wall by reducing its thickness.

The fitting is a black, malleable iron socket type for brazing to steel or wrought iron. The cup of the fitting is reamed to accommodate the outside diameter of standard pipe and also to produce a shoulder or stop for the pipe when it is inserted.

The technique is best described by enumerating the steps employed. They are: cut pipe square; size end of pipe to proper clearance; insert pipe into fitting hard against the bottom of the pipe; heat the pipe until the flux is "working"; switch the flame to the fitting and heat until the flux is entirely melted and active; apply the suitable alloy and heat both the pipe and the alloy until the alloy flows by capillary attraction into the clearance between the cup and the pipe wall.

The method is recommended for boiler feed lines, lubricating oil piping and gas and air piping among others. It is especially applicable where vibration and inaccessibility make screwed pipe inadvisable.

CRANE with an 80-ft. boom hoists a towering smokestack into place. The scene is at the Burke Millwork Co. in Seattle, Wash. McRae Bros. Construction Co., Seattle, are owners of the 20-ton Lorain Moto-Crane, a truck-mounted crane with great mobility.



Construction Design Chart

XCIII... Flow of Water in Corrugated Pipe

NO ONE WOULD argue that corrugated metal pipe was particularly efficient as to flow characteristics due to the obvious fact that the irregular surface results in turbulence. There are, however, many cases where the overall cost makes it a logical choice even though it may be necessary to use a larger pipe section as compared to that of other materials. This is particularly true if transportation is an appreciable factor since corrugated metal pipe is relatively light in weight and is easy to handle. The accompanying chart for the flow of water in corrugated metal pipe is a companion chart to those for the flow of water in pipes of other material.

As a result of numerous published test data on the flow characteristics of corrugated metal pipe, the choice of $n = 0.021$ as a coefficient of roughness for use in the Manning formula, would seem to be representative of average results. The accompanying chart was plotted from data listed in Table No. 54 to be found in *Handbook of WATER CONTROL*¹. The results in this table are based on computations by the Manning Formula:

$$V = \frac{1.486}{n} R^{2/3} S^{1/2}$$

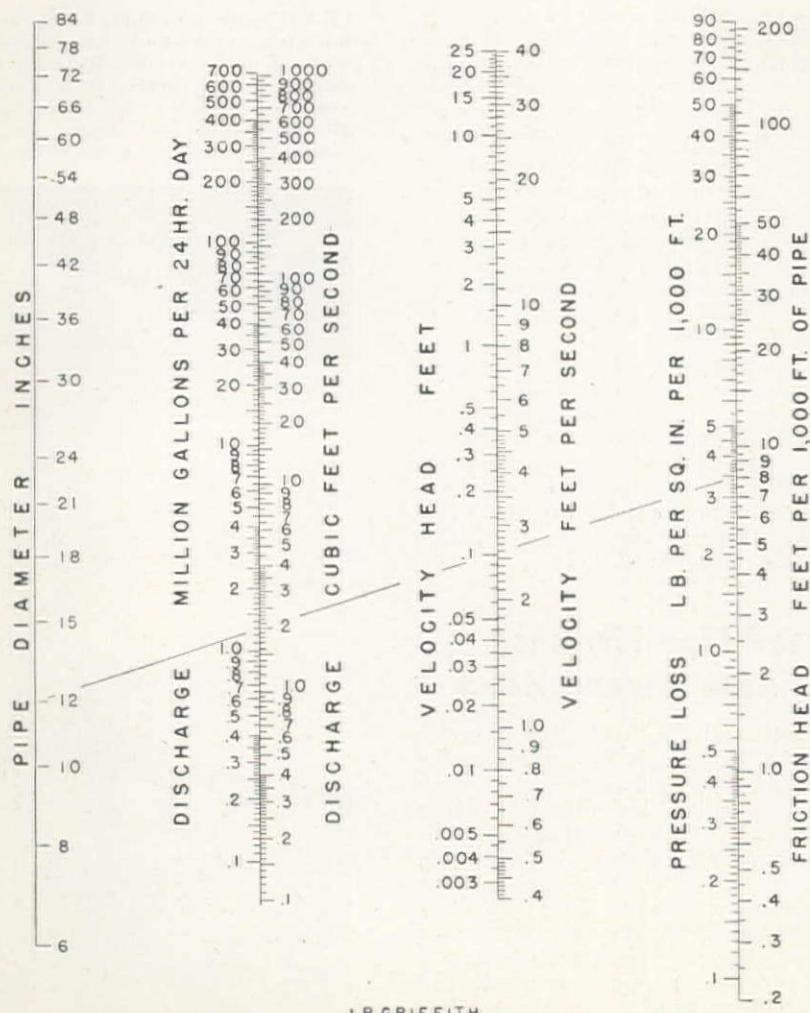
$$n = 0.021$$

gated metal pipes, the choice of $n = 0.021$ as a coefficient of roughness for use in the Manning formula, would seem to be representative of average results. The accompanying chart was plotted from data listed in Table No. 54 to be found in *Handbook of WATER CONTROL*¹. The results in this table are based on computations by the Manning Formula:

FLOW OF WATER IN CORRUGATED METAL PIPE

MANNING FORMULA $V = \frac{1.486}{n} R^{2/3} S^{1/2}$

COEFFICIENT, $n = 0.021$



By JAMES R. GRIFFITH
Civil Engineer
Seattle, Wash.

A chart which was published in the July, 1947, issue indicates the flow of water in cement-asbestos pipe. Since this material represents probably the lowest coefficient of roughness, it was thought to be a logical choice by which to compare results. In the problem used to illustrate the application of the chart for cement-asbestos pipe, the following conditions are assumed:

Pipe diameter, $D = 14$ in.

Friction head, $h_f = 5.0$ ft. per 1,000 ft.

The solution line on that chart gives for these assumed conditions, a discharge of

$$Q = 5.2 \text{ c.f.s.} = 3.4 \text{ m.g.d.}$$

If the reader will draw a solution line on the accompanying chart for the same discharge and loss of head, it will be seen necessary to adopt a pipe larger than 18 in. in diameter, as compared to the 14-in. cement-asbestos pipe.

In order to check the accuracy of the chart for corrugated metal pipe, I have drawn a solution line for the assumed conditions:

Pipe diameter, $D = 12$ in.

Discharge, $Q = 2.0$ c.f.s.

The following values will be noted on the scales for respective values:

Discharge, $Q = 1.3$ m.g.d.

Friction head, $h_f = 8.0$ ft. per 1,000 ft.

Pressure loss, $p_f = 3.5$ p.s.i. per 1,000 ft.

Velocity, $V = 2.58$ ft. per sec.

Velocity head, $h_v = 0.1$ ft.

Table No. 54, previously referred to, gives a loss of head in corrugated metal pipe of 0.80 ft. per 100 ft. of pipe under a discharge of 2.0 cu. ft. per sec. This checks the value obtained from the chart. Then by computation we have the following:

Discharge, $Q = 2.0 \times 0.646 = 1.29$ m.g.d.

Pressure loss, $p_f =$

$$8.0 \times 0.4335 = 3.47 \text{ p.s.i. per 1,000 ft.}$$

$$\text{Velocity, } V = \frac{Q}{A} = \frac{2.0}{0.7854} = 2.55 \text{ ft. per sec.}$$

$$\text{Velocity head, } h_v = \frac{V^2}{2g} = \frac{2.55^2}{64.4} = 0.101 \text{ ft.}$$

On the accompanying chart, only those sizes commercially obtainable are shown.

¹Armeo Drainage and Metal Products, Inc.

Nevada Alone in Putting All Gas Tax on Highways

NEVADA IS THE ONLY state in the Union which has not diverted funds from highway construction purposes to other uses, according to a report issued at Washington, D. C., by the National Highway Users Conference. Diversion of these funds to other purposes is forbidden in Nevada by a constitutional amendment approved at the general election of 1940.

In its drive to have taxes levied against highway users repealed or used entirely for highway construction purposes, the Conference charged that more than two billion dollars was diverted in other states in the 22-yr. period from 1924 to 1946.

NEWS OF WESTERN CONSTRUCTION

MARCH, 1948



Arizona Dams Found Safe by Board of Impartial Engineers

STEWART MOUNTAIN and Horse Mesa Dams, owned by the Salt River Valley Water Users' Association of Arizona, both of which were condemned two years ago in a report issued by the Bureau of Reclamation, have been found in safe structural condition by an impartial board of engineers.

Built in 1927 and improved in 1937, Horse Mesa Dam cost at that time \$5,248,000. Stewart Mountain Dam was erected in 1930 and improved in 1937. It and the power plant cost approximately \$3,000,000. Replacement today would cost twice these sums.

The Bureau's report was made in January, 1946, condemning both structures as unsafe for operation. The Water Users' Association was not satisfied that this was a correct evaluation. As a result, a board of engineers was agreed to

by both parties to make a thorough investigation of the dams.

The engineers individually and collectively made several trips during the last two years to the dams and outlined a program of exploratory examination work, including test borings into the core of the dams.

Horse Mesa Dam was cleared with a statement by the engineers: "The dam is at present safe and capable of maintaining its designed head continuously. The margin of safety in the concrete of the dam, as evidenced by lack of cracked areas, and as shown by the tests of cores taken, appears ample to warrant reservoir operation with the water at the top of the spillway gates at all times."

Stewart Mountain Dam was found to have experienced excessive internal expansion, due to alkali-aggregate re-

action. This reaction still is in progress, but evidently is limited to the upper 85 ft. of the structure. Some of the expansion and contraction joints in the dam, which were placed there when it was poured, have opened up and permitted some leakage through the structure. Engineers leave such a joint in a "green" structure to allow for the displacement as the concrete hardens and dries out.

The engineers found "the concrete in the portion of the arch in which expansion occurred has suffered no substantial deterioration and possesses strength sufficient to withstand stresses to which it is subjected with a wide margin of safety; that in the left thrust block and adjoining gravity section there is definite evidence of movement, indicating a lack of stability and a need of reinforcement."

The board recommended whitewashing the downstream face of the dam to deflect heat, thus diminishing expansion because of temperature changes, the grouting of the contraction joints to prevent further seepage through the structure and water-proofing the up-

CASCADE DAM IN IDAHO AS FINAL TOUCHES OF CONSTRUCTION ARE APPLIED BY CONTRACTORS

CASCADE DAM, Bureau of Reclamation structure erected on the North Fork of the Payette River in Idaho by Morrison-Knudsen Co., Inc., of Boise, is now completed and irrigation from its stored waters will commence this spring. The earthfill structure is 85 ft. high, 550 ft. long at the base and 700 ft. long at the

crest. Storage in the 21-mi. reservoir will irrigate 25,000 ac. of new land and supply supplemental water to some 83,500 inadequately watered acres in the fertile Emmett Valley. At the time this picture was taken embankment work had been completed and the spillway was being rapidly finished up.



stream face for a distance 75 ft. down from the top and reinforcing of the left thrust block to reduce the slide factor.

O. L. Norman, general manager of the Water Users' Association, said that grouting is now being carried out under Bureau of Reclamation supervision, and that waterproofing has not been done because of exhaustive experiments to

determine the best suited material for the job. He also stated that whitewashing will be done soon and that plans for the thrust block are being prepared.

Those on the engineering board were Raymond E. Davis, University of California; Herbert S. Crocker, Denver; Byram W. Steele, Arlington, Va.; J. D. Justin, Philadelphia and Ivan M. Houk, Denver.

Continuous Ramp Parking Garage Is Planned for Downtown Los Angeles

GENERAL PETROLEUM Corporation has announced plans for the construction of a radically new type of self-parking garage at Eighth and Flower Streets in downtown Los Angeles.

The new structure will park 446 cars and will be operated in conjunction with the new General Petroleum office building now being erected two blocks away on the corner of Wilshire Blvd. and Flower St.

Designed by architects Walter Wurde-man and Welton Becket, the new garage has been specifically planned to park as many cars as possible in a minimum of space. To do this, it is planned to construct a building 85 ft. high with a 25-ft. basement. This is approximately the equivalent of an ordinary six-story building and it will measure 145 x 152 ft.

Within this building there will be a corkscrew-like continuous single floor extending from the basement to the roof in a rectangular spiral. This floor spirals upward on a 4 per cent grade around a central core, which contains a passenger elevator, a man lift and a stairway.

This continuous floor is 60 ft. wide, permitting a two-way traffic lane in the center and a depth of 20 ft. on each side of this lane for continuous rows of individual parking areas at right angles to the traffic lane.

In parking his car, the driver enters the up-traffic lane from the street en-

trance and continues up this rectangular spiral until he reaches a vacant or an especially assigned stall. Upon reaching the stall, he pulls in between the painted lines to park. Upon leaving, he simply backs out into the down-traffic lane and proceeds downward to the street entrance.

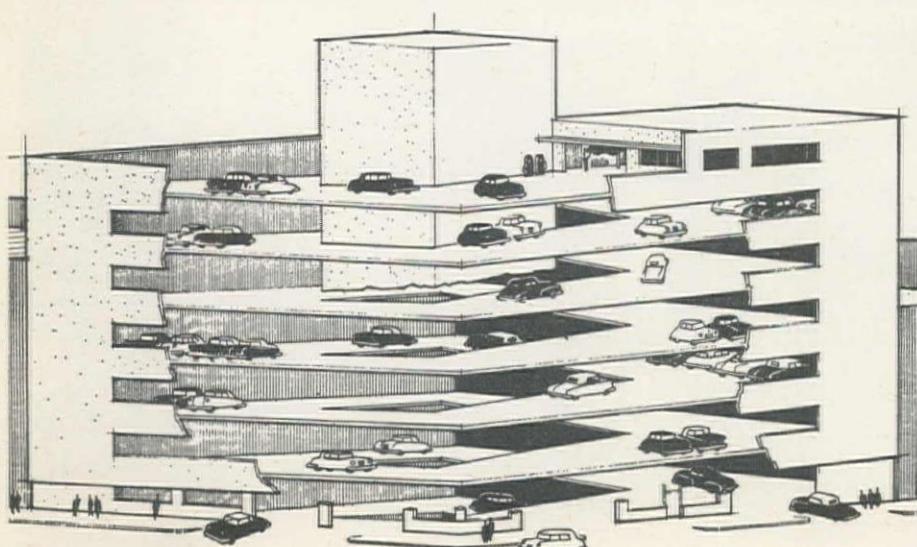
Parking stalls are in continuous rows along the traffic lanes as they proceed from the basement to the roof, therefore, the rectangularly spiraling ramp actually becomes one continuous floor, reaching upward from the basement to the roof.

Looking towards the future, space has been allotted to accommodate the trend towards wider automobiles. This requirement in addition to high construction costs which exist today might ordinarily result in a higher over-all cost. However, the unique design developed for this particular garage has actually resulted in a saving of 30 per cent in construction cost on a per car parking space basis as against the cost of ordinary, conventional, mid-city buildings.

Construction is scheduled to start March 1, 1948, and is to be completed November 1, 1948.

Murray Erick is structural engineer and Ralph Phillips is mechanical engineer. The P. J. Walker Co. are the contractors.

CUT-AWAY PLAN of the six-story, sloping ramp parking garage proposed for downtown Los Angeles by the General Petroleum Corporation. The grade of the ramp will be 4 per cent, and there will be ample room for two driveways and two rows of parking stalls all the way from the ground level to top. Center structure carries elevators and stairway.



Davis Dam to Get Concrete Spillway

PLANS TO PUT a permanent spillway in the Colorado River at Davis Dam near Boulder City, Nev., have been announced. The project calls for a concrete spillway structure and channel to cut around the Arizona side of the river, and gravity walls along this channel.

The spillway channel, 4,500 ft. in length, will serve first as a diversion bypass for the waters of the river, and later will become the permanent detour for the river around the dam and water entering the penstocks from it above the powerhouses.

At its upstream end, the channel has a bottom width of 200 ft. From about midpoint, it is excavated through abutment rock with a bottom width of 50 ft., widening near the downstream end to create the powerplant forebay. The maximum cut being made is 200 ft.

First, the water will be diverted through the spillway by a cofferdam above the main damsite. Later, the Davis Dam structure, 140 ft. above the river bed and 1,600 ft. in length, will form the barrier across the old channel and turn the waters through the new cut.

Also, a cofferdam 1,600 ft. in length below the dam site will form the barrier across the old channel and turn the waters through the new cut. Upon completion of the cofferdams, expected within the next two months, isolation of the damsite excavation work will commence.

The Utah Construction Co. began pouring concrete in the power plant intake area a month ago. A total of 770 workers are employed at the site, and work is proceeding on a three-shift, six-day working schedule.

B. C. Asks '48 Construction Fund Totaling \$8,000,000

EXPENDITURE of \$8,000,000 will be the intention of the Federal Department of Public Works in British Columbia in 1948, if estimates which are going forward to Ottawa by the officials of the Department at New Westminster, B. C., head office for the Department, are accepted.

Items cover construction and extension of wharves, new fishermen's floats and harbor improvements, extensive dredging, and permanent improvement work in tidal rivers and on the coast line.

Ken Morton, chief engineer for the department, states that plans for this work, an all-time record, include projects held over during the war years.

It is expected that bulk of the estimates will be approved. Some items, including the \$800,000 estimate for extension to the Steveston jetty, may be delayed for another year.

Estimates for which plans have been worked out include the \$1,500,000 extension and improvement to the south jetty at the mouth of the Fraser River.

WASHINGTON NEWS

... for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—Westerners, especially those from the areas on the Pacific side of the Rockies, are rather perturbed about the scant information which has leaked out about the plans former President Hoover has in mind for the reorganization of the Federal Government. As you may know, he is the head of a body appointed by the President which bears the impressive and rather overwhelming title of the Commission on Organization of the Executive Branch of the Government.

This Commission has been quietly getting ready to throw into full gear during the past three or four months. It has offices at various points around the Capital. The office which has most interest to most Westerners is the one located at 2500 Que Street, N.W., in the International Bank Building, Washington, D. C. Here is housed M. J. Madigan, who is in charge of all matters that have to do with reclamation, irrigation, hydro-electric power, and similar activities of the Federal Government.

Mr. Madigan, who comes from New York, is a lawyer with engineering intelligence. He is one of the proteges of Chairman Robert Moses of the Public Works Division of the Commission. Moses, you may recall, is the dynamic city planner, and parks, and public works champion, who performed unusually splendid services for the people of the City of New York. Mr. Madigan is an earnest and pleasing gentleman; but one strike against him, in the opinion of some Westerners, is that, by his own admission, he has made it clear he knows virtually nothing about reclamation, or irrigation, or any of the problems so vital to the West.

Few Westerners on Commission

Mr. Hoover hails politically from California, and has presumably the feel for Western needs. He headed the original Colorado River Commission. It would be reasonable to assume that he would function in relation to Western problems with sympathy and complete understanding. He heads a Commission, however, that is not overburdened with people who understand the West; and the appointments on the staff have been rather striking for the absence of Westerners.

The Commission, aside from Chairman Hoover, consists of Vice Chairman Dean C. Acheson, an internationalist in the professional State Department mold; Civil Service Commissioner Arthur S. Flemming, a New Yorker, and a professional Government official; George H. Mead, a Big Business corporation figure from Dayton, Ohio; Sen. George D. Aiken, more or less an independent liberal from Vermont; Sen. John L. McClellan, from Arkansas; Dr. James K. Pollock, a university profes-

sor and sociologist, with liberal tendencies, who also is a radio commentator; Joseph P. Kennedy, of Boston, the former Ambassador to Great Britain; Congressman Clarence J. Brown, of Ohio; Congressman Carter Mansaco of Alabama and James H. Rowe, a New Dealer, who hails from Butte, Mont., but who has been closely entwined in the Washington picture as White House assistant, and in similar roles, the past fifteen or sixteen years.

The Secretary of the Commission is Francis P. Brassor, a Washington political figure; and the special assistant to Chairman Hoover is Lawrence Richey, who has been Mr. Hoover's shadow for so long that scarcely anyone thinks of Hoover without thinking of Richey.

Wipe out Department of Interior?

The Western contingent is particularly disturbed because it is understood the Commission plans to champion a plan to wipe out the Department of the Interior, and to supplant it with a Department of Public Works which would embrace all construction activities and allied responsibilities now scattered among many Government agencies, and would give the head of the new agency the status of a Cabinet officer, with a seat at the White House table. In all likelihood the non-construction functions and powers of the Department of the Interior, in the event of such change, would be scattered among other agencies, probably among functionaries who have no genuine understanding of Western problems.

The people here in the East really do not appear to have any real conception of the vast changes that have occurred in the West with the progress of the last War, nor of the stupendous development that has actually unfolded since the close of the War. They only vaguely sense that the monumental shift in population from Eastern centers has mainly been to the other side of the Rockies. The very real and increased need of the existence of the Department of the Interior for the actual and potential business of the West is not understood, and any effort to sell the idea would probably arouse a protest against special agencies for the benefit of sections.

It is clear to some of us here in the Capital that an intelligent and cohesive and vigorous drive by all the economic and social as well as political forces of the Western area affected might bring home to the East a sharper comprehension of the right of the West to more specialized Government treatment of its needs.

Next election may be factor

There seems sound reason to believe that eventually the Hoover Commission

may bring out a report urging the creation of the Department of Public Works. The Commission is expected to do its job in three years. Should the next election put in the White House a Republican President as well as place in the Capitol another Republican majority, it is reasonable to assume that such recommendation would find favor with the legislative as well as with the Executive branches of the Government; on the other hand, if again we have a Democratic Executive, and a Republican Congress, it is just as certain that the Democratic Executive Branch would champion the establishment of the new Department.

On the other hand, it is not improbable that the pressure of Eastern sentiment might impel even a Republican Congress to go along, in essence, with the Democratic Executive in the substance of the plan. These are the considerations that make the whole subject serious to the Westerners in the Capital.

Tidelands claims controversy

This is written on the eve of the invasion of Governors and other high officials from many states to testify at the hearings in the Senate Committee concerning the tidelands controversy. The whole debate was recently well epitomized by Congressman Walt Horan of Washington. He introduced a bill to confirm and establish the titles of all States to lands and resources in and beneath the navigable waters within state boundaries. Discussing his bill, Congressman Horan said:

"This bill, one of more than two dozen identical measures proposed since the first of the year by Members of Congress from states having shorelines, is part of the organized campaign necessary to prevent the Federal Government from further invading the domain of the states.

"While the spotlight in the tidelands controversy has been aimed at the highly prized oil along the shores of California and Texas, our State of Washington has definite interest in the case. Along Puget Sound, much valuable property has been reclaimed by filling in with hauled earth. Title to this land automatically is placed in jeopardy by the Supreme Court ruling placing title to tidelands in the Federal Government. In addition, rich oyster beds and other important commercial features of the Washington coast come into dispute.

"Oddly, however, the Supreme Court ruling appears to be in contradiction to provisions of the State Constitution of Washington, which were accepted by the President and Congress when Washington entered the Union in 1889.

"Our State Constitution specifically claims title for the State to all the lands subject to interpretation in the tidelands case.

"The State of Washington, in which one-third of the land area now is controlled by the Federal Government, can hardly afford to lose still more land from its tax rolls. Most of the present holdings are in National Forests and Parks, Indian Reservations and the Atomic Energy Project. In the Fifth District,

Ferry County is 83% Federally owned, leaving owners of only 17% of the area to support county government and school system.

"The trend toward even more Federal ownership of land must be halted or the tax base for local government will be destroyed."

Bevy of California adherents

There is some fear here before the fight on the Hill begins next week (the last week of February), that the claims of California and Texas, based wholly upon the oil lands, may work to the disadvantage of the rest of the states. It is assumed there is some basis for the claim of the Federal Government to the oil lands for the national defense. The Governors have arranged a big powwow before the formal presentation is launched on the Hill.

Gov. Earl Warren has brought with him experts, as well as Attorney General Howser, and several Assistant Attorney Generals of the State of California. There are also a half dozen or more Senators of the State Legislature of California, as well as officials of San Francisco, of Los Angeles, and San Diego.

We have seldom had such a rally of ultimate State Brass in such numbers in recent gatherings in the Capital. It so happens that the California State Society, which is headed by Director George F. Meredith of the Senate Small Business Committee, is having a reception the day before the fireworks begin. Literally every section of the state is heavily represented in the receiving line by conspicuous visiting figures from every important area.

It will interest you to learn that the function takes place in the oldest dwelling existing in the Capital. The structure is known as the Belmont House. It was built before the District of Columbia was established on the banks of the Potomac. Washington himself often was a visitor in the home. It is almost a museum of priceless things which have survived colonial times. It is located just across the street from the Supreme Court, and around the corner from the Capitol.

U.S.B.R. official—False testimony?

Hearings on the Interior Department Appropriations bill are under way. Sen. Knowland, California, has roundly charged R. S. Calland, assistant director of the Bureau of Reclamation's Sacramento office with deliberate misrepresentation. The Senator accuses Calland of giving false testimony before the Senate Appropriations Committee.

He says Calland testified under oath he had no authority for sending out a letter last June directing Reclamation offices to spend 1948 funds as quickly as possible at the wish of the Secretary of Interior and the Reclamation Commissioner. If he can find legal basis for the action, Knowland intends to cite Calland before the Congress for contempt.

In the light of all this it seems likely the hearings before the House Committee on March 9 to 14, when Mike Straus must appear, are apt to be full of explo-

sive elements. Mike is never very tender about anyone else's susceptibilities, and it is entirely unlikely the Members of Congress will be gentle with Mike.

There are intimations the big show, however, will occur when Secretary Krug makes his appearance on or about March 15. It is understood the consensus is that Straus will never let go of his job until Krug leaves the Department of Interior.

The pachydermous Mike also is a tough fighter. He can take it as well as give it. The word is that Krug is fed up with his rather impossible position. He is not very well, according to Interior reports; and he has sustained material losses by reason of his devotion to the job, if the same sources know what they are talking about.

Politics are ruthless in their practice on the banks of the Potomac; for which reason it would not be surprising if those in opposition to Straus and Krug would focus their fight on Krug as the most vulnerable object.

Rockwell bill battle promised

The Rockwell bill, H. R. 2873, passed the House, placing all Reclamation projects more closely under Congressional control, and ending the use of Federal funds by the Bureau of Reclamation when derived from interest paid on Federal loans. But the bill has been buried in the Senate Committee, and is not expected to get out of the Senate Committee during this session. We hear the Northwest is opposed to the bill.

The word comes informally from the Bureau of Reclamation that the enactment of the Rockwell bill would raise Federal power rates on 16 projects from 25% to 49%. But those who are determined the restrictions of the Rockwell bill shall be forced upon Straus and his people have served notice through Congressman Jensen of Iowa, Chairman of the Interior Appropriations Committee, that unless "the Rockwell bill becomes law as amended and passed by the House, there will be a battle royal on every Reclamation project in the West."

The attitude of the Jensen group means that there will be a showdown fight in the House. And this battle, as well as the fight in the Senate, spells a prospect of an indefinite delay in reporting the Interior appropriations bill during this year.

Watch for the particular fireworks on the wrong estimate by Straus on the carry-over on Central Valley funds. He told Congress last May the unobligated balance was \$10,722,162. Just previously the Sacramento office had estimated the carry-over at \$25,000,000. It actually turned out to be \$21,104,000. Straus and Krug airily dismissed the erroneous estimates as "a bad guess." Sen. Downey said he regarded the "guess" as "the most extreme gross desire and attempt to mislead" Congress.

Appropriations will be cut

Another \$14,000,000 appropriations for reclamation in the West was recommended by the President late in January in his supplemental budget for the

fiscal year 1948. The items are: for construction, \$700,000, Anderson Ranch Dam; \$800,000, Payette Division; \$109,000, Rathdrum Prairie Project, Idaho; \$55,000, Colorado River Dam fund, Boulder Canyon Project. For operation and maintenance, Parker Dam project, \$726,000; North Platte project, \$56,800. The U. S. Geological Survey will get \$635,500 additionally to match state and municipal funds for water investigation, including stream gaging, ground water, and water-quality studies, providing Congress supplies the supplemental funds.

There is much question, under the circumstances of the unfortunate conflict between the administrative officials of the Department of Interior and the Members of Congress, just how much legitimate money will be provided for Western projects. There is no remote doubt administrative appropriations, especially for Reclamation, will be deeply cut. Every administration item will be savagely pruned. But there is every reason to feel that legitimate appropriations for construction will be accepted more or less at face value. Not more than 10% construction cuts, at the worst, are expected.

The word already has come from the House Appropriations subcommittee that Army Engineers funds for flood control, power, rivers and harbors, and other civil functions, estimated in the budget at \$395,940,000 will be cut 15%. Apparently the Engineers agreed that this cut would not embarrass the continuation of work under way, but will defer commencement of entirely new projects. From Interior comes the informal word that generating capacity on Western hydro-electric projects may be boosted to a total of 9,600,000 kilowatts by 1957, an addition of 2,948,100 kilowatts, by June, 1953. There are included 120,000 kilowatts of steam-generating capacity for the Central Valley.

Miscellaneous

The U. S. Geological Water Resources Review reports drought in central and southern California and the southern intermountain region continues unalleviated. Snow packs in the Sierra are disappointing. Floods of moderate intensity are reported in Western Oregon, with peak discharges in the Willamette River Basin generally about two-thirds as great as during the December, 1945, flood.

In a special message the President asked Congress to supply \$500,000,000 for Federal aid to highway building during the fiscal years 1950-51. The American Roadbuilders Association at its 45th annual meeting in Washington, D. C., formally resolved for an annual expenditure of \$800,000,000 of Federal funds for road building. T. E. Stanton, California Department of Public Works, Sacramento, was elected vice-president of the ARBA for the Western District. Leo C. Hammett, county supervisor, Modesto, Calif., was chosen vice-president of the American Institute of Local Highway Administration. J. T. Callaway, Goodyear Tire and Rubber Co., was re-elected president of ARBA.

Gas Pipe Line Planned From Canada to N'West

DEFINITE PLANS for construction of a \$78,000,000 pipe line to supply Portland, Seattle, and a score of other cities in the Pacific Northwest with natural gas from Canadian oil fields were revealed recently as the Northwest Natural Gas Co. in New York filed an application with the Federal Power Commission at Washington, D. C., for the required certificate of public convenience and necessity.

The 606 mi. of 24-in. pipe would start at Kingsgate, British Columbia, where it would tap rich reservoirs of natural gas. Then it would cross the Rockies to Spokane, roughly follow the Columbia River to Walla Walla, The Dalles and Portland before turning north to Seattle. Another 150-mi. extension of 18-in. pipe would go to Vancouver, B. C.

A number of lateral lines are projected along the route. An alternate route is proposed from Spokane direct to Seattle, thence south to Portland.

The company, organized in 1946, has already started negotiations with the Canadian government for purchase of the gas, which is in surplus supply. Preliminary surveys have been completed and tentative financial arrangements made. Construction will begin late in 1949 or 1950, if pipe is then available, with completion planned in one year.

To keep the gas moving through the 756 mi. of main line, the plans call for four pumping stations, 170 mi. apart, designed to maintain a pressure of 750 p.s.i. in the pipe. Maximum daily delivery capacity of the pipe line would be 290,000,000 cu. ft.

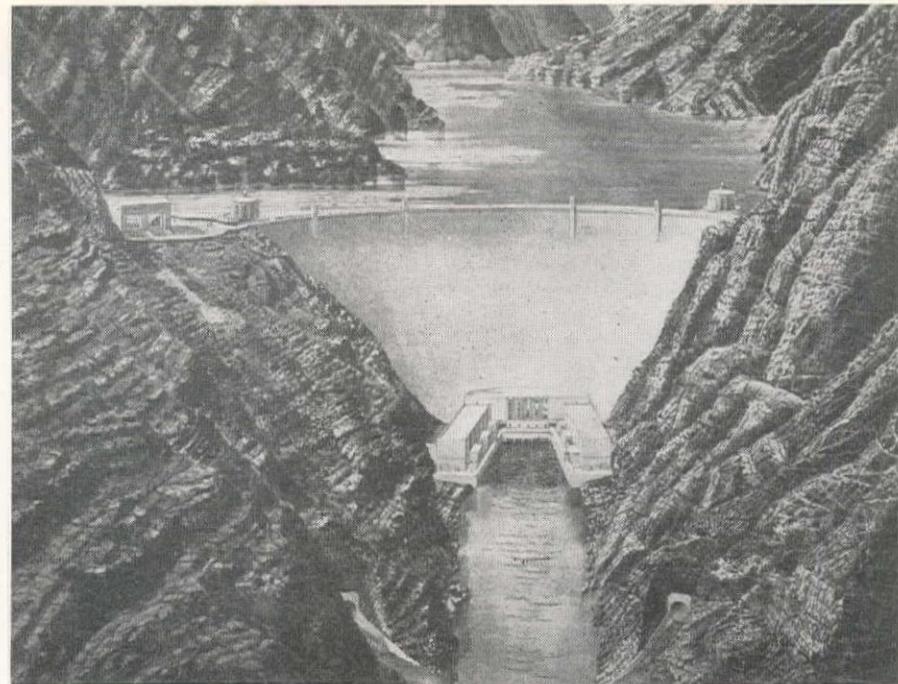
Water Conservation Measures Asked for Oxnard Plain Area

A WATER SAVING PLAN has been recommended in California's Oxnard Plain area by Vern M. Freeman, resident engineer of the Santa Clara Water Conservation District. He outlined a four-point plan of practical water conservation measures to meet the seriousness of drought conditions.

First, he recommended that Oxnard city water be metered, since the flat rates in effect now are conducive to a waste of water. Then, he proposed the establishment of a soils laboratory to determine when and how much water should be applied for orchard irrigation, since laboratory control of orchard irrigation usually results in less water being applied.

He also suggested that ranches on the Oxnard Plain substitute a system to transport irrigation water from wells to fields by use of concrete pipe distribution systems in place of the open ditches now used. Freeman also asked that the duck clubs in the area be denied use of the valuable commodity.

A summary of the water needs of the Oxnard Plain and adjacent areas appeared in *Western Construction News* for December, 1947.



ARTIST'S CONCEPTION OF U.S.B.R. CONCEPTION OF SNAKE RIVER DAM

A POTENTIAL multiple-purpose project at the famous Hell's Canyon of the Snake River on the boundary between Oregon and Idaho would include the highest dam in the world, 742 ft. above bedrock, on the basis of preliminary studies by the Bureau of Reclamation. The dam would create a reservoir to impound 4½ million ac. ft. of water.

U.S.B.R. Approves Vast Central Arizona Project Plan for Action by Congress

APPROVAL OF THE vast Central Arizona Project which would provide urgently needed power at Bridge Canyon above Hoover Dam for California and Arizona, and which would supply irrigation water needed to alleviate drought conditions in Central Arizona, has been approved by the Bureau of Reclamation. The proposed project will be transmitted to Congress for legislation accompanied with attached comment from the seven Colorado River Basin States and other involved agencies.

The plan for the project is based on the assumption that claims of the State of Arizona to Colorado River water required for the project's full development are valid. In his report, Commissioner of Reclamation Michael Straus stated, "It is assumed that the Congress in considering this proposed project will do so with full recognition of the controversy involved."

The project, as outlined in the report, would divert water from the Colorado River at Lake Havasu, back of Parker Dam, through the 241-mi. Granite Reef Aqueduct to the Phoenix area. The additional water would furnish enough supplemental water to permit irrigation of 640,000 ac., but would not permit development of new irrigated lands.

The project also involves measures to arrest the depletion of ground-water resources in the basin, and an exchange of waters between the Salt River and the Colorado River to permit additional

diversions in the Gila River Basin above Granite Reef. Municipal water supplies for the City of Tucson also would be assured.

Estimated cost of the project is \$738,408,000. Feature of the program would be construction of the Bridge Canyon Dam, 637 ft. high above streambed, on the Colorado River at the head of Lake Mead. It would create a reservoir of 3,720,000 ac. ft. capacity for silt retention, flood control, and generation of power by a 750,000-kw. capacity plant.

The plan also calls for Bluff Dam on the San Juan River, and Coconino Dam on the Little Colorado River for silt retention, river regulation, and flood control. The combination of these three reservoirs would permit reduction of the flood reserve required at Lake Mead and allow a higher power head at the Hoover power plant.

Other construction features would be: Four Havasu pumping plants along the first twenty miles of the Granite Reef Aqueduct to raise the water from Lake Havasu a total of 985 ft. to a saddle in the mountains from which the water would flow by gravity; Granite Reef Aqueduct, from Lake Havasu to the Granite Reef Diversion Dam on the Salt River, east of Phoenix, with capacity of 1,800 cu. ft. per sec.; enlargement of Horseshoe Dam on the Verde River to increase the present 68,000-ac.-ft. reservoir to 298,000 ac. ft.; a 74-mi. Salt-Gila Aqueduct to convey water stored back of Stewart Mountain Dam on the Salt

River to Picacho Reservoir for irrigation use along the Gila River; Tucson Aqueduct, 70 mi. long and with 18 cu. ft. per sec. capacity, to carry water to the Tucson distribution system, and other facilities.

The investigations underlying the report were conducted by the Bureau of Reclamation under Regional Director E. A. Moritz of Boulder City, Nev., and the State of Arizona, with cooperation of other Interior agencies and Federal departments.

New Repayment Plan For Salt Lake Project

LEGISLATION extending the repayment period for the Provo River Project in Utah, necessary to permit construction of the Salt Lake Aqueduct to move ahead, has been approved by the United States Senate. The measure was sponsored by Senator Arthur Watkins of Utah.

Watkins explained that the legislation is necessary since rising construction costs have boosted the cost of the Deer Creek and aqueduct provisions of the project an estimated \$3,400,000 above the amount the Provo River Water Users' Association and the Metropolitan Water District of Salt Lake City have contracted with the Department of Interior to pay.

Under the Watkins bill, the Department of Interior would be authorized to negotiate an "interim cost repayment plan" under which the excess cost of the project would be repaid by the Association and the District during the next few years. After the excess cost had been repaid, the Department could then put

the general repayment plan back into effect.

The project is designed for irrigation and to increase the domestic water supply for the Salt Lake area. In 1936, the Water Users' Association contracted to repay its share of the then estimated cost, \$7,600,000, in 40 years. In 1938, the Metropolitan Water District undertook to repay its share, \$5,500,000, in the same period.

OBITUARIES...

George B. McFadden, 92, Colorado pioneer and civil engineer, died Feb. 12 in Denver. He was responsible for the construction of much of the Denver Tramway Corporation's system, and was a construction engineer in the building of part of the lines of the Colorado & Southern Railroad. He came to Colorado from Iowa in 1878.

Fred W. Kelly, 67, long time land surveyor in the Puget Sound area, died in Seattle on Jan. 25. During the earlier part of his career he was engaged on the construction of the Oregon Railroad & Navigation Co. line along the Columbia River. He had been an employee in the Seattle city engineer's office early in the century.

Collins B. "Charlie" Arnold, 74, chief engineer for the Boettcher Investment Co. in Denver since 1920, died recently. Prior to 1920, he was for eight years traveling construction engineer for the Intermountain Railroad Light & Power Co. with headquarters at Denver and Laramie, Wyo.

Joseph C. Boyd, 83, civil engineer at Sacramento, Calif., died recently. He became city engineer of Sacramento at the age of 21, and later held a number of city and county positions including County Surveyor and city engineer. He finally entered private practice after 1907. He was president of the Sacramento Section of the American Society of Civil Engineers in 1925.

Eric Gram, 63, assistant bridge and building supervisor with the Southern Pacific Railroad, died Feb. 7. He had direct charge of tunnel, bridge and snowshed crews in the Donner summit section with headquarters at Norden, Calif.

Leonard H. Booth, 75, superintendent of the Burlington, Wash., water system for nearly thirty years, died in Seattle on Jan. 6. He had been water system superintendent in Burlington from 1918 until 1944.

Everett B. Thompson, 50, associate engineer in the Washington state land office, died in Olympia on Jan. 29. He was a veteran of both world wars, having served with the Army Chemical Warfare Service in the first, and the Navy in the second.

Hjalmer Beckman, 58, first superintendent of the Billings, Mont., municipal sanitation department, died on Feb. 3. Prior to taking charge of the Billings sanitation department, Mr. Beckman had for many years been associated with various construction firms in the area.

J. Burdette Brown, 60, member of the teaching staff of the College of Agriculture at Davis, Calif., died January 7. He was an expert on water resource problems. He was president of the Sacramento Section of the American Society of Civil Engineers in 1928.

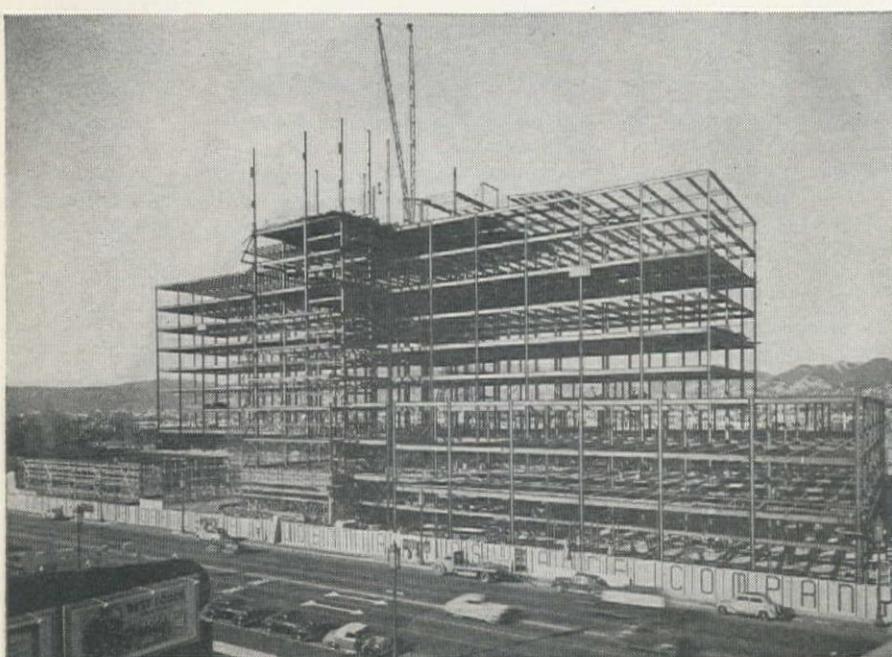
Felix Robinson, 66, retired Civil Engineer, died at Steilacoom, Wash., on Jan. 17. Until his retirement three years ago he had been employed as a civilian member of the post engineer's staff at Fort Lewis.

Charles P. Goulette, 66, retired civil engineer died Jan. 5, in Seattle. A native of Seattle, Mr. Goulette was employed in the Seattle city engineer's and the King County engineer's offices from 1902 until 1932 when he retired.

Charles A. Knock, 63, former construction engineer for Otis Elevator Co. in San Francisco, was found dead in his car near Hanford, Calif., on Jan. 6.

Warren G. Tilton, forest engineer for the West Coast Lumbermen's Association at Portland, Ore., died suddenly at his home Dec. 23, 1947.

3,600-TON STEEL SKELETON FOR NEW LOS ANGELES OFFICE BUILDING
STEELWORK is virtually complete for Prudential Insurance Company's new office building on Wilshire Blvd. in Los Angeles; 3,600 tons of structural steel, fabricated and erected by Bethlehem Pacific Coast Steel Corp., was used in the structure, which will be earthquake-proof. William Simpson Co., Los Angeles, are the contractors.



R. F. C. Asked to Finance Full Cost of Tacoma Narrows Span

THE WASHINGTON STATE Toll Bridge Authority has stated that it will ask the Reconstruction Finance Corporation to finance the full cost of the \$14,000,000 Tacoma Narrows Bridge. Recent bid calls brought in a low bid of \$11,196,584 for construction of the span. Investment houses refused to buy the bonds. The state had recommended a \$10,000,000 bond issue, which was estimated as adequate to cover construction costs.

The Authority is also proceeding with an alternate plan of financing that envisages a new call for bond bids to be opened in March. It is expected that a new survey will show that \$14,000,000 can be amortized from tolls and revenues.

Call for Bids on Hungry Horse Dam

A CALL FOR BIDS for the construction of Hungry Horse Dam, fourth largest concrete dam in the world, on the South Fork of the Flathead River 9 mi. southeast of Columbia Falls, Mont., has been issued by the Bureau of Reclamation.

Bids for the construction of the dam are to be opened April 1 at the Hungry Horse Government Camp in Montana. The contractor will be allowed 2,000 days to complete the job.

When completed, Hungry Horse Dam will provide much-needed power production for the Pacific Northwest, flood control, irrigation water for Western Montana lands, and stream regulation for the Columbia River which will increase firm power capacities of existing Columbia River plants. Construction of the dam will create a reservoir with a capacity of 3.5 million ac. ft. of water. Partial storage is planned in the reservoir by 1952.

Specifications, issued by the Chief Engineer in Denver on February 25, will provide for the construction of a concrete arch dam 520 ft. above foundation, 2,115 ft. long, with an arch radius of 1,200 ft. Approximately 3 million cu. yd. of concrete will be required for the dam and appurtenant structures. A feature of the project will be a glory-hole spillway with a tunnel 24.5 ft. in diameter which will pass a flow of 53,000 cu. ft. per sec. A 30-ft.-wide roadway is to be constructed across the crest of the dam.

The only concrete dams which exceed Hungry Horse Dam in size are Grand Coulee, Shasta, and Hoover Dams.

Included in the bid call is construction of a reinforced concrete power plant at the downstream toe of the dam in the river channel. The plant will house four 75,000-kva generators. Power produced at Hungry Horse Dam will be integrated with the Bonneville and Grand Coulee systems and other plants of the Northwest power pool.

A 36-ft. diameter tunnel, 1,100 ft. long, to divert the waters of the Flathead

River during construction of the dam next summer is now being excavated under a \$643,000 contract with the Guy F. Atkinson Co. of San Francisco. A camp to house Government workers and an eight-mile access road to the dam have already been constructed.

It is estimated that peak employment will be between 3,000 and 4,000 workmen with an average monthly payroll of \$600,000. Winters in the area are often severe and may possibly restrict construction activities to a seasonal basis. The dam is to be located about eight miles south of Glacier International Park, a summer mecca for approximately 350,000 tourists annually.

NEW BOOKS...

WATER WELL HANDBOOK—by Keith E. Anderson, Geologist and Engineer, State of Missouri Division of Geological Survey and Water Resources. Published by the Missouri Water Well Drillers Association, Box 250, Rolla, Missouri. Stiff paper cover, 200 pp., 5½ x 8½.

The handbook has been prepared for drillers, engineers, and geologists working with water wells who have occasion to refer frequently to charts, tables and other data scattered throughout many books and catalogs. In compiling the handbook, an attempt was made to gather together only the information most frequently referred to by persons working with ground water supplies.

HIGHWAY STATISTICS, 1946—prepared by the Public Roads Administration, Federal Works Agency. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price, 50 cents. Size 8½ x 11.

The pamphlet, second in an annual series, presents the 1946 statistics and analytical tables of general interest on the subjects of motor fuel consumption, motor vehicle registration, State highway-user taxes, financing of State highways, and highway mileage. The brief text is not intended to provide a full explanation of all of the data, since in most cases they are self-explanatory. It is intended only to call attention to information of particular interest or significance and to supply definitions of the terms used in the tables.

STRESS ANALYSIS AND DESIGN OF ELEMENTARY STRUCTURES—Second Edition, by James H. Cissel, Professor of Structural Engineering, University of Michigan. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York City 16. Price \$5.00.

The book covers the principles of structural analysis and design of timber, steel and concrete structures. In this second edition, Dr. Cissel has brought the specification data up to date. The material has been rearranged to give current code requirements for floor

loads in buildings, a more complete discussion of roof loads and current live-load requirements for highway bridges and railroad bridges. The material on reinforced concrete has been reworked to bring it into line with present-day recommendations of the American Concrete Institute. A new highly significant chapter has been included dealing with the design of Light Gage Steel Members. Illustrative examples are given on typical solutions of basic problems. The new edition is an important contribution to the modern literature of structures.

The Editor's Mail...

Feb. 23, 1948

Dear Sir:

Being a regular reader of your fine magazine *Western Construction News*, I must comment on your editorial entitled "Airports" which appeared in the January issue. You stated that the Oakland Airport and Mills Field were 14 miles from the heart of each business district. I disagree with you, as Oakland Airport is but 7 miles from Oakland's business district, though Mills Field is better than 14 miles from San Francisco. Why discriminate against Oakland Municipal Airport when it is better located and more convenient than Mills Field in South San Francisco?

I highly agree with you that the two cities used poor judgment in planning their airports. I've traveled through most of the nation's first class airports and find that where two cities are closely tied together they plan one airport to serve both communities, as in the case of Los Angeles. But no, San Francisco's supervisors are so afraid that Oakland will surpass them in something, as I've noticed many times. Los Angeles advertises the whole area without discrimination against any town, but here in the Bay area one hears only "San Francisco" this and that."

I'm of the belief that cooperation among groups and cities is the best for everyone conceived. If these two cities had gotten together on the airport issue years ago and planned a huge airport out in the Bay on filled land, we would now have in the Bay area the finest and biggest airport in the world, which would serve as a link between the two cities. Then there wouldn't be this childish squabbling as exists today, with each trying to outdo the other. A little common horse sense and cooperation between the two cities would greatly help in building up the Bay area.

Sincerely yours,

Joseph G. Lenart.

* * *

Editor's Note: We appreciate Mr. Lenart's comments on our editorial, and apologize to him and Oakland if our mileage was wrong. But it doesn't really matter; both of the municipal airports in the San Francisco Bay region are much too far away from the centers of population.

Mr. Lenart's comments about a fill are interesting in view of the following

letter from the Civil Aeronautics Administration to the San Francisco Bay Crossing group, supporting the Reber Plan for development of the bay, including a centrally-located metropolitan airport which would be within five minutes drive of either municipal center.

* * *

Santa Monica, Calif.,
February 6, 1948

Mr. Walter J. Walsh

Dear Sir:

With respect to your suggestion of January 28, 1948, that this Administration study the Reber Plan for the development of the San Francisco Bay Area, please be advised that we have considered the merits of this proposal for some time. In fact, Mr. Reber, himself, addressed us on October 15, 1946 at which time we stated "This proposal is, of course, too comprehensive to pass judgment upon with only a cursory examination. It is being circulated here in the Regional Office with a view toward giving it thorough consideration and eventually passing on to you the benefit of whatever comment arises from a detailed examination."

While some features of the Reber Plan are definitely beyond the scope of our interests and we are obviously not qualified to comment on them, several

of the problems it attacks are definitely within the realm of factors we must consider in evolving an airport plan. For example, we must study industrial and residential expansion, population growth and employment, surface transportation of all kinds, aeronautical acceptability, and cost. In the case at hand, we became indirectly concerned with water conservation (for without it we shall not have the otherwise logical increases in industrial and residential expansion and population), facilities for recreation, and beautification. The latter two are always items which go hand in hand with increases in population and changes in land use, and the impact of any public improvement on them may not be overlooked by the intelligent planner.

To us, the Reber Plan seems entirely practicable. It not only provides the additional area for expansion which in our estimation has to be provided one way or another if the Bay Area is to develop to its proper optimum, but it provides an excellent opportunity for the construction of several airports of varying classifications to handle a multiplicity of purposes. That opportunity does not exist as the situation presently stands for probable development is extremely limited for geographic and financial reasons. From now on out, it appears

that no new airport may be developed in that portion of the San Francisco Bay Area as encompassed by the Reber Plan unless it is a part of an integrated plan. Economic factors such as high land and engineering costs would seem to preclude their construction unless they are allied with other projects.

Conversely, any plan which purports to solve, among other things the transportation problems of a metropolitan area and which ignores the staggering potential of not only scheduled and non-scheduled commercial air carrier activity, but private ownership uses as well, is, in our opinion, not a plan at all, but a blunder.

While the preparation of metropolitan area plans is not our normal function, the absence of an integrated San Francisco Bay Area plan for airports forces us to inject ourselves into these proposals so that we may do the best we can with the tools at hand. Although there are a myriad of details to be discussed, many of which cannot be waved aside when the time comes, it may be stated that we believe the Reber Plan comes closer to offering solutions to the upper bay airport problems than any proposal thus far presented to the public.

R. W. F. Schmidt,
Superintendent of Airports,
Civil Aeronautics Administration.

PERSONALLY SPEAKING

The election of Robert F. Blanks of Denver, Colo., Chief of Research and Geology for the Bureau of Reclamation, as president of the American Concrete Institute, was announced recently to the 500 delegates attending the annual convention of the Institute in Denver. Blanks succeeds Stanton Walker of Washington, D. C. The new president of the Institute has been the recipient of many honors and awards from technical and professional societies, the latest being the award of the Thomas Fitch Rowland prize from the American Society of Civil Engineers at their winter meeting. Blanks first came into prominence in the professional field in the cement and concrete investigations for Hoover Dam, and later, all engineering research laboratories of the Bureau of Reclamation were consolidated under his direction.

health, will return to his former position of bridge engineer. He had served as state highway engineer since 1941.

Gail Hathaway, Special Representative to the Chief of Engineers, Department of the Army, and vice-president, Zone II, American Society of Civil Engineers, was

ROBERT W. JENNINGS was named Bureau of Reclamation construction engineer on the Paonia Project, Colo. He comes from the Provo Project in Utah to supervise directly construction of the earthfill dam and canal works which will provide irrigation water for 15,000 ac.



Denton H. Hayes, assistant division engineer for the Nevada State Highway Department at Ely, has been named division engineer at Tonopah. He will succeed J. D. Meacham, who has been division engineer at Tonopah for many years. Meacham will take the position of construction engineer left vacant for some time by the death of Arthur Soforth.

Scott P. Hart, materials engineer for the Montana state highway commission, has been appointed state highway engineer, succeeding Howard W. Holmes. Hart has been in the state highway department since 1923, except for a period of military service, and has been successively resident engineer, district engineer, maintenance engineer, and materials engineer. Holmes, who requested relief from his position because of

elected chairman of the United States National Committee of the International Commission on Large Dams at the organization's recent meeting in Washington, D. C. He succeeds Commissioner of the U.S.B.R., Michael W. Straus, who will continue to serve as chairman until July 1.

George Gibson, former Director of Construction of Petroleum Administration for War and well known as a consultant on refinery construction, has been appointed New York representative of Bechtel Corporation. Gibson is a member of the American Petroleum Institute, American Chemical Society and American Society of Mechanical Engineers. In recent years, he has been identified with Hoover, Curtis & Ruby, and with other organizations in a consultative capacity.

H. J. Dickinson, until recently resident engineer on construction of the San Diego Aqueduct, has transferred to the Army Corps of Engineers, Sacramento District and has been assigned as resident engineer on the Isabella Dam Project, located approx. 55 mi. northeast of Bakersfield, Calif.

Ralph L. Parshall, Senior Irrigation Engineer of the Division of Irrigation, Soil Conservation Service, retired Feb. 1 after 35 years of service. He is the perfector of the Parshall measuring flume, which is now used extensively in the irrigated areas of the United States and foreign countries. Other problems in the field of irrigation on which he has done outstanding work are removal of silt from canals, return flow to

streams, consumptive use of water and water stage recording instruments. He started the snow survey and irrigation water supply forecasting in the Rocky Mountain area and supervised the program until his retirement. He also made the economic study for determining the feasibility of the Colorado-Big Thompson project. The results of his investigations have been published in numerous bulletins and technical papers.

Dr. G. D. Louderback, geologist of San Francisco, **Harold Conkling**, hydrologist, and **Ralph Proctor**, compaction dam expert of Los Angeles have accepted appointments to serve on the consulting board for reviewing plans and specifications for the Casitas Dam, to be constructed on Coyote Creek in Ventura County, Calif.

E. F. Emmick, resident engineer for the Washington State Highway Department for the past 23 yr. with offices at Hoquiam, has been appointed consulting engineer in the plans and survey division with headquarters at Olympia. Emmick will be succeeded at Hoquiam by **Vern Dorsey**, who has been transferred from Olympia.

The appointment of **William F. Saunders** as Pacific Coast representative for the Metal Lath Manufacturers' Association has been announced from the Association's headquarters in Cleveland, Ohio. Saunders will offer technical assistance to the construction industry in matters concerning metal lath and its application. He is a graduate of Stanford, and most recently served in the structural engineering section of the Los Angeles Building and Safety Department.

Gaeten M. Zucco, structural engineer for the Bethlehem Pacific Coast Steel Co., Seattle, has been recommended by the military committee of the Mountain Pacific Chapter, Associated General Contractors, to be commanding officer of the engineer port construction and repair group sponsored by the chapter under the Army's affiliation program. Zucco holds the rank of colonel in the Corps of Engineers Reserve and is a veteran of World War II during which he served with various engineer units in the Pacific.

S. B. Sanders, district engineer for the Montana state highway department at Miles City, resigned on March 1, and will retire from the engineering field. Sanders has been with the highway department for the past 17 yr. and has been district engineer at Miles City for 11 yr.

Joseph P. Adams, director of the Washington state aeronautical commission, and **Jess E. Buchanan**, president of the University of Idaho, were elected to offices of the American Road Builders' Association. Buchanan was elected a vice-president and Adams a director of the airport division of the association.

Lloyd C. Regnell is now Highway Engineer for the Public Roads Administration in Manila, the Philippines. He formerly spent six years in the Canal Zone and Panama with the PRA, and his work now is part of the rehabilitation program of the U. S. Government on roads and bridges in Panama.



CHARLES C. PARSONS

Charles C. Parsons, an employee of the Bureau of Reclamation for the last 11 years, has been designated safety engineer for Region 6. In the new position, Parsons, formerly district safety engineer for the Bureau's Columbia Basin Project, will direct the regional safety program in that part of Montana east of the Continental Divide, Wyoming east of the divide, and parts of North and South Dakota. As safety engineer, he will inspect all activities of the Bureau and contractors working on Bureau projects.

Robert A. Allen, for many years highway engineer of the state of Nevada, has been retained as consultant on highway engineering matters by the Western Highway Institute, research organization for the Western for-hire motor carrier industry with offices in San Francisco. Among the problems which Allen will analyze for the Western Institute is the restriction of truck axle loadings in the so-called bridge formula. He will also work with the Institute on highway planning matters.

Guido Ferini has been named city engineer of San Luis Obispo, Calif., to succeed **Kenneth Beck**, who has been employed on a part time basis for the past 12 years. Ferini has been named assistant engineer of the City of Santa Maria. Beck has been appointed as the county's first road commissioner under the new state-county road program set up by the Collier Burns Act.

Arthur L. Aarhaus, civil engineer of Hoquiam, Wash., has been appointed county commissioner for the third district of Grays Harbor County to fill out the unexpired term of **Glenn D. Sheeley**. Aarhaus previously served a term as county commissioner from 1938 to 1942. Sheeley resigned his post to accept the position of manager of the Moon Island airport, a county operated facility.

Dan J. Malarkey, general contractor in Portland for the past 21 yr., has taken into partnership **George A. Moore**, who has been associated with Malarkey since 1946. Moore had previously been associated with construction firms in San Francisco and Los Angeles, and from 1942 to 1946 was with United Engineering Co., Alameda,

Calif. The new partnership will be known as Malarkey and Moore, and will maintain headquarters at Malarkey's former location.

John Kukar has been named superintendent of construction and maintenance of the design, building, and airports department of United Air Lines. His headquarters will be located in Denver. Three regional maintenance engineers also have been appointed. They are **George Marshino**, for western region, with offices in San Francisco; **W. F. Ottenstein**, central region, Denver; and **Ben Seggerman**, eastern region, Chicago.

J. A. Cole, Wheatland, is president of the Wyoming Engineering Society, succeeding **J. G. Smith**, Cheyenne. Cole was raised from the vice-presidency at the recent convention of the Society in Casper, which was attended by more than 260 persons, largest attendance in the society's history. **J. E. Wiley**, Cheyenne, was named vice-president, and **Kirby H. Olds**, Cheyenne, was re-elected secretary-treasurer.

William J. Wenzel, director of public works, is acting city engineer of Great Falls, Mont., following the resignation of **Ed Henen** who had served as city engineer since 1937. **R. E. McCormick** has been appointed acting assistant city engineer, and **George W. Yeager** has been appointed assistant building inspector, succeeding **Morris Anderson**.

George Roland, highway maintenance foreman at Fossil, Ore., has been transferred to a similar position at Arlington. He has been succeeded at Fossil by **Herman Munjar**.

E. R. Bates has joined the Bureau of Reclamation staff on the Canyon Ferry project at Great Falls, Mont. He had been in charge of the Conrad, Mont., soil conservation office until his resignation in January.

Lt. Col. Donald A. Elliget has been appointed executive officer for the Portland district, Corps of Engineers. He succeeds **Lt. Col. John W. Miles** who has been placed in charge of all Portland district flood control work with the exception of the Willamette and Columbia River basins.

R. A. Work, senior engineer in charge of snow surveys in the Western states for the Soil Conservation Service, with headquarters at Medford, Ore., has been engaged in establishing a new mechanized network of 26 snow survey courses in Montana.

George McLean, formerly resident engineer for the Washington State Highway Department at Aberdeen, is now district maintenance engineer at Olympia. **Kenneth C. Williams** has been transferred from Tacoma to Aberdeen where he has succeeded McLean as resident engineer.

W. A. Bugge, formerly district engineer in the Pacific Northwest for the Asphalt Institute, has been appointed managing engineer for the Institute with headquarters in San Francisco. Bugge succeeds **Dan B. Miller**, who retired last month. Bugge is a civil engineering graduate of Washington State College and has served with the

Washington State Highway Department. Prior to joining the Institute staff, he was county engineer of Jefferson County, Washington.

N. W. MacPherson, former commissioner of highways for Alberta, has been appointed assistant deputy public works minister for British Columbia, according to announcement by the Hon. E. C. Carson, minister of public works. In 1914, MacPherson was appointed Alberta bridge engineer, and held that position until 1934. While he was Alberta commissioner of highways he also served as a member of the highway traffic board.

Ed Henen, former city engineer of Great Falls, Mont., and **Albert J. Drazich** have formed the Henen Engineering Co. for the practice of civil engineering with specialties in water and sewer systems design. Drazich was formerly employed in the Great Falls city engineer's office and prior to that was with the Montana state highway commission. Headquarters of the new firm will be in Great Falls.

A. W. Simonds of the United States Bureau of Reclamation has been hired by the engineer's office of Ventura County, Calif., as a consultant on the Matilija Dam project. He is an expert on dam foundation work.

Ralph Ottini, formerly a right-of-way engineer with the Nevada State Highway Department, has been appointed acting traffic engineer in the department. He will conduct special traffic studies in cooperation with the highway planning survey department. He will also be in charge of traffic signs and road striping.

Don A. McKinnon, Helena, Mont., contractor and former Montana state highway engineer, was in Guatemala, Central America, during January, helping to plan a 100-mi. section of the Pan-American highway through that country.

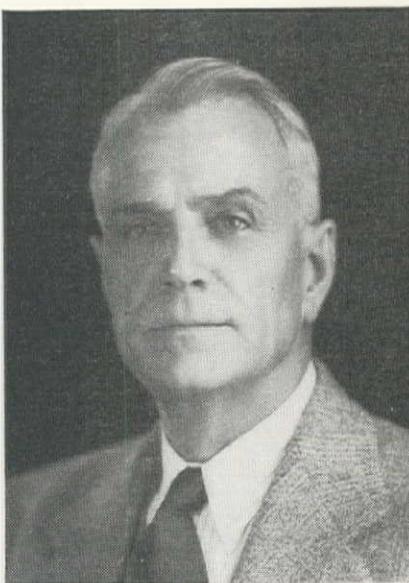
C. R. Whipple, engineer with the Bureau of Reclamation, has been assigned as resident engineer in charge of construction of Dickenson Dam near Dickenson, N. Dak. Whipple was formerly at Missoula, Mont.

R. H. Baldock, Oregon state highway engineer, has been appointed as a member of the advisory board of the section on public works coordination for the commission on organization of the executive branch of the federal government.

C. L. Patterson, chief engineer for the Colorado State Water Conservation Board and long a foremost authority on Colorado water problems, has resigned because of ill health. Patterson has been engineer for the Board since it was created in 1937.

Charles L. Wartelle who resigned as city engineer of Seattle at the close of last year has been retained as consultant to the Seattle city engineering department.

Harry S. Hugill, Boise, Idaho, has been appointed city engineer for Coos Bay, Ore. He succeeds **F. O. McGrew** who resigned several months ago.



DAN B. MILLER

Dan Miller, Managing Engineer of the Pacific Coast Division of the Asphalt Institute, retired at the close of the year after sixteen years of service. Miller, a registered Civil Engineer, organized the division which he managed in 1931. Before that, he was with the Fidelity and Deposit Co. of Maryland specializing in suretyship as applied to construction contracts.

Harold E. Wersen has been appointed district safety engineer for the Columbia Basin project to succeed **Charles C. Parsons**, who has been transferred to the position of regional safety engineer for the Bureau of Reclamation at Billings, Mont. Wersen served as safety engineer at the Todd shipyards in Seattle during the war, and since then has been in private practice in Seattle and instructing in safety at Seattle College.

H. M. Marshall has been appointed county engineer for Okanogan County, Washington, succeeding **Mike Davidson**,

who recently resigned. Marshall was employed by MWAK during the early construction at Grand Coulee dam, and recently has been on the engineering staff at Richland, Wash.

Charles E. Wells has been re-named city manager of Albuquerque, New Mexico, to replace **Colonel Lyle Rosenberg**, who resigned. Wells lost the position after the elections last year.

George W. Stevens, former chief administrator and engineer of Culver City, Calif., took office recently as city manager and administrative officer of Torrance, Calif.

Howard A. Stingle, evaluation engineer for the Washington Water Power Co., at Spokane, has been appointed superintendent of buildings and grounds for school district No. 81 at Spokane.

S. V. Shayler has resigned as city engineer of Kimberley, B. C., to return to the engineering staff of the Consolidated Mining & Smelting Co. at Trail, B. C. Shayler has been city engineer of Kimberley since the incorporation of the city four years ago.

John D. Spaeth, Jr., Buffalo, N. Y., has been appointed director of planning for the Seattle city planning commission. He was formerly chief planner for the city of Buffalo.

T. E. Fennessy has taken office as the city manager of Tulare, Calif., to succeed **Gail Bash**, resigned. Fennessy has been city manager of Las Vegas for the past two years.

Keith A. Murdoch, formerly of Ferndale, Mich., has been appointed city engineer and administrative assistant for Claremont, Calif. The titles are temporary pending passage by the city's council of an ordinance creating the office of city manager.

SUPERVISING THE JOBS

Ed Campbell is the general superintendent for Morrison-Knudsen for work on the Delta-Mendota Canal near Tracy, Calif., being built for the Bureau of Reclamation. **M. H. Hasler** is the project manager and **Art Gray** is engineer. **S. Brown** is cat foreman, **Herman Peschel** is labor foreman, and **Glen Van Landingham** is the chief operator. **George Imrie** is the resident engineer and **Jack Welsh** is the chief inspector.

P. I. Reed is the job superintendent for Del E. Webb Construction Co. of Los Angeles, Calif., on construction of the \$2,103,699 hospital addition for the Veterans' Administration located 4 mi. south of Liver-

more in Alameda County, Calif. **F. W. Danielson** is the job engineer and **I. A. Mabey** is the job office manager. The 119-bed hospital will be of reinforced concrete construction with stucco exterior.

Vince Ninteman is superintendent for Guy E. Hall, Bakersfield contractor, on construction of the housing project at Minter Field near Bakersfield, Calif., for the County of Kern Housing Authority. **Frank E. Barr** is the project manager. Carpenter foremen on the job are **Edward Traum**, **Yuel Smith**, **Murl Ketcham**, **Charles W. Brown** and **R. M. Thompson**. **Paul Bagby** and **Walter Downs** are labor foremen. **J. A. Randall** is the office man-

ager and Robert Hall is timekeeper. **M. N. Boston** is resident engineer on the job, which should be complete by the end of May. The contract to convert former government buildings into 300 apartment units is at a \$683,000 stipend.

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Fred Westlund is general superintendent for the Zoss Construction Co., Hollywood, Calif., on construction of the Veterans' Housing Project at Hansen Dam, Roscoe, Calif., for the Federal Government. **J. J. McNemar** is the project manager. Assistant superintendents are **Joseph Peterson** and **James Goeschl**. Carpenter foremen on the job are **Abraham Harrington**, **Elmo Martin**, **Walter Taylor**, **Henry Kamm**, **Donald Sage**, **Charles Enscoe**, **Ward Gross**, **Henry McGregor**, **Leroy Roth**, **Ray Bayne**, **Clarence Lamberson**, **Elmer Jenkins**, **Laurence Rooney**, **Arthur Andresen**, **James Battle**, **Bert Ritzius** and **H. D. Cox**. Labor foremen are **John Salas**, **Victor Rivas**, **Paul Orrante** and **Simon Salas**. **Jack Stillwell** is material foreman, **William King** is master mechanic and **Ed Stolp** is guard captain. **Al Thomas** is the project accountant and **Richard Jay** is chief timekeeper. The project should be completed in April, 1948.

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General superintendents for the Guy F. Atkinson Co., South San Francisco, on the construction of the Hyperion Outfall Sewer for the City of Los Angeles are **Ed Raimer** on the day shift; **Charlie Reinhart**, swing shift; and **Bob Fitzgerald** on the graveyard shift. **John J. Morton** is the project manager and **Les Freeman** is assistant manager. General foremen on the job are **Dick Carscallen**, **Joe Mabery** and **Charles Hollaman**. Foremen on the pile driving are **Blackie Rogers**, **Robert Homan**, **Cecil Miller**, **Morgan Hayes**, **Elmer Swanson**, **Terrel Leonard**, **Walt Kunath**, **Tommy Gilbert** and **H. F. Conroy**. **P. N. Fletcher** is the project engineer and **C. L. Montgomery** is the master mechanic. Other engineers on the job are **H. E. DeShurley**, **Jerry McLain**, **Howard Thompson** and **Dave Belcher**. **L. A. Cook** is the office manager and **C. L. "Card" Trull** is paymaster. **Hal Hodges** is the warehouseman.

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Key personnel for the U. S. Bureau of Reclamation on construction of the Delta-Mendota Canal near Tracy, Calif., include **O. G. Boden**, construction engineer, **Bernard P. Bellport**, office engineer, and **George C. Imrie**, resident engineer on the canal and the Tracy Pumping Plant. **J. R. Granger** is engineer in charge of the pumping plant, and **H. E. Horton** is the office engineer at the Tracy office. **Harold M. Pearson** is the engineer in charge of the Delta-Mendota Canal location and pre-construction surveys and testing, and **J. W. Peasley** is the engineer in charge of construction surveys. Senior inspectors are **Dee M. Wren**, **A. Z. Greenlaw** and **John J. Welsh**.

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Ray Duckworth is the job superintendent for Olson Construction Co., Salt Lake City, Utah, on the foundation work for a steel fabricating plant southwest of the Salt Lake City limits. **A. L. Abbott** is the carpenter superintendent and **Ralph Johnson** is supervising concrete work on the \$175,000 job.

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George Van Dyl is project manager on the construction of a building for Sears Roebuck & Co. at Ventura, Calif., for Myers Brothers, Los Angeles. **V. A. "Alex" Edgren** is supervising the construction and

C. W. "Bill" Bailey is assistant superintendent. **Cullen Burke** is carpenter foreman and **Felipe Gutierrez** is labor foreman on the job. **S. Peddicord** is office manager on the project which should be completed by July 1. **Van Dyl**, with Myers Bros. for the past 16 years, has been project manager over construction of four of the Sears Roebuck stores built in the Southern California area. **Edgren** has been with Myers Bros. for the past 21 years.

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Jack Taylor is general superintendent for Wm. Radkovich Co., Inc., Los Angeles, on construction of the LeTourneau Houses at the Naval Ordnance Test Station at Inyokern, Calif. **T. H. Harkins** is assistant superintendent, **L. F. Bandholtz** is field superintendent and **M. F. Mattingly** is plumbing superintendent. **Jane P. Wyatt** is the office manager. **Steve E. Bowman** is rigger foreman, **Lonnie L. Reddick** is cement finishing foreman, and **Cecil Johnson** and **George R. Spencer** are labor foremen. **G. A. Bryant** is rodbuster foreman. **H. G. Baumann** is service engineer for LeTourneau on the job. **Thos. D. Toohey** is inspector and **Monty Graff** is chief inspector for the Navy. **Z. O. "Bob" Roberts** is on the job for the Drury Electric Co., subcontractors. The job should be completed by June, 1948.

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J. G. Kathman is superintending the construction of a concrete building in Burbank, Calif., which will be used by the City of Burbank as a Public Service Administration Building, for the Griffith Company, Pasadena. **Rush N. Hill** is foreman on the job for the contractors, and **Carl A. Johnson** is saw man. **J. E. Snider** is the contractor's office manager. **C. Shadel** and **Louis Dolliver** are the resident engineers. **A. E. Loomis** is superintendent for the Soule' Steel Co., subcontractors for the steel work. **John Basso** is on the job for plumbing subcontractors, the Loman Bros.

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John Franks is supervising the hydraulic fill job at Piers B & C, at the outer harbor, Long Beach, Calif., for the Franks Dredging Co. of Long Beach. **Jack Heintz** is the dredge captain on the job, which is being carried out under a \$436,914 contract. **B. L. Ludwigsen** is the chief engineer. **L. W. Jackson** is the timekeeper, and **M. W. Chatten** is purchasing agent and office manager.

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Tony Madrid, superintendent for Underground Construction Co., Oakland, Calif., died recently. He was well-known among construction men in the San Francisco Bay area.

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J. J. Foote is the job superintendent for M. J. King, Inc., contractors and builders of San Francisco, Calif., on construction of 1,500 homes for a residential and commercial center in Sacramento. **Al Quistad** is the carpenter foreman and **Bill Brooks** is the cement finisher foreman. **M. Wickerham** is the purchasing agent.

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C. H. Ingersoll is master mechanic with Marshall, Hass & Royce on the flood-control project at Indio, Calif. **H. L. Stephens** is welder, and **C. Brock** and **Joe Kosata** are mechanics.

✓ ✓ ✓

Ben Williams is project superintendent for Peter Kiewit Sons' Co., Omaha, Neb., who have the contract from the Corps of Engineers for construction of roads and

drainage and storage structures at Albuquerque, New Mexico.

✓ ✓ ✓

Lowell "Blackie" Thomas is tunnel superintendent for Morrison-Knudsen on boring the Union Pacific tunnel through the Uintah mountains in western Wyoming. **Harry Carleton** is project manager for Morrison-Knudsen. **Lester Ashton** is the project engineer for Union Pacific. The tunnel will be 6,700 ft. long and the lining will require 53,500 cu. yd. of reinforced concrete. When the trains eventually commence going under the mountain, the Union Pacific's Omaha-to-Salt Lake City line will be entirely double-tracked for the first time. The contractors say the job will be done in about spring of 1949. Cost is about \$8,000,000.

✓ ✓ ✓

Don Moseley is superintendent for Peter Kiewit Sons' Co., San Francisco, on the grading and surfacing of 4.1 mi. of the highway north of Palm Springs, Calif. **Eugene Hiltunen** is engineer for the contractor and **W. W. White** is the structures superintendent. Carpenter foremen are **Orville Saalfield**, **C. A. McOske** and **Jack Hammond**. **H. W. Hensley** is office manager. **K. B. Stone** is resident engineer for the state on the \$339,458 project.

✓ ✓ ✓

Bill Jibson is superintendent for A. S. Jones, contractor of Niles, Calif., on street grading and paving in San Leandro. **W. B. Brown** is project manager and **Howard Wilson** is the plant foreman. **Dean Follette** is the chief equipment operator.

✓ ✓ ✓

C. E. Copeland is superintendent for Johnson Western Co. on construction of bridges for the State of California near El Cajon. **T. D. High** is foreman and **Oscar A. Johnson** is resident engineer for the state. **E. E. Jackson** has charge of all work for the contractor in the San Diego area.

✓ ✓ ✓

O. E. Petersen is superintending the construction of a store building at Bakersfield, Calif., for Jackson Bros., Los Angeles contractors. The store is being built for the J. C. Penney Co., will be three stories high, of reinforced concrete, and will cost approximately \$500,000. **H. H. Garren** is foreman on the job, and **J. B. Williams** is foreman for the steel reinforcing work. The store will be complete next fall.

✓ ✓ ✓

E. H. Berg is superintendent for contractor Otto Dickscheidt of Santa Barbara, Calif., on the construction of warehouse buildings in Santa Barbara. **Ray Warnock** is superintending the steel work.

✓ ✓ ✓

Jean W. Beatty is superintendent for contractors Ashby & Opperman of Bakersfield, Calif., on construction of a swimming pool and community and shop buildings for the Lakeside Elementary School District in Bakersfield. **Vance Middaugh** is foreman on the job. The job will be complete on about Jan. 1, 1949.

✓ ✓ ✓

Richard E. Hall and **Frank Martin** are superintendents for the Underground Construction Co., Oakland, Calif., on heavy construction near Hayward for the Pacific Telephone & Telegraph Co. **Robert Schraught** is carpenter superintendent and **J. J. McCoy** is carpenter foreman. **Tony Hidalgo** is labor foreman. Other superin-

✓ ✓ ✓

tendents are Peter B. Madrid, D. S. Jacobs and R. M. Ferrow.

Harry A. Brown is the superintendent for contractor Robert E. McKee of Los Angeles, Calif., on construction of the Grandview Pumping Station in Glendale, Calif. L. W. Keith and Bert Kunkle are the carpenter foremen and Ray Cicafoot is labor foreman. James Neilson is superintendent for Al Nehlies & Co., steel contractors on the job.

Jack Holdrege is the superintendent and engineer for Robert E. Campbell Co. of Los Angeles on erection of an addition to the St. Mary's hospital in Long Beach, Calif. Carpenter foremen on the job are

Jim Clark, Loren Heurick and Bob Wolforth. Leo Murray is the labor foreman and Frank Tinnett is the office manager.

M. J. Allred is the superintendent for W. R. Skousen of Mesa, Ariz., who has the contract for grading, placing base and surfacing 5 mi. on Gilbert Rd. between Higley Rd. and Baseline Rd. in Maricopa County, Ariz. D. O. Morris is the mechanic on the job and Joe Krulyac is the purchasing agent for the contractor. Contract price for the job is \$126,435.

Key personnel for the Brighton Sand & Gravel Co. at Sacramento, Calif., include Adam C. Goetz, head superintendent; Lauren R. Groves, superintendent; and S.

E. Dingley, plant superintendent. Hal J. Sims is the company's engineer and Dain J. Domich is the office manager. Allan T. Olson is the owner-manager of the company.

Jack Harlow is superintending the construction of 363 homes at San Lorenzo, Calif. Howard Hall is the structural foreman and carpenter foremen are Gunner Bergman and E. E. Brookshire. Roland Ross is the labor foreman, and Charles Holgren is cement foreman. Robert Shouse is timekeeper and in charge of personnel. The job will begin sometime in the spring.

Axel Matzer is superintending the erection of a Bank of America building located at Yuba city, Calif. Larsen & Larsen, San Francisco, are the contractors. Jim Heath is foreman.

Ed Oaks is superintendent of the ready-mix plant located 5 mi. south of Redding, Calif., where top grade is prepared for work on Highway 99. The plant is owned jointly by G. E. and Ed Oaks. Cecil Pezzale is batch plant foreman and dispatcher and Whity Heff is chief operator.

Neal Wilson is general superintendent for the J. C. Giles Co. on construction of the Memorial Hospital at Tracy, Calif. David Freitas is superintendent and F. G. "Sandy" Heapes is foreman.

Al Hulin is general superintendent for A. Teichert & Son, Inc., Sacramento, on construction of water sewers and streets in Sacramento. W. J. Stitt and Harry Wiksey are foremen on the job. J. Howard Gould is supervising the sewer line construction.

O. H. Whitney is superintending base and surfacing work on 9 mi. of the Benson-Douglas Highway in Cochise County, Ariz., for the Daley Construction-Acme Materials Co. of Phoenix, Ariz. C. A. Roberts is purchasing agent for the contractor on the \$198,394 job.

Earl D. Baker is the job superintendent for Excavators, Inc., on levee work for the Army Corps of Engineers near Oroville, Calif. Fred L. Cherry is the general superintendent and foremen are Kenneth Cline, George Huston, Cecil Herman and Art Root. Tom Morris is master mechanic. Bob Howland is the resident engineer.

Dale Holden is the general superintendent at the sand and gravel plant at Tracy, Calif., for George French, owner. Stan Willey is the foreman, and William Floyd is the master mechanic. Neil Boneelli is equipment foreman and Noah Board is chief operator.

Roy Cummins is superintending construction of the West Point surge chambers, tunnels and power house for M. C. Clingan Steel Co., Inc. This construction is in the Jackson, Calif., area and is being carried out for the Pacific Gas & Electric Co.

Joseph W. Price is resident engineer for the Army Corps of Engineers at the Pacific Overseas Air Materiel Depot at Alameda, Calif.

.38- and .22-cal.
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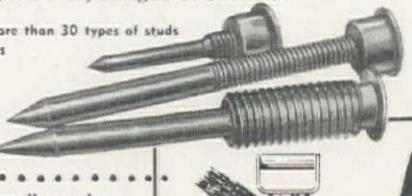
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- 3000 per cent faster, safer, simpler and less costly than any known method of anchoring to concrete, masonry and steel.
- Eliminates expansion bolts, drilling, hammering, electricity, motors and compressors.
- .38-caliber Model — Weight 7 lbs.; Length 17 inches.

Shown here are 3 of the more than 30 types of studs available to DRIVE-IT users



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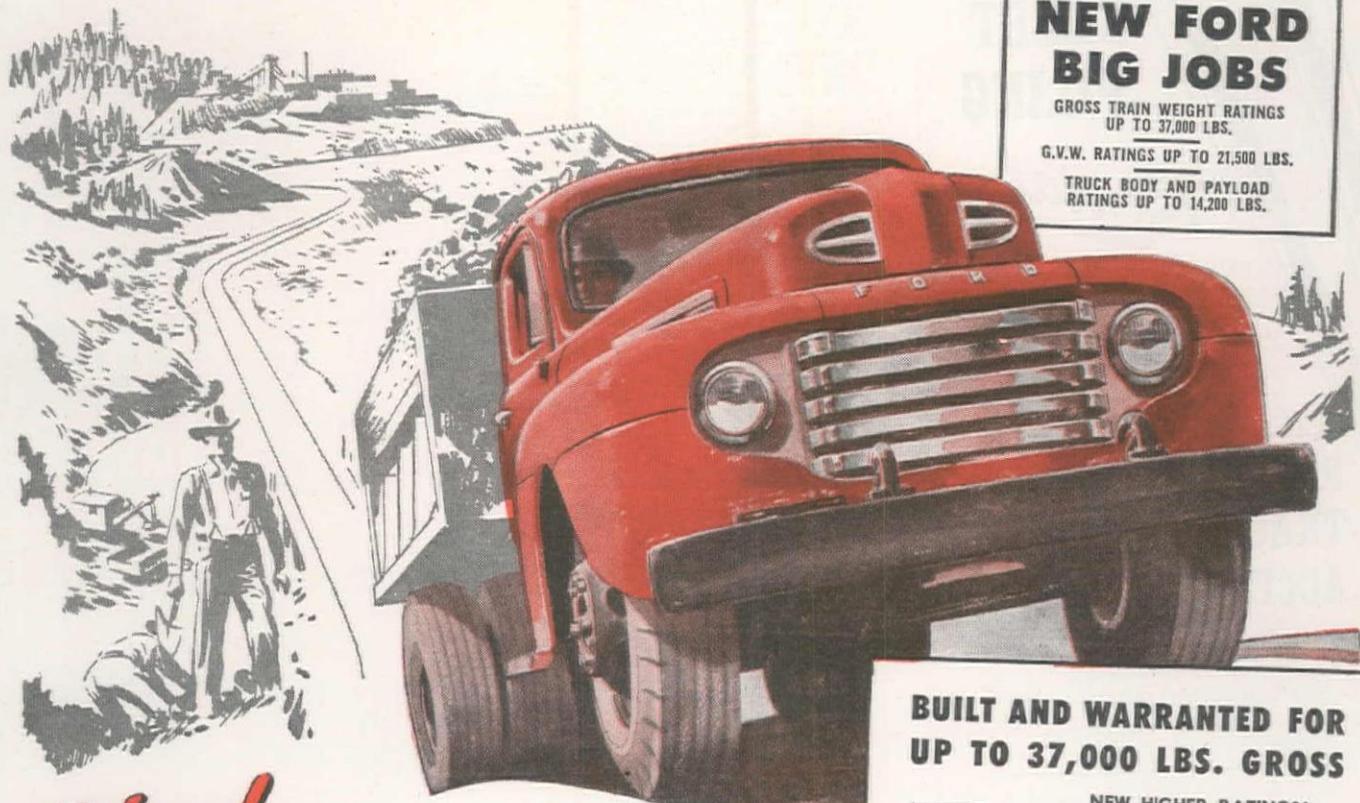
DRIVE-IT carries its own power, a small powder charge in a standard cartridge, which drives the selected stud with a velocity greater than sound into steel or concrete. The stud actually fuses with the material into which it is driven, thus its tremendous holding power. No other method is so SAFE, so SIMPLE, so SPEEDY. Send for complete information showing how others in your field are using this revolutionary tool.

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TRUCK BODY AND PAYLOAD
RATINGS UP TO 14,200 LBS.

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Gross Train Weight up 48%
Gross Vehicle Weight up 42%
Truck Body and Payload up 39%.

Series	Gross Train Weight	Gross Vehicle Weight	Truck Body and Payload
F-7	32,500 lbs.	19,000 lbs.	12,500 lbs.
F-8	37,000 lbs.	21,500 lbs.	14,200 lbs.

145 HORSEPOWER

V-8 TRUCK ENGINE!
45% more horsepower than
"239" V-8! 337 cu. in. displacement.
255 lbs.-ft. torque at
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UNQUALIFIED CUSTOMER
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TRACK
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RAILS—New and Relaying
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UNIT BID SUMMARY

Highway and Street . . .

California—Shasta County—State—Grade & Surf.

Fredrickson Bros., Emeryville, was awarded the \$588,829 contract by the Division of Highways at Sacramento, for about 5.3 mi. of highway between Tower House and Schilling to be graded and surfaced with plant-mixed surfacing on crusher run base. Metal fence posts and straps will be furnished by the State. Unit bids follow:

(1) Fredrickson Bros.	\$588,829	(5) N. M. Ball Sons	\$680,384
(2) Morrison-Knudsen Co., Inc.	628,271	(6) Bressi & Bevanda	683,128
(3) A. Teichert & Son, Inc.	629,304	(7) Harms Bros.	687,689
(4) Fredrickson & Watson Co.	668,739		

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
9 cu. yd. remov. conc.	10.00	20.00	5.00	10.00	8.00	12.00	25.00
70 acres clearing and grubbing	400.00	300.00	320.00	335.00	350.00	290.00	400.00
568,500 cu. yd. rdwy. excav.	.48	.52	.48	.587	.66	.58	.57
4,500 cu. yd. struc. excav.	4.00	2.00	5.00	3.00	4.00	3.25	4.00
3,400 cu. yd. ditch and channel excav.	2.30	1.25	5.00	1.90	2.60	2.35	2.00
2,100,000 sta. yd. overhaul	.008	.01	.01	.006	.004	.005	.01
3,500 sq. yd. compacting orig. ground	.07	.10	.08	.12	.05	.12	.15
14,000 cu. yd. embankment slope protection	.58	.75	.22	.70	.50	.60	.125
31,000 sq. yd. prep. subgr. (Cl. "B" meth. 2)	.09	.10	.09	.10	.10	.10	.10
Lump sum, dev. wat. sup. & furn. wat. equip.	\$2,500	\$3,000	\$8,500	\$3,100	\$1,000	\$3,400	\$10,000
13,000 M. gal. applying water	1.75	1.50	1.30	2.00	1.80	2.00	2.00
281 sta. finishing rdwy.	14.00	15.00	10.00	14.00	15.00	15.00	12.00
30,000 tons crusher run base	2.20	2.50	2.66	2.60	2.00	3.00	2.55
120 tons liquid asphalt, SC-2 (pr. ct.)	29.25	30.00	40.00	32.50	25.00	29.00	32.00
760 tons paving asphalt (P.M.S.)	25.30	25.00	28.00	28.40	25.00	27.00	26.00
15,200 tons mineral aggregate (P.M.S.)	2.90	4.15	3.60	3.65	3.10	4.25	3.35
33,000 lin. ft. shape and compact P.M. dikes.	.12	.15	.18	.24	.10	.20	.20
75 tons liquid asph. ROCR-5 (sl. ct.)	32.10	30.00	40.00	38.00	25.00	35.00	35.00
575 tons screening (sl. ct.)	5.75	5.00	6.50	5.00	6.00	6.00	6.50
6 tons asphaltic emulsion (sl. ct.)	46.00	50.00	40.00	47.00	60.00	40.00	50.00
110 cu. yd. Class "A" P.C.C. (structs.)	62.00	70.00	75.00	65.00	75.00	60.00	70.00
6,700 lbs. bar reinf. steel	.13	.15	.15	.14	.10	.12	.15
13 cu. yd. rubble masonry	40.00	45.00	30.00	30.00	27.00	35.00	40.00
127 ea. monuments	5.75	6.00	6.00	6.00	7.00	5.00	8.00
350 ea. culv. markers and guide posts	5.75	12.00	6.00	5.00	5.00	5.00	6.00
0.98 mi. new prop. fence (Type A)	\$86.00	\$1,500	\$1,000	\$1,180	\$1,200	\$1,400	\$1,500
0.71 mi. new prop. fence (Type B)	\$1,098	\$1,600	\$1,500	\$1,400	\$1,500	\$1,400	\$1,800
1.07 mi. new prop. fence (Type C)	\$1,133	\$1,800	\$1,600	\$1,410	\$1,550	\$1,600	\$1,900
30 ea. drive gates	34.50	35.00	30.00	44.00	47.00	80.00	50.00
1 ea. wall gates	17.10	20.00	15.00	22.00	35.00	30.00	35.00
0.20 mi. remv. & reconstr. exist. prop. fences	\$86.00	\$1,300	\$6,500	\$1,400	\$1,250	\$1,500	\$1,500
140 lin. ft. 8-in. C.M.P. (16 ga.)	1.46	1.50	1.40	1.42	1.50	1.50	1.60
196 lin. ft. 12-in. C.M.P. (16 ga.)	2.10	2.00	2.00	1.84	2.20	2.00	2.00
3,170 lin. ft. 18-in. C.M.P. (16 ga.)	3.15	2.75	2.70	2.62	3.10	2.90	2.80
226 lin. ft. 18-in. C.M.P. (14 ga.)	3.45	3.25	3.20	3.00	3.60	3.30	3.20
330 lin. ft. 18-in. C.M.P. Siphon (16 ga.)	4.75	4.25	4.40	4.25	3.40	4.80	4.00
1,018 lin. ft. 24-in. C.M.P. (14 ga.)	4.50	4.00	4.40	4.00	4.60	5.20	4.00
322 lin. ft. 30-in. C.M.P. (14 ga.)	5.70	5.00	5.30	5.00	5.50	5.50	5.50
112 lin. ft. 36-in. C.M.P. (12 ga.)	8.30	7.00	7.80	7.35	9.10	8.25	8.00
162 lin. ft. 48-in. C.M.P. (12 ga.)	13.00	10.50	11.00	11.25	13.80	10.75	12.00
208 lin. ft. 60-in. C.M.P. (10 ga.)	21.30	18.00	19.00	17.35	19.00	16.25	18.00
146 lin. ft. 60-in. C.M.P. (8 ga.)	24.00	21.00	25.00	20.00	21.00	19.00	21.00
17 ea. field jts. for 18-in. C.M.P. siphons	17.50	11.00	20.00	18.00	15.00	9.00	20.00
4 ea. metal end sects. for 18-in. C.M.P. (16 ga.)	28.75	26.00	30.00	35.00	26.00	20.00	40.00
1 ea. metal end sect. for 24-in. C.M.P. (14 ga.)	46.00	50.00	50.00	53.00	50.00	40.00	60.00
1 ea. metal end sect. for 48-in. C.M.P. (12 ga.)	167.50	225.00	190.00	230.00	170.00	148.00	225.00
134 lin. ft. 84-in. or 90-in. field assembled plate culvert	35.00	40.00	42.00	36.00	50.00	37.50	37.50
144 lin. ft. 120-in. field assembled plate culv.	60.00	65.00	70.00	60.00	78.00	60.00	67.50
20 ea. spillway assemblies	46.00	50.00	30.00	46.60	32.00	25.00	35.00
720 lin. ft. 8-in. C.M.P. down-drns. (16 ga.)	1.50	1.75	1.30	1.53	2.20	1.90	1.60
112 lin. ft. salv. exist. pipe culverts	1.75	1.25	1.50	1.20	1.00	2.50	1.50
30 lin. ft. relaying salv. C.M.P. culverts	1.15	1.25	1.50	1.50	1.00	2.50	1.50
2 ea. Redwood covers	17.50	15.00	15.00	18.00	15.00	15.00	30.00
600 lin. ft. 3/4-in. galvanized steel pipe	.30	.75	.70	.70	.50	1.00	.75
750 lin. ft. 1 1/2-in. galvanized steel pipe	.50	1.00	1.00	1.00	.70	1.10	1.00

Washington—Cowlitz County—State—Grade and Drain

Peter Kiewit Sons Co., Longview, was awarded the \$884,596 contract by the Department of Highways at Olympia, for 1.1 mi. of grading, draining and surfacing of Primary State Hwy. No. 1 and to relocate 1.7 mi. of double railroad track near Carrolls Point, between Kalama River and Longview Wye, Section 1. Time for completion of the project is 450 days. The following unit bids were submitted:

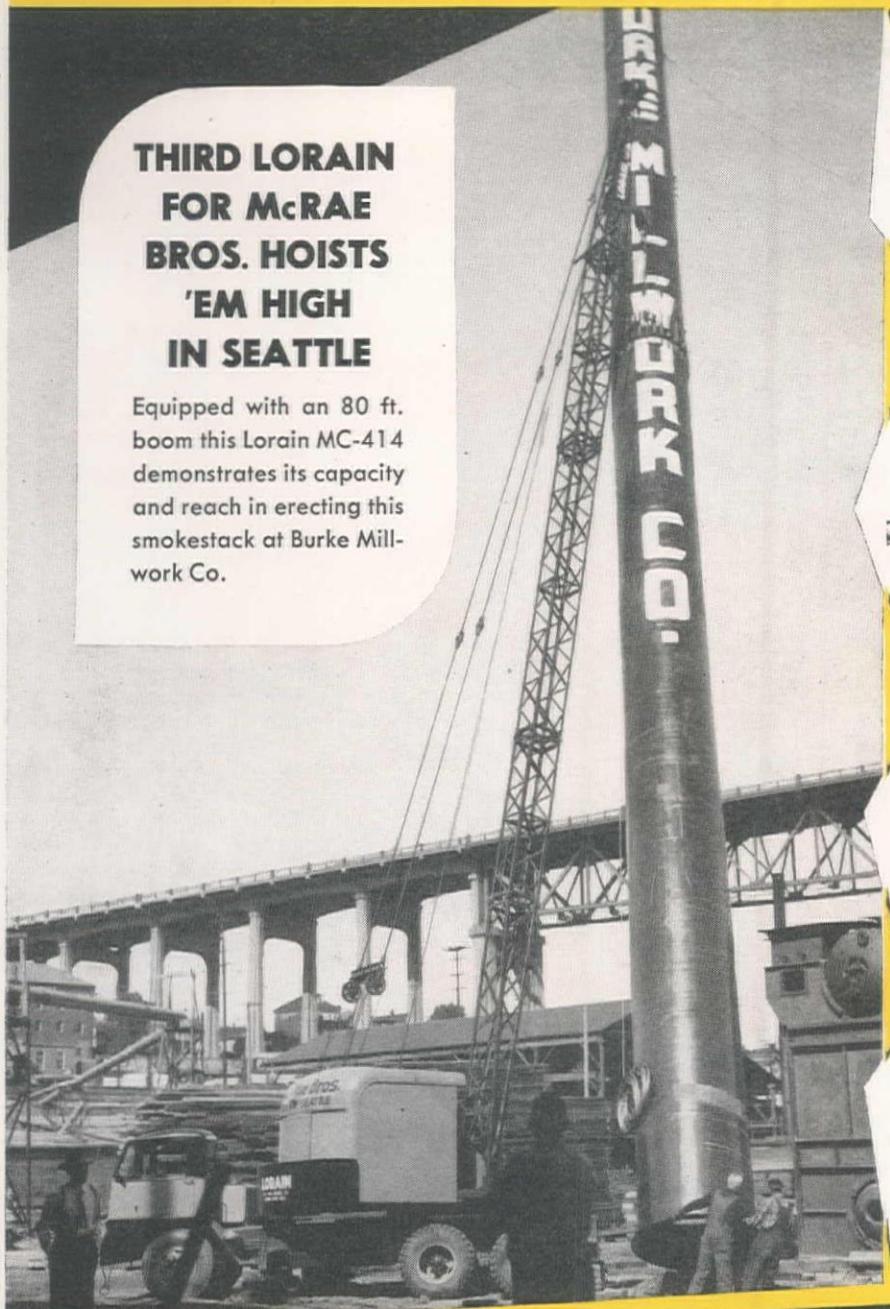
(A) Peter Kiewit Sons Co.	\$ 884,596	(F) Natt McDougall Co.	\$1,299,444
(B) Max J. Kuney Co.	1,099,560	(G) J. A. Terteling & Sons, Inc.	1,361,658
(C) Guy F. Atkinson	1,160,642	(H) K. L. Goulter & Co.	1,371,460
(D) White Bros. Co.	1,185,557	(I) N. Fiorito Co.	1,386,434
(E) Morrison-Knudsen Co., Inc.	1,274,751	(J) Leonard & Slatte Oregon, Ltd.	1,443,219
(1) 34.75 acres clearing		(15) 86,750 cu. yd. selected rock matl. in place	
(2) 9.75 acres grubbing		(16) 1,810 cu. yd. backfill for sand drain in place incl. haul	
(3) 65,120 cu. yd. com. excav. incl. haul of 600 ft.		(17) 1,520 cu. yd. selected roadway borrow in place incl. haul	
(4) 220,060 cu. yd. solid rock excav. incl. haul of 600 ft.		(18) 14,070 cu. yd. selected sand borrow in place incl. haul	
(5) 250 cu. yd. common french excav. incl. haul of 600 ft.		(19) 580 cu. yd. cr. st. surf. top course in place	
(6) 392,710 cu. yd. solid rock borrow incl. haul of 600 ft.		(20) 830 cu. yd. cr. st. surf. base course in place	
(7) 973,370 cu. yd. sta. overhaul on above matl.		(21) 220 cu. yd. sand filled in place incl. haul	
(8) 17,121.01 M. cu. yd. sta. overhaul of above matl.		(22) 37 M. gal. water	
(9) 5,495 cu. yd. struc. excav.		(23) 407.32 cu. yd. conc. Class A in place	
(10) 14,175 lin. ft. excav. sand drain incl. haul		(24) 4.95 cu. yd. conc. Class C in place	
(11) 2,075 lin. ft. slope treat.		(25) 50,902 lb. steel reinf. bars in place	
(12) 169.0 stas. (100) finishing roadway		(26) 25 ea. reinf. conc. r/w markers in place	
(13) 830 cu. yd. gravel backfill in place		(27) 22,015.4 lin. ft. constr. railway track	
(14) 2,530 cu. yd. rock backfill in place		(28) 1,200 lin. ft. constr. and excav. ry. spur track	
		(29) 11,850 cu. yd. special pit run balast in place	

(Continued on next page)

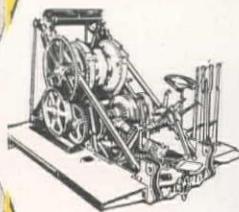
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THIRD LORAIN FOR MCRAE BROS. HOISTS 'EM HIGH IN SEATTLE

Equipped with an 80 ft. boom this Lorain MC-414 demonstrates its capacity and reach in erecting this smokestack at Burke Mill-work Co.

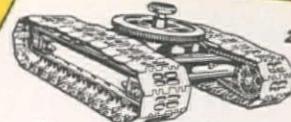


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Center Drive power transmission concentrates power when and where you need it — Balanced design for maximum lifting capacities at minimum weight.



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LaGrande Oregon
CATE EQUIPMENT CO., Salt Lake City 4, Utah
CENTRAL MACHINERY CO. Great Falls and
Havre, Mont.
COAST EQUIPMENT CO. San Francisco 3,
California
A. H. COX & COMPANY Seattle 4, Wash.
P. L. CROOKS & CO., INC., Portland 10, Ore.
LE ROI-RIX MACHINERY CO., Los Angeles 11

LIBERTY TRUCKS & PARTS CO. Denver 1
MOUNTAIN TRACTOR CO. Missoula and
Kalispell, Mont.
LEE REDMAN EQUIPMENT CO. Phoenix,
Arizona
SANFORD TRACTOR & EQUIPMENT CO.
Reno, Nevada
SOUTHERN IDAHO EQUIPMENT CO.
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TRACTOR & EQUIPMENT CO., Sidney, Mont.
Branch: Miles City Equip. Co., Miles City, Mont.
WORTHAM MACHINERY CO. Cheyenne,
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Greybull, Casper and Rock Springs, Wyo.

*We'll help you engineer
the correct pump to
your application*

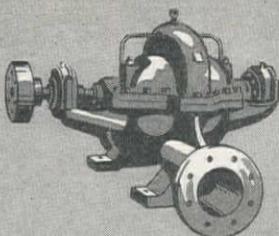
VERTICALS

VERTICAL DEEP WELL AND CLOSE-COUPLED TURBINE PUMPS—HYDRO-FOIL PROPELLER AND MIXED FLOW PUMPS—MINE PUMPS—HI-LIFT PUMPS—UNDERWRITERS' APPROVED VERTICAL FIRE PUMPS—DOMESTIC WATER SYSTEMS.



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Distributors in all Principal Cities

(30) 22,084.4 lin. ft. remov. exist. railway track
(31) Lump sum, remov. exist. railway pile bent trestle
(32) 40 rods remov. and reset. exist. ry. r/w fence
(33) 15 rods ry. r/w fence, compl. in place
(34) 300 lin. ft. beam gd. rl. ty. No. 1 or ty. No. 2 des. No. 6 compl. in place
(35) 397 lin. ft. relay, iron water pipe 1-in. diam.
(36) 468 lin. ft. relay, iron water pipe 2-in. diam.
(37) 20 lin. ft. galv. iron water pipe $\frac{1}{2}$ -in. diam. in place
(38) 89 lin. ft. galv. iron water pipe 1-in. diam. in place
(39) 55 lin. ft. galv. iron water pipe 2-in. diam. in place
(40) 28 lin. ft. pl. corr. mtl. culv. pipe No. 16 ga. 18-in. diam. in place

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	275.00	600.00	475.00	450.00	400.00	465.00	300.00	500.00	500.00	750.00
(2)	200.00	400.00	250.00	350.00	400.00	485.00	300.00	400.00	300.00	600.00
(3)	.68	.50	1.05	.35	.55	.50	.62	.40	.45	1.10
(4)	.68	1.15	1.05	1.15	1.10	1.25	1.34	1.20	1.25	1.10
(5)	1.66	2.00	2.50	1.50	3.00	3.50	1.50	1.00	5.00	2.00
(6)	.68	1.10	1.00	1.00	.95	1.15	1.34	1.15	1.33	1.20
(7)	.008	.005	.007	.01	.025	.01	.015	.02	.02	.02
(8)	8.00	7.00	5.50	5.00	7.50	5.50	5.00	5.50	6.00	12.50
(9)	1.65	3.00	5.00	3.50	7.00	3.25	2.50	3.00	3.00	4.00
(10)	1.25	.50	1.60	1.60	4.00	1.75	2.50	2.50	2.50	2.50
(11)	.15	.20	.50	.20	.25	.25	.10	.30	.30	.20
(12)	12.00	20.00	25.00	15.00	25.00	12.00	10.00	10.00	15.00	20.00
(13)	5.00	3.00	4.00	4.00	6.00	5.00	2.50	5.00	5.00	5.00
(14)	1.65	3.00	3.20	2.50	3.00	3.25	2.50	3.50	2.00	2.50
(15)	1.00	1.30	1.30	2.00	2.00	2.00	1.75	3.00	1.70	1.85
(16)	1.75	3.00	3.80	3.00	7.50	4.20	4.00	5.00	5.00	5.00
(17)	1.35	2.00	2.00	1.50	1.50	2.40	2.50	2.50	2.00	2.50
(18)	1.00	2.00	2.00	1.00	1.70	2.40	2.50	2.50	2.00	1.50
(19)	4.00	3.00	4.50	3.50	4.00	3.35	3.80	4.00	3.50	4.00
(20)	3.60	3.00	4.50	3.50	4.00	3.35	3.80	4.00	3.50	4.00
(21)	3.60	2.00	4.00	2.00	3.50	3.35	1.50	3.00	3.50	3.00
(22)	2.25	5.00	10.00	2.00	3.60	5.00	2.50	3.00	2.00	3.00
(23)	55.00	45.00	60.00	55.00	65.00	65.00	75.00	60.00	70.00	65.00
(24)	75.00	90.00	96.00	55.00	80.00	100.00	76.00	60.00	70.00	75.00
(25)	.12	.09	.10	.10	.14	.125	.112	.12	.112	.112
(26)	5.00	8.00	6.50	4.00	7.00	6.00	5.00	6.00	5.00	10.00
(27)	2.10	1.00	1.00	2.50	1.25	1.40	1.50	1.20	2.00	1.65
(28)	2.80	1.25	3.25	2.00	2.50	2.70	1.75	2.62	4.00	2.75
(29)	.25	.40	2.00	2.00	1.25	2.25	1.50	2.25	2.00	1.00
(30)	.70	.25	1.25	1.00	.75	.70	.50	.58	1.75	1.00
(31)	\$3,500	\$5,000	\$4,200	\$1,500	\$12,500	\$6,500	\$10,000	\$1,000	\$2,000	\$2,500
(32)	3.10	5.00	5.00	5.00	5.00	5.00	2.50	5.00	5.00	5.00
(33)	4.00	5.00	5.00	4.00	5.00	5.00	2.75	5.00	5.00	6.00
(34)	3.00	3.00	3.25	3.00	3.50	5.50	6.00	2.50	3.00	4.00
(35)	1.00	.70	.50	.50	.70	1.50	.50	1.00	1.00	1.00
(36)	1.00	.90	.65	.50	.70	2.00	1.00	1.00	1.50	1.50
(37)	1.00	.60	1.00	.75	1.00	1.00	.50	.50	1.00	1.00
(38)	1.00	.70	1.25	1.00	1.25	1.50	.75	1.00	1.50	1.00
(39)	1.00	1.00	1.40	1.50	1.50	3.00	1.00	2.00	2.00	1.50
(40)	3.25	3.00	3.50	3.50	3.50	3.50	3.65	2.70	3.00	3.00
(41)	20.00	25.00	30.00	20.00	15.00	40.00	15.00	10.00	20.00	25.00
(42)	1.80	2.00	1.70	2.00	1.75	2.00	2.00	1.50	1.50	2.00
(43)	2.15	2.50	2.10	2.25	2.10	2.50	2.35	2.00	1.80	2.50
(44)	3.65	3.50	3.40	4.00	3.50	4.50	4.00	3.50	2.85	4.00
(45)	4.65	5.00	4.30	7.00	4.50	6.50	5.30	5.00	3.75	4.50
(46)	7.20	8.00	7.00	9.00	8.00	10.00	8.25	7.00	5.50	6.50
(47)	10.50	12.00	11.00	12.00	10.50	14.00	10.50	10.00	18.50	10.00
(48)	5.30	6.00	5.25	9.00	5.50	8.00	4.80	6.00	4.25	5.00
(49)	12.00	13.00	12.00	14.00	12.50	16.00	11.50	12.00	10.00	11.00

Waterway Improvement . . .

California—Los Angeles County—Corps of Engineers—River Improvement

Bressi & Bevanda, Constructors, Inc., Los Angeles, were awarded the contract for Los Angeles River improvement by the District Corps of Engineers, Los Angeles. The amount of the contract is \$3,381,174 (Schedule C). Schedule A deals with work from Lankershim Blvd. to Vineland Ave., River Mile 35.40 to River Mile 36.32; Schedule B, Vineland Ave. to Tujunga Wash, River Mile 36.32 to River Mile 37.71; Schedule C is a combination of Schedules A and B. The main features of the work include clearing site and removing of obstructions, excavating, backfill and fill, driving steel sheet and steel bearing piles, temporary railroad trestle and shoofly, sand and gravel filters, installing drain tile, etc. The following contractors submitted unit bids:

	Schedule A	Schedule B	Schedule C
(A) Bressi & Bevanda, Constructors, Inc.	.....	.....	\$3,381,174
(B) United Concrete Pipe Corp., Vinnell Co. and Ralph A. Bell	.....	.....	3,436,400
(C) Morrison-Knudsen Co., Inc.	.....	.....	3,799,227
(D) A. Teichert & Son, Inc.	.....	.....	3,863,706
(E) Macco Corp.	.....	.....	3,990,615
(F) Mitty Bros. Construction Co.	.....	.....	4,111,157
(G) Stoile, Inc., M. & K. Corp. and R. E. Campbell	\$1,764,844	\$2,339,590	4,145,482
(H) Guy F. Atkinson	.....	.....	4,374,936
(I) Matich Bros. & E. L. Yeager	1,605,649	.....	.....
(J) Engineer's Estimate	2,223,974	2,223,974	3,805,962

SCHEDULE A	1250 lin. ft. driving steel bearing batter piles.
(1)	lump sum, diversion and control of water.
(2)	lump sum, clear site and remove obstr.
(3)	473,000 cu. yd. excav.—channel.
(4)	340 cu. yd. excav.—struct.
(5)	5000 cu. yd. excav.—rem. of unsuitable soils.
(6)	excav.—stock pile (none).
(7)	112,000 cu. yd. compacted fill, Class-A.
(8)	5100 cu. yd. compacted fill, Class-B.
(9)	11,400 cu. yd. compacted fill for Valley-Heart extension.
(10)	75 cu. yd. struct. fill.
(11)	44,000 square (100 sq. ft.) addtl. sheep's-foot rolling.
(12)	4480 lin. ft. timber piling.
(13)	2400 lin. ft. driving vert. steel bearing piles.
SCHEDULE B	146 ea. cap for steel bearing pile.
(16)	10 cu. splicing steel bearing pile.
(17)	lump sum, haul equip. for steel bearing pile test.
(18)	lump sum, assembly and disassembly of struct. members for steel bearing pile test.
(19)	1100 sq. ft. steel sheet pile 22-lb. per sq. ft.
(20)	3400 sq. ft. steel sheet pile 32-lb. per sq. ft.
(21)	steel sheet pile 38-lb. per sq. ft. (none).
(22)	19,660 cu. yd. conc. invert slabs.
(23)	700 cu. yd. conc. low water channel walls.
(24)	6900 cu. yd. conc. footings for abutments, piers and walls.
(25)	2120 cu. yd. conc. abutments, piers and walls.
(26)	10 cu. yd. conc. miscel.
(27)	58,500 sq. ft. suction processing of conc.
(28)	51,700 bbl. Portland cement.

(Continued on next page)

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MR. CONTRACTOR: Before you buy construction equipment you judge its value by reputation . . . how well it has served others . . . how well it suits your purpose and how it will perform under all conditions.

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chinery and equipment. Repayment can cover many months and the obligation is liquidated through a series of instalments arranged in amounts to suit your business needs. Any amount required is available promptly at a reasonable cost.

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CONCRETE Cost conclusions

NO CALL to read this column unless you want to. Don't expect high-falutin' talk, I'm just going to try to give you facts. And naturally I'm going to keep on plugging for Atlas Speed Forms—because I think anybody who buys or rents Atlas Forms does himself a favor. If you want to talk back, please go ahead. Glad to hear from you. We'll try to print it, but no guarantee.



TALKING about profits, I've seen profits vary on the same type of poured concrete job, same type of boss, and labor and pay rate. Difference as much as 50% between the costs! What does it? How the job is scheduled, the weather, the accessibility of the location, the morale of the men—anyone with building experience knows the list by heart and can expand it indefinitely.

Here's the point I want to make. With so many factors affecting your profit, how about trying to get a little "profit insurance"? You're much more likely to have a better profit when you use Atlas Speed Forms. And we'll be glad to back you up with the form engineering knowledge we've acquired in many years, solving hundreds of form problems. All you have to do is ask.

When your next poured concrete job comes up, talk it over with us. We'll try to cut corners, save a little for you here and there. It all adds up! If there are tough problems, we can give you the right answers. Send us plans—we can return them in three days. And we'll give you an estimate that may surprise you.



If you think you are saving because you can salvage the lumber used for wood forms, remember that the labor cost of salvage equals original cost of the wood. And how many times can you salvage a piece of wood?



WE'LL be happy to send you, without obligation, our 25 page fully illustrated Erection Manual. Just mail a post card to Irvington Form & Tank Corp., Forms Division, Irvington, N. Y.

- (29) 3,550,000 lb. steel reinf. bar.
- (30) 6400 ea. sleeve for Type-A joint.
- (31) 9800 ea. sleeve for Type-E joint.
- (32) 17,500 cu. yd. drain matl.
- (33) 12,700 cu. yd. filter matl.
- (34) 3950 cu. yd. vert. drain matl.
- (35) 19,500 lin. ft. 8-in. perforated vit. clay pipe drain.
- (36) 400 lin. ft. 12-in. perf. vit. clay pipe drain.
- (37) 78 lin. ft. 12-in. corr. metal pipe.
- (38) 15-in. corr. metal pipe (none).
- (39) 285 lin. ft. 18-in. corr. metal pipe.
- (40) 24-in. corr. met. pipe (none).
- (41) 30-in. corr. met. pipe (none).
- (42) 70 lin. ft. 36-in. corr. met. pipe.
- (43) 44 lin. ft. 42-in. corr. met. pipe.
- (44) 216 lin. ft. 48-in. corr. met. pipe 10-gauge.
- (45) re-lay 18-in. and 36-in. corr. met. pipe (none).
- (46) 28 lin. ft. 78-in. reinf. conc. pipe.
- (47) 12-in. corr. met. pipe inlet sect. (none).
- (48) 24-in. corr. met. pipe inlet sect. (none).
- (49) 55 cu. yd. derrick stone.

SCHEDULE B

Vineland Avenue to Tujunga Wash River Mile 36.32 to River Mile 37.71.

- (1) lump sum, diversion and control of water.
- (2) lump sum, clear site and rem. obstr.
- (3) 332,000 cu. yd. excav.—channel.
- (4) 200 cu. yd. excav.—struct.
- (5) 12,000 cu. yd. excav.—rem. of unsuitable soil.
- (6) 170,000 cu. yd. excav. stock pile.
- (7) 225,000 cu. yd. compacted fill Class-A.
- (8) 89,000 cu. yd. compacted fill Class B.
- (9) compacted fill for Valley-Heart Extension (none).
- (10) 600 cu. yd. struct. fill; install.
- (11) 70,000 square (100 sq. ft.) addtl. sheep's-foot rolling.
- (12) timber piling (none).
- (13) driving vertical steel bearing piles (none).
- (14) driving steel bearing batter piles (none).
- (15) cap for steel bearing pipe (none).
- (16) splicing steel bearing pile (none).
- (17) hauling equipment for steel bearing pile test (none).
- (18) assembly and disassembly of struct. members for steel bearing pile test (none).
- (19) 2860 sq. ft. steel sheet pile 22-lb. per sq. ft.
- (20) 1810 sq. ft. steel sheet pile 32-lb. per sq. ft.
- (21) 3030 sq. ft. steel sheet pile 38-lb. per sq. ft.
- (22) 26,920 cu. yd. conc. invert slabs.
- (23) 1160 cu. yd. conc.—low water channel walls.
- (24) 10,350 cu. yd. conc.—footings for abut., piers and walls.
- (25) 10,280 cu. yd. conc.—abut., piers and walls.
- (26) 20 cu. yd. conc.—miscl.
- (27) 88,000 sq. ft. suction process. of conc.
- (28) 73,100 bbl. Portland cement.
- (29) 5,020,000 lb. steel, reinf. bar.
- (30) 8950 ea. sleeve for Type-A joint.
- (31) 16,030 ea. sleeve for Type-E joint.
- (32) 26,000 cu. yd. drain matl.

SCHEDULE C

Lankershim Boulevard to Tujunga Wash River Mile 35.40 to River Mile 37.71.

- (1) lump sum, diversion and control of water.
- (2) lump sum, clear site and rem. obstr.
- (3) 805,000 cu. yd. excav.—channel.
- (4) 540 cu. yd. excav.—struct.
- (5) 17,400 cu. yd. excav.—rem. of unsuitable soils.
- (6) excav.—stock pile (none).
- (7) 337,000 cu. yd. compacted fill Class-A.
- (8) 94,100 cu. yd. compacted fill Class-B.
- (9) 11,400 cu. yd. comp. fill for Valley-Heart Extension.
- (10) 675 cu. yd. struct. fill.
- (11) 114,000 square (100 sq. ft.) addtl. sheep's-foot rolling.
- (12) 4480 lin. ft. timber piling.
- (13) 2400 lin. ft. driv. vert. steel bearing piles.
- (14) 1250 lin. ft. driv. steel bearing batter piles.
- (15) 146 ea. cap for steel bearing pile.
- (16) 10 ea. splicing steel bearing pile.
- (17) lump sum, haul. equip. for steel bearing pile test.
- (18) lump sum, assembly and disassembly of struct. members for steel bearing pile test.
- (19) 3960 sq. ft. steel sheet pile 22-lb. per sq. ft.
- (20) 5210 sq. ft. steel sheet pile 32-lb. per sq. ft.
- (21) 3030 sq. ft. steel sheet pile 38-lb. per sq. ft.
- (22) 46,580 cu. yd. conc.—invert slabs.
- (23) 1860 cu. yd. conc.—low water channel walls.
- (24) 17,250 cu. yd. conc.—footings for abut. piers and walls.
- (25) 17,490 cu. yd. conc.—abut., piers and walls.
- (26) 30 cu. yd. conc.—miscl.
- (27) 146,500 sq. ft. suction processing of conc.
- (28) 124,800 bbl. Portland cement.
- (29) 8,570,000 lb. steel reinf. bar.
- (30) 15,350 ea. sleeve for Type-A joint.
- (31) 25,830 ea. sleeve for Type-E joint.
- (32) 43,500 cu. yd. drain matl.

SCHEDULE A

	(G)	(I)	(J)
(1)	60,000	50,000	90,600
(2)	20,559	12,500	16,500
(3)	.54	.46	.44
(4)	7.00	7.00	8.05
(5)	1.39	1.50	1.40
(6)	....	....	....
(7)	.70	.60	.54
(8)	.88	1.00	.80
(9)	1.26	.30	.28

- (10) 10,000 lin. ft. channel fencing.
- (11) 35 sq. ft. brickwork in wall openings.
- (12) lump sum, rem. piers 2 and 3, Pacific Electric Bridge.
- (13) lump sum, rem. 2 piers, Vineland Avenue Highway Bridge.
- (14) lump sum, trestle timberwork.
- (15) lump sum, struct. steel work for Pacific Electric Bridge.
- (16) 80 sq. yd. 3-in. bitum. surf.
- (17) 1400 gal. oil for surf.
- (18) lump sum, rem. temp. protect. from station 592+00.
- (19) gaging station (none).
- (20) 425 lin. ft. rem. conc. curb.
- Alternate for Item No. 35
- (21) 19,500 lin. ft. 8-in. perforated asbestos-bonded corrug. metal pipe.
- Alternate for Item No. 36
- (22) 400 lin. ft. 12-in. perforated asbestos-bonded corr. met. pipe.

- (33) 17,900 cu. yd. filter matl.
- (34) 6500 cu. yd. vert. drain matl.
- (35) 32,300 lin. ft. 8-in. perf. vit. clay pipe drain.
- (36) 12-in. perf. vit. clay pipe drain (none).
- (37) 78 lin. ft. 12-in. corr. met. pipe.
- (38) 15 lin. ft. 15-in. corr. met. pipe.
- (39) 80 lin. ft. 18-in. corr. met. pipe.
- (40) 310 lin. ft. 24-in. corr. met. pipe.
- (41) 190 lin. ft. 30-in. corr. met. pipe.
- (42) 83 lin. ft. 36-in. corr. met. pipe.
- (43) 42-in. corr. met. pipe (none).
- (44) 48-in. corr. met. pipe, 10-gauge (none).
- (45) 82 lin. ft. relay 18-in. and 36-in. corr. met. pipe.
- (46) 78-in. reinf. conc. pipe (none).
- (47) 1 ea. 12-in. corr. met. pipe inlet sect.
- (48) 2 ea. 24-in. corr. met. pipe inlet sect.
- (49) derrick stone (none).
- (50) 16,180 lin. ft. channel fencing.
- (51) 25 sq. ft. brickwork in wall openings.
- (52) removing piers 2 & 3, Pacific Electric Bridge (none).
- (53) removing 2 piers, Vineland Avenue Highway Bridge (none).
- (54) trestle timberwork (none).
- (55) struct. steel work for Pacific Electric Bridge (none).
- (56) 3-in. bitum. surf. (none).
- (57) oil for surf. (none).
- (58) rem. temp. protec. from station 592+00 (none).
- (59) lump sum, gaging station.
- (60) rem. conc. curb (none).
- Alternate for Item No. 35
- (61) 32,300 lin. ft. 8-in. perforated asbestos-bonded corr. met. pipe.
- Alternate for Item No. 36
- (62) 12-in. perforated asbestos-bonded corr. met. pipe (none).

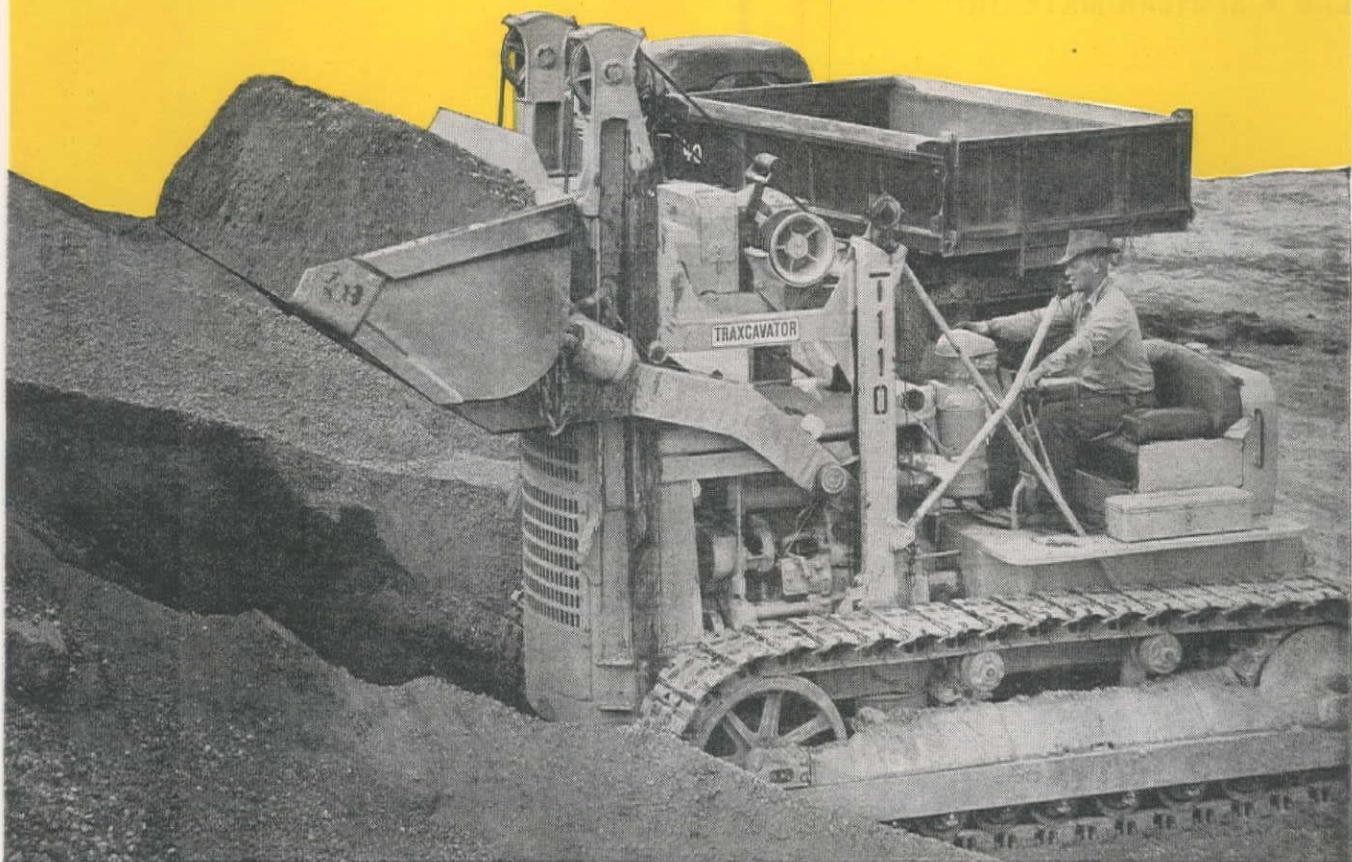
- (33) 30,600 cu. yd. filter matl.
- (34) 10,450 cu. yd. vert. drain matl.
- (35) 51,800 lin. ft. 8-in. perf. vit. clay pipe drain.
- (36) 400 lin. ft. 12-in. perf. vit. clay pipe drain.
- (37) 156 lin. ft. 12-in. corr. met. pipe.
- (38) 15 lin. ft. 15-in. corr. met. pipe.
- (39) 365 lin. ft. 18-in. corr. met. pipe.
- (40) 310 lin. ft. 24-in. corr. met. pipe.
- (41) 190 lin. ft. 30-in. corr. met. pipe.
- (42) 153 lin. ft. 36-in. corr. met. pipe.
- (43) 44 lin. ft. 42-in. corr. met. pipe.
- (44) 216 lin. ft. 48-in. corr. met. pipe, 10 gauge.
- (45) 82 lin. ft. re-lay 18-in. and 36-in. corr. met. pipe.
- (46) 28 lin. ft. 78-in. reinf. conc. pipe.
- (47) 1 ea. 12-in. corr. met. pipe inlet section.
- (48) 2 ea. 24-in. corr. met. pipe inlet section.
- (49) 55 cu. yd. derrick stone.
- (50) 26,180 lin. ft. channel fencing.
- (51) 60 sq. ft. brickwork in wall openings.
- (52) lump sum, rem. piers 2 and 3, Pacific Electric Bridge.
- (53) lump sum, rem. 2 piers, Vineland Avenue Highway Bridge.
- (54) lump sum, trestle timberwork.
- (55) lump sum, struct. steel work for Pacific Electric Bridge.
- (56) 80 sq. yd. 3-in. bitum. surf.
- (57) 1400 gal. oil for surf.
- (58) lump sum, rem. temp. protec. from station 592+00.
- (59) lump sum, gaging station.
- (60) 425 lin. ft. rem. conc. curb.
- Alternate for Item No. 35
- (61) 51,800 lin. ft. 8-in. perforated asbestos-bonded corr. met. pipe.
- Alternate for Item No. 36
- (62) 400 lin. ft. 12-in. perforated asbestos-bonded corr. met. pipe.

- (10) .44 3.00 1.90
- (11) .15 .03 .07
- (12) 2.27 2.54 1.80
- (13) 3.00 1.94 2.10
- (14) 4.00 3.28 2.55
- (15) 15.00 17.50 10.50
- (16) 10.00 37.00 14.00
- (17) 500.00 200.00 475.00
- (18) 3.00 750.00 240.00
- (19) 3.00 3.00 2.60
- (20) 3.60 4.20 3.15

(Continued on next page)

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LOADING aggregate from stockpiles as pictured above is an easy and efficient TRAXCAVATOR job. Their direct, powerful digging action gets big bucket loads quickly . . . from toughest earth, shale, clay, blasted rock and frost . . . digs profit from any job. But that's only part of the TRAXCAVATOR story. For they are known throughout your industry for their versatility . . . dig, grade, load, bulldoze, level, spread, strip, carry and haul . . . in fact they do more different kinds

of jobs at lower cost than any other machine of comparable size, power and capacity. TRAXCAVATORS, powered by "Caterpillar" track-type tractors are available in four sizes with bucket capacities ranging from $\frac{1}{2}$ to 4 cubic yards. There's a size and type for every job and purpose. See your TRACKSON—"Caterpillar" dealer about time-and-money saving ways to use TRAXCAVATORS, or write direct to TRACKSON COMPANY, Dept. WC-38, Milwaukee 1, Wisconsin.

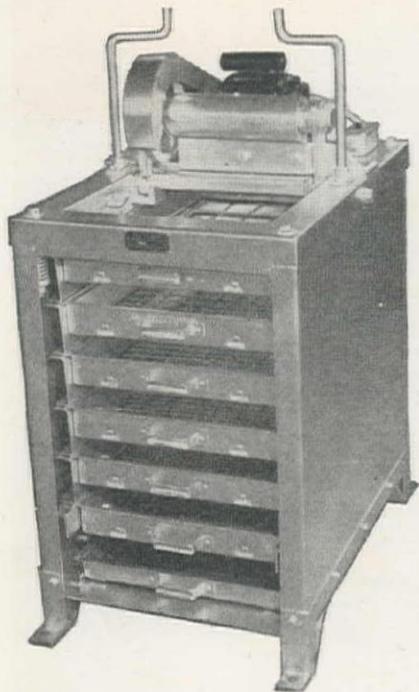
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REG. U. S. PAT. OFF.
The Original Tractor Excavator

GILSON

Mechanical Testing Screen

For CRUSHED STONE • GRAVEL
SLAG • SIMILAR MATERIALS



SPEEDY • ACCURATE

**Check and Compare these
GILSON features**

- ✓ 2 to 7 separations simultaneously
- ✓ Size range 4" to 200 mesh
- ✓ Samples in 3 minutes
- ✓ Visible separation to refusal
- ✓ Screen trays independently removable
- ✓ Trays adjustable to same fare weight
- ✓ Sturdy construction
- ✓ Few moving parts

**WRITE TODAY FOR COMPLETE DESCRIPTIVE
LITERATURE AND INFORMATION**

GILSON SCREEN CO.
BOX 186 MERCER, PA.

(21)	11.15	9.30	10.05	(42)	15.00	14.00	14.00
(22)	37.64	39.00	34.50	(43)	20.00	25.00	19.00
(23)	12.95	12.00	10.70	(44)	20.00	21.00	16.30
(24)	24.32	24.50	28.15	(45)			
(25)	65.00	100.00	70.00	(46)	100.00	40.00	31.50
(26)				(47)			
(27)	.126	.16	.13	(48)			
(28)	3.50	3.33	2.80	(49)	7.50	10.00	5.60
(29)	.085	.084	.08	(50)	.70	.77	1.06
(30)	.60	.63	.73	(51)	5.00	1.00	4.30
(31)	.70	.30	.54	(52)	2,000	6,000	6,900
(32)	4.16	3.85	4.00	(53)	2,500	4,325	4,750
(33)	4.03	3.00	3.30	(54)	12,500	11,300	14,200
(34)	8.75	5.50	5.15	(55)	10,000	14,000	4,800
(35)			1.38	(56)	2.50	3.50	2.05
(36)			2.32	(57)	.25	.30	.15
(37)	3.28	3.10	3.50	(58)		3,500	1,500
(38)				(59)			
(39)	4.41	4.50	4.10	(60)		1.00	.50
(40)				(61)		2.60	2.85
(41)				(62)		3.50	3.00

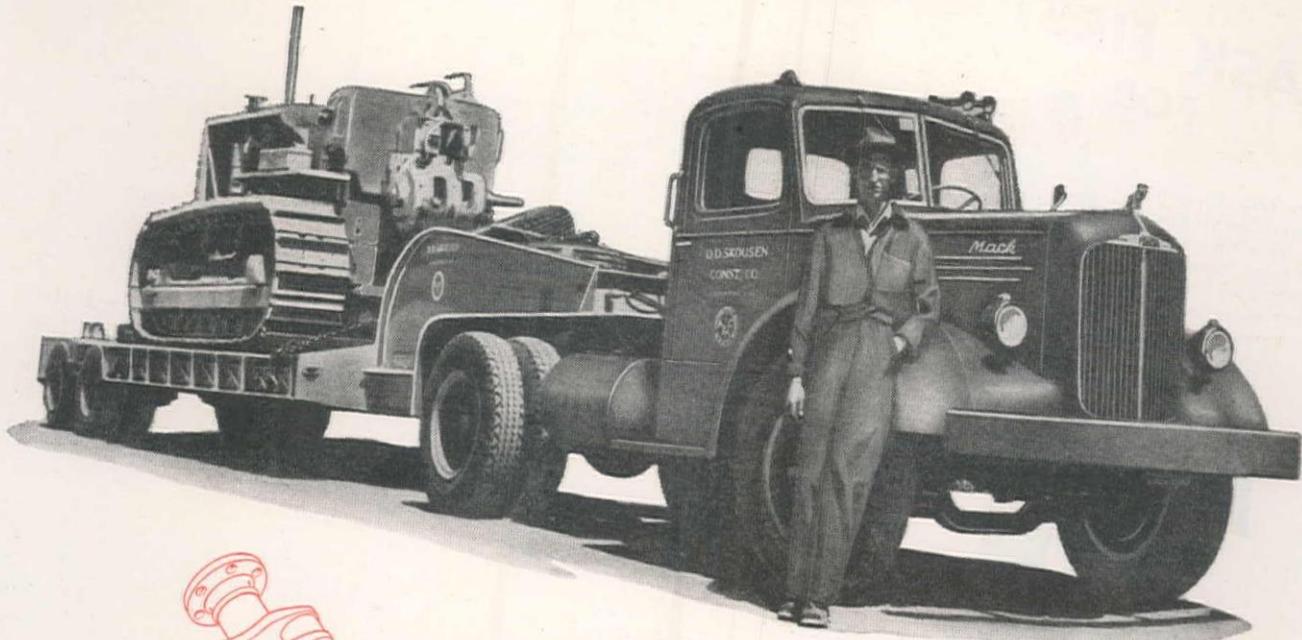
SCHEDULE B

	(G)	(J)	(31)	.70	.54
(1)	70,000	90,600	(32)	4.16	4.00
(2)	30,629	20,800	(33)	4.03	3.30
(3)	.54	.59	(34)	8.75	5.15
(4)	7.00	8.05	(35)		1.38
(5)	1.39	1.46	(36)		
(6)	.25	.33	(37)		
(7)	.70	.54	(38)		
(8)	.88	.80	(39)		
(9)			(40)		
(10)	.44	1.90	(41)		
(11)	.15	.07	(42)		
(12)			(43)		
(13)			(44)		
(14)			(45)		
(15)			(46)		
(16)			(47)		
(17)			(48)		
(18)			(49)		
(19)	3.00	2.60	(50)		
(20)	3.60	3.15	(51)		
(21)	4.00	3.70	(52)		
(22)	11.15	10.05	(53)		
(23)	37.64	34.50	(54)		
(24)	12.95	10.70	(55)		
(25)	24.32	28.15	(56)		
(26)	65.00	70.00	(57)		
(27)	.126	.13	(58)		
(28)	3.50	2.80	(59)		
(29)	.085	.08	(60)		
(30)	.60	.73	(61)		
			(62)		

SCHEDULE C

(1)	100,000	120,000	144,000	100,000	45,000	120,000	110,000	125,000	178,000
(2)	75,000	100,000	50,000	150,000	44,000	85,000	51,188	100,000	37,300
(3)	.41	.47	.53	.70	.47	.60	.54	.53	.50
(4)	3.50	10.00	6.00	10.00	6.00	7.00	7.00	4.00	8.05
(5)	1.00	.80	1.00	1.00	.90	1.10	1.39	1.40	1.46
(6)	.10	.25	.30	.20	.57	.40	.25	.30	.33
(7)	.37	.30	.60	.70	.43	.60	.70	.35	.54
(8)	.26	.40	.15	.70	.23	.50	.88	.40	.80
(9)	.26	.30	.15	.50	.20	.30	1.26	.50	.28
(10)	3.00	3.00	2.50	5.00	4.00	3.00	.44	4.00	1.90
(11)	.05	.03	.10	.03	.04	.05	.15	.06	.07
(12)	2.25	1.50	2.00	1.50	2.00	1.50	2.27	1.10	1.80
(13)	3.50	.80	3.00	1.50	2.70	2.00	3.00	1.60	2.10
(14)	4.00	1.10	3.50	1.50	3.50	2.50	4.00	2.00	2.55
(15)	15.00	10.00	20.00	15.00	12.00	12.00	15.00	15.00	10.50
(16)	15.00	10.00	30.00	20.00	15.00	12.00	10.00	15.00	14.00
(17)	500.00	500.00	325.00	200.00	200.00	800.00	500.00	200.00	475.00
(18)	1,200	500.00	500.00	1,000	1,500	1,200	3,000	400.00	240.00
(19)	3.00	1.50	3.00	2.50	2.60	2.50	3.00	2.50	2.60
(20)	3.50	2.50	4.00	3.00	3.50	3.60	2.75	3.15	
(21)	4.00	3.00	4.50	3.50	4.00	3.80	4.00	3.00	3.70
(22)	10.00	11.20	9.50	8.00	11.00	13.50	11.15	13.00	10.05
(23)	32.00	40.00	50.00	28.00	33.00	33.00	37.64	50.00	34.50
(24)	12.50	11.80	14.00	12.00	14.00	15.00	12.95	15.00	10.70
(25)	18.50	15.50	21.00	29.00	26.00	25.00	24.32	35.00	28.15
(26)	65.00	50.00	50.00	100.00	60.00	85.00	65.00	40.00	70.00
(27)	.10	.10	.12	.15	.14	.15	.126	.15	.13
(28)	3.10	3.50	3.45	3.10	3.40	3.20	3.50	3.50	2.80
(29)	.075	.0725	.075	.08	.08	.08	.085	.09	.08
(30)	.35	.20	.50	.12	.40	.60	.60	.25	.73
(31)	.35	.25	.50	.13	.40	.50	.70	.40	.54
(32)	3.30	3.20	4.00	4.00	5.00	4.80	4.16	4.50	4.00
(33)	3.00	2.61	4.00	3.50	4.00	4.40	4.03	3.50	3.30
(34)	4.00	4.00	4.00	6.00	6.00	5.80	8.75	6.00	5.15
(35)									3.25
(36)									4.00
(37)	4.00	4.00	2.50	5.00	4.00	4.00	3.28	4.00	3.50
(38)	4.50	5.00	3.00	6.00	5.00	6.00	4.54	7.00	4.10
(39)	5.00	6.00	4.00	7.00	6.40	7.00	4.41	7.00	4.10
(40)	7.00	7.00	6.00	11.00	9.00	8.00	7.56	9.00	6.40
(41)	10.50	10.00	10.00	13.00	12.50	15.00	11.34	13.00	10.75
(42)	13.50	15.00	12.00	19.00	15.00	18.00	15.00	16.00	14.00
(43)	17.00	20.00	20.00	19.00	26.00	20.00	18.00	19.00	
(44)	20.00	25.00	22.00	22.00	19.00	27.00	20.00	25.00	16.30
(45)	3.50	7.00	3.00	5.00	6.00	10.00	4.00	6.00	2.25
(46)	36.00	40.00	30.00	60.00	40.00	35.00	100.00	45.00	31.50
(47)	20.00	100.00	50.00	50.00	30.00	150.00	25.00	30.00	
(48)	35.00	200.00	75.00	60.00	50.00	225.00	50.00	50.00	40.00
(49)	5.00	7.00	10.00	10.00	10.00	12.00	7.50	14.00	5.60
(50)	.70	.70	1.00	.70	.70	.65	.70	.78	1.06
(51)	5.00	5.00	10.00	6.00	3.00	6.00	5.00	7.00	4.30
(52)	6,000	11,000	3,000	5,000	8,000	4,000	2,000	3,000	6,900
(53)	3,500	10,000	3,000	2,000	10,000	2,700	25,000	2,500	4,750
(54)	12,000	21,000	12,000	8,000	15,000	17,750	12,500	11,000	14,200
(55)	8,000	10,000	9,000	8,000	12,000	12,500	10,000	9,000	4,800
(56)	5.00	5.00	1.00	3.00	4.00	5.00	2.50	7.00	2.05
(57)	.20	.20	.15	1.00	.15	.20	.25	.20	.15
(58)	2,500	1,000	4,000	500.00	2,000	3,500	3,500	2,000	1,960
(59)	10,000	12,000	12,800	10,000	10,000	11,900	7,500	8,400	8,850
(60)	2.90	.50	2.00	1.00	.40	1.00	425.00	.40	.72
(61)	2.50	1.70	2.35	1.80	2.40	2.05	2.60	2.75	1.82
(62)	3.00	2.20	3.50	2.50	3.00	3.15	3.50	3.20	2.35

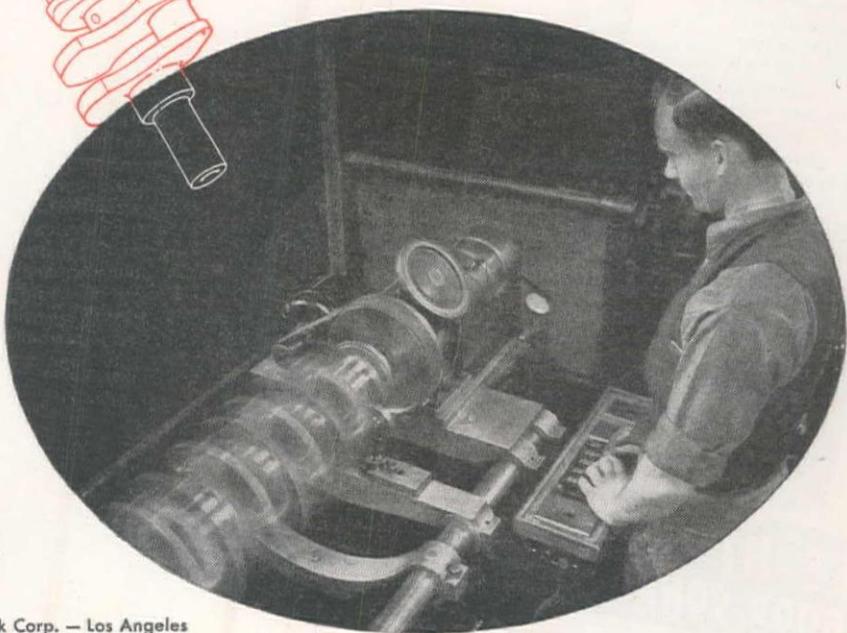
you get more work **out** of Mack Trucks



Work done on the job is the one true yardstick of truck value. On tough construction hauls, operators like D. D. Skousen Const. Co., Albuquerque, N. M., find that Mack trucks give full measure—and more—in extra work, enduring reliability and rock-bottom maintenance costs.

because...we put more work **into** Macks

True Dynamic Crankshaft Balance assures smooth running and prolonged bearing life. This highly sensitive balancing machine determines exact adjustments needed in the counterweights for perfect running balance. A calibrated drilling machine then removes metal from the weights as electrically indicated and the final result is again checked.



Mack

Mack-International Motor Truck Corp. — Los Angeles
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in all principal cities for service and parts.

Trucks for

Every Purpose

SINCE 1900, AMERICA'S HARDEST-WORKING TRUCK

March, 1948—WESTERN CONSTRUCTION NEWS

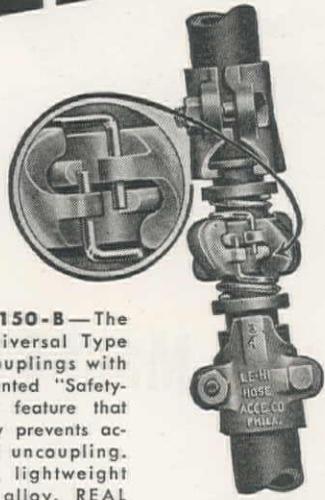
6230-4

**ASK FIRST
FOR**



Series 650 Type BC
—Brass Combination Male Hose Nipple, the ideal nipple connection for petroleum products, for salt water and certain corrosive liquids. Sizes 1" to 6" I.P.T.

LE-HI



Series 150-B—The only Universal Type Hose Couplings with the patented "Safety-locking" feature that positively prevents accidental uncoupling. Rugged, lightweight bronze alloy. REAL SAFETY for operators. Interchanges and locks with other standard couplings. Hose sizes $\frac{1}{2}$ ", $\frac{3}{4}$ " and 1".

**BRASS
HOSE
COUPLINGS**

Series 800—Brass Suction or Water Discharge Hose Coupling—Pin Lug Type. For hose sizes from $\frac{1}{4}$ " to 6" I.P.T. Also made in Garden or Heavy Duty Water Hose sizes $\frac{1}{2}$ " to 1" with hexagon or octagon swivel nut.



**LE-HI MAKES A
GOOD CONNECTION!**



Ask your local distributor for these tough, dependable LE-HI Hose Couplings — NEVER SOLD DIRECT.

HOSE ACCESSORIES CO.
2756 North 17th Street
Philadelphia 32, Pennsylvania

Oregon—Coos County—Corps of Engineers—Rock Removal

San Francisco Bridge Co., San Francisco, Calif.; and Standard Dredging Corp., Los Angeles, Calif., submitted the low bid of \$2,198,950 to the District Corps of Engineers at Portland, for the removal of rock and overburden to a depth of at least 30 ft. below the mean lower low water through certain areas in the Coos Bay, channel from Guano Rock near Mile No. 1 to a point below Empire at about Mile No. 4.5 and for disposition of all excavated materials. Section A (items 1 and 2) is to be completed in 230 calendar days after receipt of notice to proceed. Section B (items 3, 4 and 5) is to be completed by 1,080 calendar days after receipt of notice to proceed. Unit bids are as follows:

(1) San Francisco Bridge Co. and Standard Dredging Corp.	\$2,198,950	(4) Ben C. Gerwick, Inc.; Geo. Pollock; J. H. Pomeroy & Co., Inc.; M&K Corp.	\$4,398,150
(2) Puget Sound Bridge & Dredging Co., and Macco Corp.	2,694,265	(5) Engineer's Estimate.....	3,349,650
(3) General Construction Co.	3,224,180		

		(1)	(2)	(3)	(4)	(5)
Excavation and disposal of rock and overburden at Guano Rock, Section A, 15,000 cu. yd.		22.00	30.00	44.44	20.00	23.45
Excavation and disposal of material in overburden at Guano Rock, Section A, 5,000 cu. yd. Place measure; maximum allowable overdepth excavation for this item is 10,000 cu. yd.		22.00	30.00	44.44	30.00	23.45
Dredging and disposal of overburden Mile 2 to Mile 4.5, Section B to F, inclusive, 550,000 cu. yd.		4.30	.50	.77	1.90	.32
Excavation and disposal of rock to 30-ft. depth, Mile 2 to Mile 4.5, Section B to F, inclusive, 294,000 cu. yd.		4.30	7.47	3.73	1.90	7.30
Excavation and disposal of rock in overdepth, Mile 2 to Mile 4.5, Section B to F, inclusive, 76,500 cu. yd. (maximum allowable overdepth excavation for this item is 102 cu. yd.)		4.30	2.00	3.73	1.90	7.30

California—San Diego County—Corps of Engineers—Jetties

The Macco Corp. of Clearwater submitted the low bid of \$1,117,900 to the District Corps of Engineers, Los Angeles, for the construction of downcoast and middle jetties for the San Diego River and Mission Bay project, San Diego. The work involves construction of approximately 5,120 lin. ft. of stone jetty at the ocean entrance to Mission Bay. Time allowed for completion of the project is 540 days. Unit bids were submitted as follows:

(1) Macco Corp.	\$1,117,900	(5) Guy F. Atkinson Co.	\$1,770,000
(2) Matthew S. Ross.	1,347,400	(6) M. H. Golden Construction Co.	1,844,760
(3) A. Teichert & Son, Inc.	1,565,900	(7) Engineer's Estimate	1,382,280
(4) V. R. Dennis Construction Co.	1,678,600		

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
23,000 cu. yd. excav. ....	.30	.50	1.00	1.00	.50	.72	.76
120,000 tons core stone	2.80	3.38	3.75	3.50	3.75	4.61	3.37
50,000 tons Class A stone	2.80	3.66	4.15	4.98	4.50	4.95	3.64
170,000 tons Class A-1 stone	3.30	3.89	4.62	4.98	5.45	5.33	3.98
20,000 tons Class A-2 stone	3.70	4.30	5.00	7.00	7.85	6.07	5.09

Sewerage . . .

California—Los Angeles County—City—Sanitary

Martin Construction Co., Inc., Montebello, has been awarded a \$467,162 contract by the City Board of Public Works of Los Angeles, for the installation of sanitary sewers in Kester Ave., between Lassen St. and Burbank Blvd., Van Nuys district, Los Angeles. 270 days are allowed for completion. This is a cash contract. The following unit bids were submitted:

(A) Martin Construction Co., Inc.	\$467,162	(F) P. & J. Artukovich, Inc.	\$625,791
(B) Artukovich Bros.	508,550	(G) MacDonald & Kruse, Inc. & Hensler Construction Corp.	737,425
(C) Bebek & Brkich	515,548	(H) Engineer's Estimate	526,101
(D) R. A. Wattson Co.	571,880		
(E) V.C.K. Construction Co.	600,571		

(1) 9,194 lin. ft. 30-in. extra str. pipe sewer.		(13) 1 unit junct. chamber "F" (betw. Lassen St. and Roscoe Blvd.)	
(2) 9,530 lin. ft. 27-in. extra str. pipe sew. (betw. Roscoe and Burbank Blvds.)		(14) 13 units junct. chamber "G" (betw. Roscoe-Burbank Blvds.)	
(3) 2,634 lin. ft. 27-in. extra str. pipe sew. (betw. Lassen St. and Roscoe Blvd.)		(15) 6 units junct. chamber "G" (betw. Lassen St. and Roscoe Blvd.)	
(4) 4,289 lin. ft. 24-in. extra str. pipe sewer.		(16) 1 unit junct. chamber "H" (betw. Roscoe and Burbank Blvds.)	
(5) 1,088 lin. ft. 15-in. extra str. pipe sewer.		(17) 1 unit junct. chamber "H" (betw. Lassen St. and Roscoe Blvd.)	
(6) 11 lin. ft. 8-in. extra str. pipe sewer.		(18) 3 units drop manhole "S"	
(7) 16 lin. ft. 8-in. standard str. pipe sewer.		(19) 1 unit special trap manhole	
(8) 2,260 vert. ft. 6-in. chimney pipe "E".		(20) 2,837 sq. ft. Class "C" resurf.	
(9) 2,826 cu. yd. Class "D" conc. for pipe reinf.		(21) 46,103 sq. ft. Class "AC-4" resurf.	
(10) 23 units manhole "B" (betw. Roscoe and Burbank Blvds.)		(22) 1,014 sq. ft. Class "AC-8" resurf.	
(11) 19 units manhole "B" (betw. Lassen St. and Roscoe Blvd.)			
(12) 22 units junct. chamber "F" (betw. Roscoe and Burbank Blvds.)			

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
(1)	14.35	15.78	15.50	18.00	19.35	22.00	25.00	17.75
(2)	13.35	14.00	13.50	16.00	16.17	16.50	19.50	12.80
(3)	13.00	13.00	13.50	15.00	16.17	15.50	19.50	12.50
(4)	9.35	11.50	11.50	13.75	13.20	13.50	17.00	10.25
(5)	7.35	9.00	8.50	12.00	9.85	11.00	17.00	6.00
(6)	4.35	8.00	4.50	5.00	8.15	6.00	10.00	7.00
(7)	3.60	7.50	4.50	4.50	8.00	5.50	10.00	5.95
(8)	5.00	5.00	7.50	4.50	5.00	10.00	6.00	5.00
(9)	12.00	12.50	15.00	12.00	15.00	12.00	16.00	20.00
(10)	275.00	350.00	250.00	325.00	375.00	400.00	350.00	400.00
(11)	275.00	350.00	250.00	325.00	375.00	375.00	350.00	375.00
(12)	300.00	350.00	260.00	325.00	400.00	390.00	350.00	385.00
(13)	300.00	350.00	260.00	325.00	400.00	395.00	350.00	385.00
(14)	320.00	350.00	265.00	325.00	400.00	370.00	350.00	375.00
(15)	300.00	350.00	265.00	325.00	400.00	370.00	350.00	365.00
(16)	400.00	350.00	275.00	325.00	415.00	380.00	350.00	460.00
(17)	300.00	350.00	275.00	325.00	415.00	385.00	350.00	345.00
(18)	350.00	400.00	300.00	350.00	600.00	450.00	400.00	445.00
(19)	400.00	450.00	500.00	425.00	\$1,000	500.00	\$1,750	680.00
(20) ....	.65	.75	.75	.60	.50	.50	.75	.50
(21) ....	.30	.20	.40	.25	.30	.18	.35	.25
(22) ....	.70	.75	.75	.50	.50	.25	.60	.50

Arizona—Maricopa County—City—Replacements

J. H. Welsh, Phoenix, was low before the City Council of Phoenix, with the bid of \$189,933 for the installation of sewer replacements in Phoenix. All pipe is to be supplied by the City of Phoenix. The following unit bids were submitted:

(Continued on next page)

Why Chemicals Have Been Added to Motor Oil

Shell scientists believe you should really know about the new motor oils... to guard your engines... to save you dollars



Some chemicals are "inhibitors"

Some keep the oil from *foaming*. Others keep acids from forming... acids that might corrode and rust the insides of an engine. Still other and newer inhibitors (first developed by Shell Research) keep motor oil from "oxidizing"... from breaking down under heat and moisture into dirt and sludge.

Golden Shell Motor Oil, of course, has both

Shell scientists have tested and checked every known inhibitor and detergent. They have chosen a number of the best of these additives for Golden Shell Motor Oil — each to do a special job. Shell Research has combined these "bests" in the unique New-Formula Golden Shell Motor Oil.

As engine power output has been stepped up... and speed increased... the size of engines has become smaller. And moving parts have been made to fit tighter and tighter.

So motor oils today must stand up under far greater heat than before. They have to get into tinier places to lubricate. They have to keep dirt from forming. They even have to "wash" the engine.

That's why chemicals have come into the motor oil picture. It has been found that certain chemicals can be added to motor oil to do these extra jobs.

Other chemicals are "detergents"

They dissolve dirt, acids and carbon which form on the pistons and cylinder walls of the engine. Detergents hold these deposits in the oil... carry them away when the oil is drained.



GOLDEN SHELL MOTOR OIL

a development of Shell Research

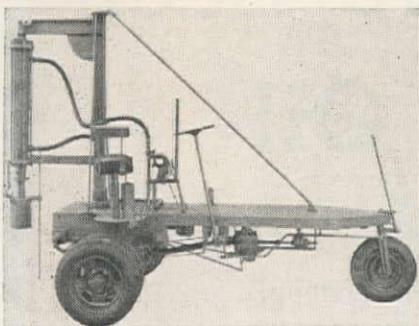
ARE YOU ABSOLUTELY SURE YOU ARE GETTING ALL THAT'S NEW IN LUBRICATION?

Your Shell Lubrication Engineer can make a complete study and analysis of your plant and machines... give you engineering counsel, advice on new lubricants and their application... help you set up schedules and controls for each and every machine. For that kind of service — call in your Shell Lubrication Engineer.



BREAK PAVEMENT

the low cost way!



RAPID PAVEMENT BREAKER
cuts concrete and tamps backfill
... will break inside floor and
vertical walls. Cost of breaking
and tamping is one-sixth to
one-tenth other methods.

WRITE FOR COMPLETE
INFORMATION

R.P.B. CORPORATION

2751 EAST 11th STREET • LOS ANGELES, CALIFORNIA



BLADE EDGES
GUARANTEED SPLIT-PROOF

INGERSOLL SHOVELS
"The Borg-Warner Line"

SMITH BOOTH USHER COMPANY, Distributor
Los Angeles, Calif.
Factory Representative:
John F. Kegley & Son, Los Angeles, Calif.

(1) J. H. Welsh	\$189,933	(5) Fisher Contracting Co.	\$256,632
(2) Tiffany Construction Co.	229,570	(6) Vinson Construction Co.	263,721
(3) Peter J. Foskin	234,090	(7) Mark Cockrell Co.	275,673
(4) Arizona Concrete Pipe Co.	251,480		

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
39,500 cu. yd. excav.	1.29	1.70	1.65	1.78	2.26	2.00	1.63
5,800 sq. yd. pave. cut and repl., type "A"	6.00	4.00	4.25	3.98	4.57	4.00	5.00
300 sq. yd. pave. cut and repl., type "B"	7.00	6.00	7.50	12.00	5.80	7.00	7.50
100 sq. yd. pave. cut and repl., type "C"	8.50	10.00	10.00	15.00	6.40	12.50	8.00
45 sq. yd. pave. cut and repl., type "D"	7.00	8.00	9.50	11.50	6.75	8.00	10.00
106 sq. yd. pave. cut and repl., type "E"	8.50	11.00	12.00	14.50	7.75	12.00	11.00
190 sq. ft. sidewalk cut and repl.	.50	1.00	.60	1.50	.65	.90	1.00
60 lin. ft. curb and gutter cut and repl.	4.00	3.00	3.50	6.15	2.70	2.00	6.00
2,660 lin. ft. install 36-in. vit. clay pipe	3.26	4.50	4.25	4.85	5.88	5.50	4.40
4,610 lin. ft. install 33-in. vit. clay pipe	3.02	4.30	4.25	4.54	5.11	5.50	4.30
5,910 lin. ft. install 30-in. vit. clay pipe	2.60	4.00	5.00	4.29	4.23	5.00	4.20
5,490 lin. ft. install 27-in. vit. clay pipe	2.25	3.75	4.00	4.16	3.45	4.00	3.80
1,200 lin. ft. install 24-in. vit. clay pipe	1.95	3.00	3.00	3.23	2.20	3.00	2.80
10 lin. ft. install 18-in. vit. clay pipe	1.95	5.00	4.00	2.50	2.00	7.50	2.50
6,160 lin. ft. install 15-in. vit. clay pipe	1.41	1.25	1.20	2.06	1.17	1.20	1.30
4,375 lin. ft. install 12-in. vit. clay pipe	1.39	.90	1.10	.89	.90	1.20	1.10
1,530 lin. ft. install 10-in. vit. clay pipe	.90	.80	1.05	.71	.73	.90	.90
800 lin. ft. install 8-in. vit. clay pipe	1.30	.70	1.00	.54	.82	.80	.80
1,510 lin. ft. install 6-in. vit. clay pipe	1.85	.80	1.50	.98	1.35	.90	1.29
120 lin. ft. install & encase 33-in. vit. clay pipe	18.00	30.00	25.00	24.74	24.80	40.00	157.09
20 lin. ft. install & encase 15-in. vit. clay pipe	19.80	12.00	14.00	21.49	9.70	30.00	20.00
25 lin. ft. 24-in. conc. pipe	4.32	5.00	5.00	9.38	5.40	5.00	5.00
55 lin. ft. 18-in. conc. pipe	3.14	4.00	3.00	6.25	5.00	4.50	4.00
100 lin. ft. 12-in. conc. pipe	1.70	2.00	2.50	4.38	3.40	4.00	3.50
80 manholes	209.00	200.00	175.00	215.00	273.00	200.00	362.95
1 unit manhole No. 1	524.00	\$1,000	700.00	\$1,362	\$1,045	\$1,000	\$1,286
51 units, reconstr. manholes	40.00	250.00	240.00	139.01	68.00	300.00	398.75
2 units, break out and fill manholes	82.00	200.00	300.00	196.04	102.00	500.00	300.00
1 unit, reconstr. manhole at 3rd and Roosevelt Sts.	390.00	700.00	500.00	266.66	245.00	500.00	597.50
1 unit, removal of manhole	122.00	200.00	270.00	127.28	68.00	200.00	300.00
180 units, for service change-overs	18.70	25.00	20.00	74.64	28.50	25.00	40.00
1 unit, storm sewer siphon manhole at 17th Ave. and alley north of Adams	704.00	300.00	350.00	499.74	400.00	400.00	400.00

Dam . . .

Nebraska—Harlan County—Corps of Engineers—Earth & Concrete

Guy F. Atkinson Co., San Francisco, Calif.; Bressi & Bevanda Constructors, Inc., Los Angeles, Calif.; Chas. L. Harney, Inc., San Francisco, Calif.; W. E. Kier Construction Co., San Diego, Calif.; A. Teichert & Son, Inc., Sacramento, Calif.; David G. Gordon, Denver, Colo. and Trepte Construction Co. of San Diego, Calif., joint venturers, were awarded a contract in the amount of \$19,432,386 by the Corps of Engineers, Kansas City, Mo., for the completion of the earth and concrete Harlan County Dam, located on the Republican River approximately eight miles east of Alma, and 75 miles southwest of McCook. The work includes clearing of the site, excavation, embankment, slope protection and drainage, roads, parking areas, mass and reinforcing concrete, spillway bridge and approaches, sluice gate hydraulic system, tainter gates and miscellaneous items of work including the installation of Government furnished sluice gates. Unit bids are as follows:

(1) Guy F. Atkinson, Bressi & Bevanda, Chas. L. Harney, W. E. Kier, A. Teichert & Son, David G. Gordon, Trepte Construction Co.	\$19,432,386
(2) Morrison-Knudsen Co., Inc. & Peter Kiewit Sons Co.	20,178,626
(3) S. J. Groves & Sons, Bowen & McLaughlin, Johnson, Drake & Piper, Chas. H. Tompkins Co., C. F. Lytle Co., & D. W. Winkelmann Co., Inc.	21,529,672
(4) Union Constructors, Inc.	24,644,676
(5) Engineer's Estimate	16,251,682

	(1)	(2)	(3)	(4)	(5)
Lump sum, clearing of site.	\$13,800	\$50,000	\$35,000	\$22,000	\$5,245
2,531,000 cu. yd. excav., foundation.	.35	.50	.52	.37	.245
147,000 cu. yd. excav., cutoff trench.	.50	1.75	1.20	2.30	1.158
133,500 cu. yd. excav., shale	.60	1.45	1.50	2.20	.542
300,000 cu. yd. genl. excav., chalk	1.30	1.45	1.80	1.95	2.167
9,000 cu. yd. trench excav., chalk	11.00	15.00	15.00	10.00	12.357
1,810,000 cu. yd. excav., Bor. Area A.	.36	.44	.55	.40	.387
3,158,000 cu. yd. excav., Bor. Area B.	.34	.40	.40	.37	.315
2,912,000 cu. yd. excav., Bor. Area C.	.37	.42	.43	.34	.323
638,000 cu. yd. excav., Bor. Area D.	.37	.45	.42	.37	.326
965,000 cu. yd. excav., Bor. Area E.	.36	.41	.49	.25	.257
709,000 cu. yd. excav., Bor. Area F.	.40	.47	.52	.45	.447
2,800 cu. yd. excav., unclass.	1.65	.80	3.00	.65	.625
8,645,000 cu. yd. fill, impervious.	.15	.13	.115	.17	.108
987,000 cu. yd. fill, pervious	.15	.10	.112	.17	.123
989,000 cu. yd. fill, berms.	.06	.09	.09	.09	.054
45,000 sq. yd. foundation, cleanup	1.40	4.68	2.00	6.00	1.357
6,000 sqs. liquid sealing solution	5.00	3.40	4.00	9.50	19.42
500,000 lb. excav., bracing	.11	.12	.10	.16	.148
59,000 cu. yd. spalls	7.90	7.60	7.50	10.80	5.63
186,000 cu. yd. riprap	7.80	7.85	8.50	13.30	5.63
84,000 cu. yd. topsoil	.65	1.28	.90	.60	.82
100 acres spot sodding, mulching	\$1,200	400.00	300.00	\$1,000	168.14
500,000 sqs. rolling addtl. 2 trips	.02	.03	.015	.02	.024
Lump sum, dewatering Bor. Area A.	\$185,250	\$299,290	\$224,000	\$560,000	\$382,052
Lump sum, dewatering Closure area	\$90,000	\$145,000	\$80,000	\$85,000	\$37,624
Lump sum, cleanup of closure area	\$25,000	\$11,000	\$35,000	\$15,000	\$80,111
145,000 sq. ft. prep. vert. chalk fences.	.70	.50	.40	.94	1.01
340,000 cu. yd. mass concrete, dam.	11.20	8.50	11.50	14.90	7.86
11,000 cu. yd. concr., spillway piers.	25.50	18.00	20.00	24.35	25.59
31,000 cu. yd. concr., training walls	10.35	12.00	19.00	16.52	7.78
43,000 cu. yd. concr., in stilling basin	14.00	14.00	19.00	18.00	8.36
650 cu. yd. concr., rdwy., sidewalks and handrail posts	80.00	80.00	64.00	34.07	49.07
1,000 cu. yd. concr., spillway bridge	65.00	70.00	65.00	51.76	65.07
200 cu. yd. concr. in thin slabs, beams, cols. and walls	100.00	90.00	100.00	101.69	88.00
3,200 cu. yd. concr., misc. structures	52.50	50.00	64.00	28.49	18.13
400,000 bbl. Portland cement	3.90	3.50	3.50	3.70	3.60
260 bags cem., grout for outfall pav.	5.00	5.15	5.00	3.63	2.22
15,000 bags cem., pressure grouting	2.50	3.90	3.00	4.20	2.46
4,710,000 lb. steel, reinf.	.11	.12	.12	.137	.089
7,000 lb. metal fabric	.16	.20	.19	.30	.095
36,000 lb. steel pipe handrail	.77	.64	.48	.75	.227
26,500 lb. aluminum handrail	3.00	3.25	3.00	3.93	3.02
16,500 lb. misc. iron castings	.45	.40	.30	.36	.324
19,000 lb. misc. brass and bronze	1.60	1.00	1.50	2.20	.481
210,000 lb. misc. steel pipe, fittings	.45	.30	.25	.53	.162
73,000 lb. misc. steel castings	.63	.90	.80	.91	.513

(Continued on next page)

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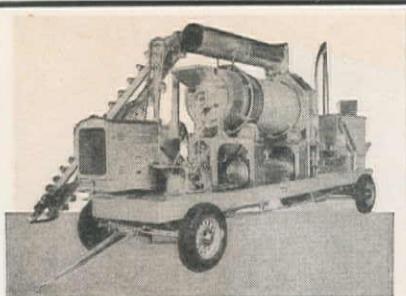
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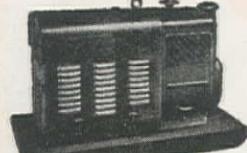
White Mfg. Co.

ELKHART

INDIANA

64,000 lb. misc. steel	.39	.40	.30	.38	.204
74,000 lb. lead	.56	.30	.30	.42	.203
4,000 lb. zinc	.56	.50	.64	.98	.552
900,000 lb. spillway br. struc. steel	.19	.19	.20	.176	.164
1,410,000 lb. tainter gate struc. steel	.30	.309	.25	.35	.32
510,000 lb. tainter gate semi-corrosion resisting steel	.33	.33	.30	.442	.352
39,000 lb. tainter gate stainless steel	1.54	1.60	1.30	1.81	.797
22,000 lb. tainter gate steel forgings	.56	.80	.45	.89	.389
3,500 lb. rubber seals, molded	3.50	2.00	2.20	2.36	2.23
8,500 lin. ft. copper water stops	3.85	5.60	4.80	5.55	2.64
8,200 lin. ft. drill 2-in. grout holes	1.75	2.84	3.00	3.02	1.24
1,400 lin. ft. drill 3-in. drain holes	3.50	4.40	3.50	4.79	1.34
28,000 lin. ft. drill 3-in. weep holes	2.00	2.20	2.40	2.18	1.46
36,000 lin. ft. drill, grout 6-in. anchor holes	2.50	4.90	4.00	5.24	3.37
1,300 lin. ft. drill, grout 6-in. holes	7.00	5.25	5.00	5.50	6.39
110 lin. ft. tile gages	14.00	30.00	40.00	30.00	8.68
800 lin. ft. safety treads	2.80	2.00	3.20	2.22	1.33
725 lin. ft. 24-in. pipe drain	10.00	7.00	8.00	7.60	6.87
1,430 lin. ft. 30-in. pipe drain	12.00	8.80	11.20	8.90	8.68
Lump sum, removal and relocation of exist. 18-in. arch pipe culverts	700.00	\$1,080	480.00	786.00	83.40
1,100 lin. ft. 4-in. perf. vit. clay pipe	1.05	1.60	.96	1.73	.94
19,870 lin. ft. guard rail	2.80	3.00	2.40	2.70	1.80
525 lin. ft. wood curb	2.10	2.00	2.72	3.30	1.57
475 lin. ft. masonry wall	25.00	30.00	40.00	19.87	11.74
450,000 sq. ft. absorptive form lining	.22	.30	.32	.27	.24
23 sqs. outfall paving	91.00	150.00	96.00	95.75	102.10
9,300 tons coarse aggregate, base	7.00	6.00	7.00	8.00	5.17
2,850 tons choker stone	7.00	6.00	7.00	8.00	5.52
2,950 tons combined aggreg., bit. mat.	8.40	8.80	8.00	9.28	4.40
450 tons cover aggregate	9.00	12.00	7.00	7.54	3.90
400 cu. yd. crushed stone for drains	9.00	10.00	7.00	16.28	7.18
46,500 gal. MC-3 cutback asphalt	.21	.21	.25	.22	.125
17,500 gal. MC-1 cutback asphalt	.25	.21	.25	.22	.125
10,000 gal. RC-3 cutback asphalt	.28	.22	.25	.22	.13
Lump sum, install sluice gates, conduit liners, hoists and gate hangers	\$58,500	\$90,500	\$40,000	\$132,132	\$49,946
Lump sum, irrig. conduit slide gates	\$34,500	\$35,400	\$30,000	\$37,013	\$15,783
Lump sum, irrig. conduit liners	\$12,075	\$10,400	\$16,000	\$10,563	\$5,223
Lump sum, piezometer, settlement gages	\$40,250	\$37,000	\$89,000	\$53,325	\$29,324
Lump sum, tainter gate operating machinery	\$473,685	\$543,000	\$550,000	\$650,000	\$313,548
Lump sum, aerial elec. systems	\$20,470	\$28,400	\$20,000	\$30,674	\$15,837
Lump sum, spillway power-lighting sys.	\$88,900	\$106,040	\$80,000	\$125,770	\$56,637
Lump sum, standby engine generator unit	\$3,450	\$10,600	\$2,500	\$4,341	\$1,274
Lump sum, oil pumps, piping system	\$17,825	\$27,000	\$25,000	\$82,390	\$18,494
Lump sum, chain hoists	\$2,875	\$2,240	\$2,800	\$3,461	\$1,982
Lump sum, sump pumps, motor, controls	\$5,750	\$12,600	\$8,000	\$23,453	\$6,333
Lump sum, water line to adit bldg.	\$10,350	\$17,400	\$16,000	\$13,494	\$6,319
Lump sum, water sys. in galleries	\$10,350	\$4,600	\$6,400	\$11,758	\$4,806
Lump sum, enclosed stairway, adit bldg. and adits	\$8,625	\$14,200	\$12,800	\$22,520	\$6,051
Lump sum, water level recorder, well and piping	\$2,530	\$4,960	\$3,360	\$11,753	\$1,350
Lump sum, water level recorder, transmitter and indicators	\$2,300	\$3,830	\$1,600	\$4,467	\$1,202
Lump sum, sewage disposal facilities	\$1,825	\$1,130	\$4,000	\$4,464	657.59
Lump sum, gate service truck	\$2,300	\$1,380	\$1,450	\$4,798	577.48
Lump sum, air vent piping	\$26,450	\$49,700	\$32,000	\$94,517	\$17,409
Lump sum, approach channel const. bridge	\$57,500	\$63,900	\$70,000	\$62,212	\$49,154
Lump sum, remove constr. bridges	\$11,500	\$27,600	\$8,000	\$20,606	\$2,150

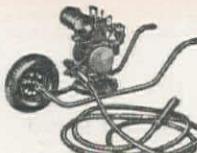
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Gas or Electric Grinding Machines and Power Tools (Catalog No. 683)



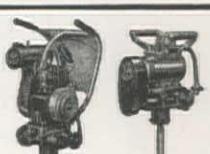
BIG-3 for Generation, Tool Operation and Concrete Vibration (Catalog No. 687)



Hand Tools for all Master Vibrators, BIG-3, and Grinding Machines (Catalog No. 683)



"Power-Blow" Electric Hammer and Spade (Catalog No. 688)



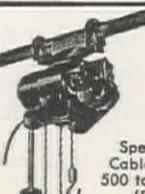
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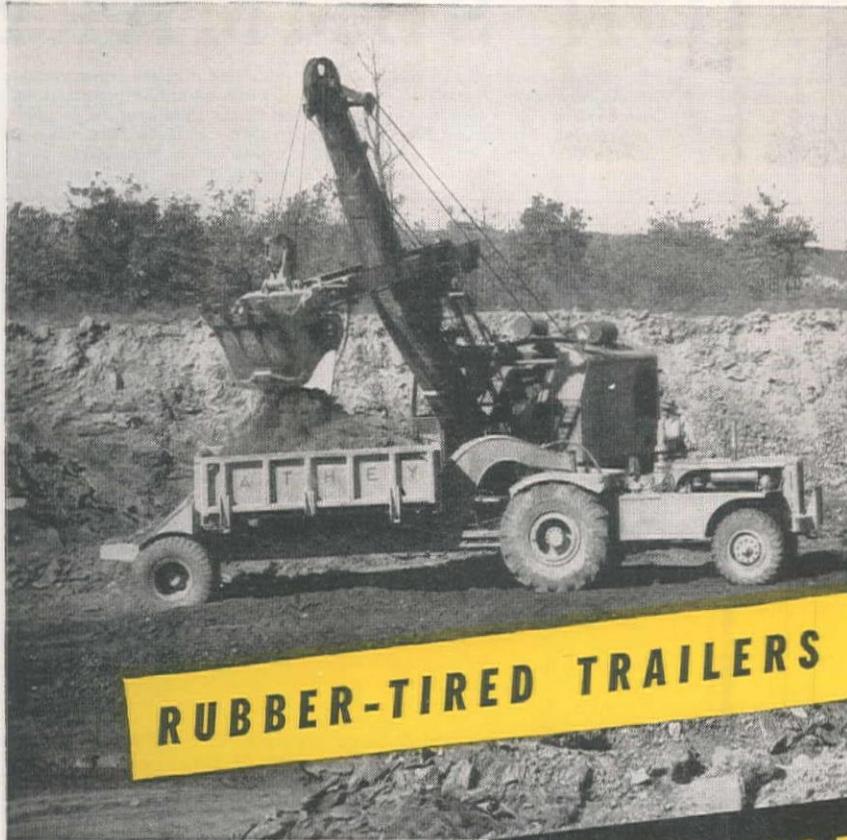


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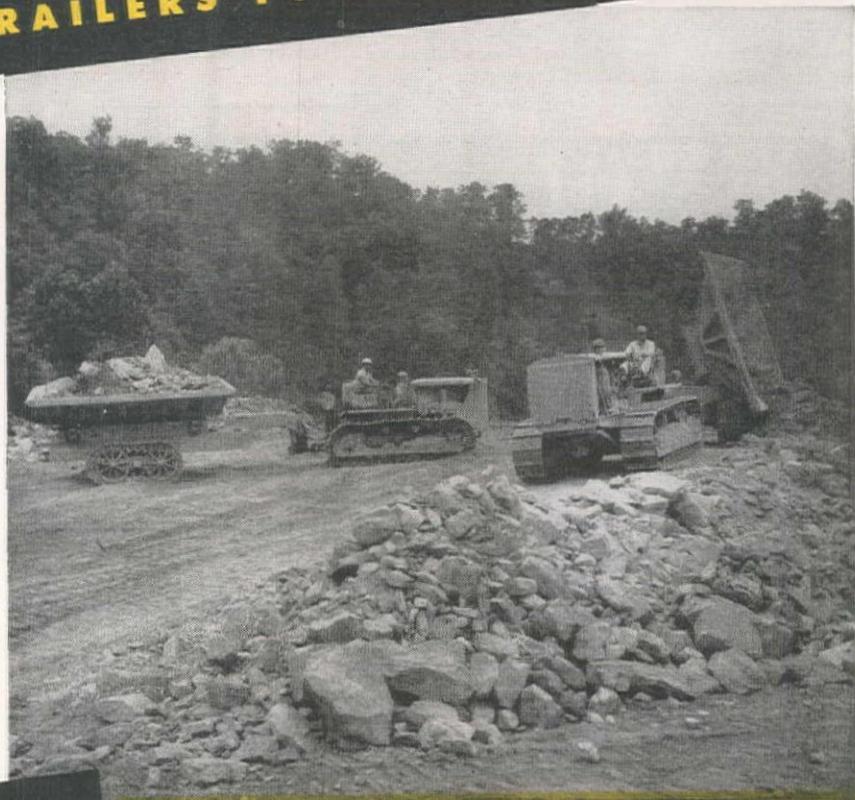


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CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than \$75,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information:

County of job location (capital letters); name and address of contractor (bold face); bid price; brief description of work; awarding agency; and approximate date of award. More detailed information may be secured concerning employment conditions, wage rates, etc., by writing directly to the contractor. When available, the names of the supervisory personnel will be published in the "Supervising the Jobs" columns.

CONTRACTS AWARDED

Large Western Projects . . .

Peter Kiewit Sons' Co., Omaha, Nebraska, was awarded a \$9,984,000 contract by the District Corps of Engineers, Omaha, for the construction of the Veterans Administration Hospital, to be bounded by Woolworth Ave., the Omaha Belt Line Railroad, Center and 42nd Sts., Omaha. Work includes construction of a main hospital unit, seven auxiliary bldgs. to provide for nurses' quarters, two staff residences, manager's residence, attendants' quarters, garage and laundry bldg., and boiler house. The main unit will be constructed of steel frame with concrete and tile or masonry block fireproofing.

Merritt-Chapman & Scott Corp., New York City, N. Y., will build a \$17,000,000 pulp and paper mill near Sacramento, Calif., for the Newsom Kraft Corp. of San Francisco, Calif. The main group of buildings will be of reinforced concrete, 0.5 mi. long and from one-story to 120 ft. in height. They will comprise an entirely integrated mill, with a capacity of 500 tons of kraft board and 200,000 ft. of wallboard a day. The mill is to be located on a 560-acre tract six miles northwest of Sacramento on the Sacramento River. Construction should be completed in about a year and a half.

Guy F. Atkinson Co., San Francisco, Calif., Bressi & Bevanda Constructors, Inc., Los Angeles, Calif., Charles L. Harney, Inc., San Francisco, W. E. Kier Construction Co., Los Angeles, A.

Teichert & Son, Inc., Sacramento, Calif., Trepte Construction Co., San Diego, Calif., and Gordon Construction Co., Denver, Colo., were awarded the \$19,432,386 contract by the District Corps of Engineers at Kansas City, Mo., for the construction of the Harlan County Dam in Nebraska. The dam will be located on the Republican River about 8 miles east of Alma. Work includes clearing of the site, excavation, embankment, slope protection and drainage, reinf. conc., spillway bridge and approaches, sluice gate hydraulic system, tainter gates and operating system, installing Govt. furnished sluice gates, parking areas, roads and miscellaneous items. Mark C. Walker & Son of Santa Ana, Calif., was awarded the \$1,052,510 contract for the initial embankment construction on the dam in the early part of July, 1946.

San Francisco Bridge Co., San Francisco, Calif., and Standard Dredging Corp., Los Angeles, Calif., were awarded the \$2,198,950 contract by the Corps of Engineers, Portland, for the removal of rock and overburden to a depth of 30 ft. below mean lower low water in the channel from Guano Rock near Mile 1 to a point below Empire near Mile 4.5. All excavated materials are to be disposed of by the contractors. The work is located in Coos Bay, Oregon.

Manson Construction & Engineering Co., and Osberg Construction Co., joint venturers, of Seattle, Wash., were awarded the \$1,719,335 contract for the construction of the Northern Pacific Railway transfer bridge and levee along the Puyallup River, Tacoma, Wash. The work involves construction of approximately 4.4 mi. of levee and rectification of 2.2 mi. of channel. Specifications include the removal of 280 ft. of timber railroad trestle and a 240-ft. steel swing span on timber piers and replacement at a new location with two 129-ft. steel trusses and two 660-ft. through plate girders on timber piers and concrete

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Rocker attachment on the GAR-BRO Type R Rocker Dump-Cart eliminates roll-back of the cart when dumping. Especially efficient for handling dry or stiff concrete. Other cart features: (1) body has no inside welds; (2) supporting member of axle is a steel channel bent around bottom and bolted to tray; (3) tray is flanged for stiffness; (4) wheels are steel spoked with depressed hubs to permit passing on runways; (5) wheel bearings are 4 inch length roller bearings; (6) 4.00 x 18, 4-ply pneumatic tires; (7) pulling bail welded to tray bottom. Write GAR-BRO Manufacturing Co., 2416 E. 16th St., Los Angeles 21, Calif.

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Engineering research has improved SCOOPMOBILE performance. Incorporation of the new Reversing, Reduction Gear Box into SCOOPMOBILE'S rugged power train provides additional gear reductions of 3.01 to 1 forward, and 2.5 to 1 reverse.

The Gear Box unit, using a steel fabricated case with case hardened, precision gears is constructed to stand up under continuous heavy-duty operation. Weight of the unit is 150 lbs.

Two factors provide increased flexibility:

1. Speeds can be reduced to less than 1 MPH. for loading purposes.
2. Four speeds of motor transmission are available in both forward and reverse.

Speeds are pre-selected and quickly changed for loading or high speed operation. A neutral position is provided to disengage the Gear Box as well as the transmission when the machine is being moved between jobs. Because a SCOOPMOBILE'S load is carried in a scoop situated directly over the drive wheels, a downward pressure insures positive traction under the most adverse conditions.

Gear Box is standard equipment for all SCOOPMOBILES on order as of December 15, 1947. The unit is available for installation on existing Model B machines.

See or write your nearest SCOOPMOBILE Dealer

Neil B. McGinnis Co., P. O. Box 3615, Phoenix, Ariz.; Capitol Tractor & Equipment Co., P. O. Box 928, Sacramento 4, Calif.; Hudson-Tucker, Inc., 629 First Ave., San Diego 12, Calif.; Rhodes & Jamieson, Ltd., 333 - 23rd Ave., Oakland 4, Calif.; Constructors Equipment Co., 3707 Downing St., Denver, Colo.; Engineering

Sales Service, 121 N. 12th St., Boise, Idaho; Robinson Motors, 323 McKinley Ave., Kellogg, Idaho; Hall-Perry Machinery Co., Box 1367, Butte, Montana; Mack Truck Sales, Box 1813, Reno, Nevada; Lively Equipment Co., 2601 N. Fourth St., Albuquerque, N. M.; Comely Motors, 511 S.E. Court St., Pendleton, Ore.; Paul H.



BETTER, EASIER LOADING

The slow forward speed — less than 100 feet per minute ... permits synchronizing rate of forward travel with the closing action of the bucket. Aids getting a full load.

4 OPERATING SPEEDS

— Both Directions

Desired speed can be pre-selected in the motor transmission, and direction of travel is then obtained by simply moving the gear box shifting lever forward or backward.

OPERATORS TRAINED

— Quicker

Inexperienced operators can handle capacity loads after the first few trial runs. Operators can select the speed at which they are most capable of handling the machine.

MIXERMOBILE DISTRIBUTORS, INC.

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CHICAGO	1224 First National Bank Building		

abutments with timber pile foundation. The District Corps of Engineers at Seattle made the award.

The Bonforte Construction Co., Colorado Springs, Colo., will build a \$3,000,000 subdivision to include 320 two- and three-bedroom, frame and stucco dwellings, a shopping center and school on a 92-acre subdivision extending to the Rock Island railroad main line on the north and to Templeton Gap Rd. on the east in Colorado Springs.

Griffith Co., Los Angeles, Calif., was awarded the \$1,037,126 contract by the Division of Highways at Sacramento, Calif., for two miles of hwy. to be paved with Portland cement concrete and asphaltic concrete and a pedestrian underpass to be constructed on Santa Ana Parkway, between Soto St. and Eastman Ave., Los Angeles, Calif.

Cahill Bros., San Francisco, Calif., will build two factory buildings in San Francisco for Best Foods, Inc. The first building will be of reinforced concrete, three-stories and basement at Mariposa and Bryant Sts. The second will be located at 18th and Florida Sts., and is to be of reinforced concrete with a structural steel frame, four-stories and basement. The contract price is \$1,250,000.

Morrison-Knudsen Co., Inc., Seattle, Wash., has been awarded a \$1,000,000 contract by the Great Northern Railway Co. of St. Paul, Minn. The project calls for line relocation in the Cascade Mts., 46 mi. west of Wenatchee, Wash. 4,331 ft. of new trackage, including a 700-ft. tunnel and a 650-ft. bridge across Nason Creek are to be constructed. The new track is to have a single curve of four degrees as compared to the existing six with 220 degrees of curvature. The work will probably take two years.

Winston Bros. Co., Azusa, Calif., will grade and surface with plant mix surfacing on approximately 4.4 miles of highway between Violin Saddle and Whitaker Summit in Los Angeles County, Calif. The \$1,373,504 contract was awarded by the Division of Highways at Sacramento, Calif.

The Macco Corp. of Clearwater, Calif., was awarded a \$1,117,900 contract by the Corps of Engineers, Los Angeles, Calif., for the construction of downcoast and middle jetties for the San Diego River and Mission Bay Project, San Diego, Calif. Approximately 5,120 lin. ft. of stone jetty is to be constructed at the ocean entrance to Mission Bay. Time allowed for completion is 540 days.

Parish Bros. of Benicia, Calif., submitted the low bid of \$1,210,080 before the State Division of Highways at Sacramento, for highway construction in Solano County, Calif., between Vallejo Wye and 0.5 mi. north of Route 208, about 5.6 miles to be graded and paved with Portland cement concrete on untreated rock base and with plant mix surfacing on P.C.C. base and on existing pavement and a reinforced concrete grade separation structure to be constructed.

The Downer Corp. of Stockton, Calif., was awarded a contract by the County Commission, Bakersfield, Kern County, Calif., in the sum of \$763,966 for the construction of a sewage treatment plant to be located approximately 3 mi. east of Bakersfield, for the Mt. Vernon County Sanitation District.

A. Teichert & Son, Inc., Sacramento, Calif., submitted the low bid of \$984,640 to the District Corps of Engineers in Los Angeles, Calif., for the construction of 14,070 lin. ft. of levee, channel clearing and track work in Ventura River Channel, between the Pacific Ocean and Canada De San Joaquin, Ventura County, Calif.

Haddock Engineers, Ltd., Montebello, Calif., with the bid of \$1,545,997 was awarded the contract by the Corps of Engineers, Albuquerque, New Mexico, for the construction of 152 frame and stucco dwellings; building roads; and installing water, sewer, gas and lighting systems at the Sandia Base, Albuquerque.

J. E. Haddock, Ltd., Pasadena, Calif., with the bid of \$884,692 was awarded the contract by the Division of Highways at Sacramento, Calif., for 2.3 miles of highway to be graded and paved with Portland cement concrete and asphalt concrete on Olympic Blvd., between Lincoln Blvd. and Bundy Drive in Los Angeles Co., Calif.

Rand Construction Co. of Bakersfield, Calif., will erect the \$337,020 Isabella auxiliary dam across the Kern River, near Bakersfield, Calif., for the District Corps of Engineers at Sacramento. The entire project includes the above mentioned auxiliary dam, a short diversion tunnel and the large concrete dam which will be located on the main fork of the Kern River. Relocation of the towns of Isabella and Kernville, Kern County, will be necessary as they are now within the proposed reservoir area. The estimated cost of the entire project is over \$12,000,000 and will probably take four or five years to complete. H. J. Dickinson is Resident Engineer.



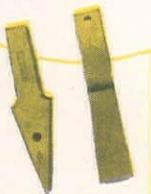
All Purpose SHOVEL PULLSHOVEL • DRAGLINE CLAMSHELL

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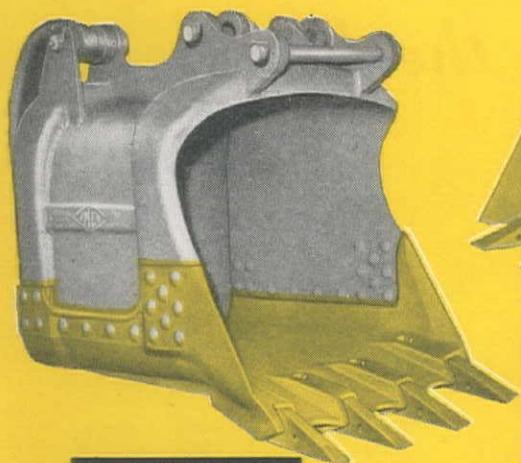
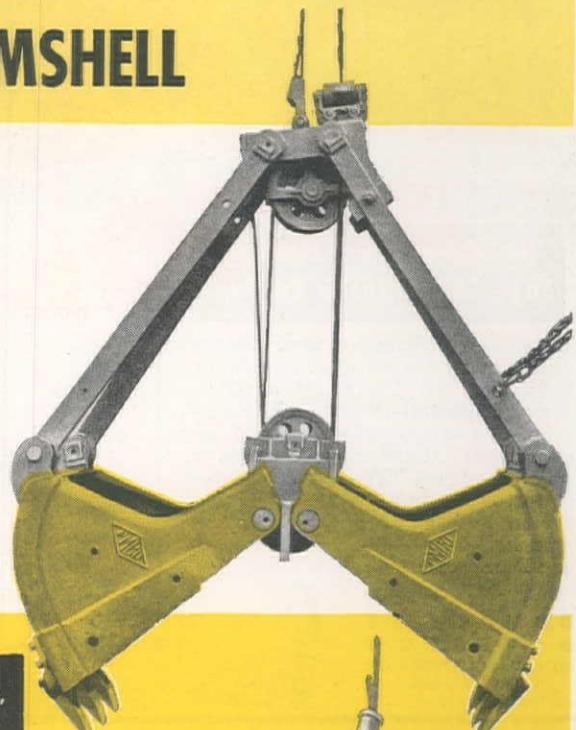
FRONTS, BOTTOMS, SCOOPS and TEETH shown in yellow on buckets are 14% manganese steel developing tensile strength up to 120,000 p.s.i. This high percentage manganese steel gives tough, rugged strength for hard service and allows wide set corner teeth for easy entrance in digging. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

Experience Counts. See your shovel man or equipment dealer about PMCO Buckets and Dippers.

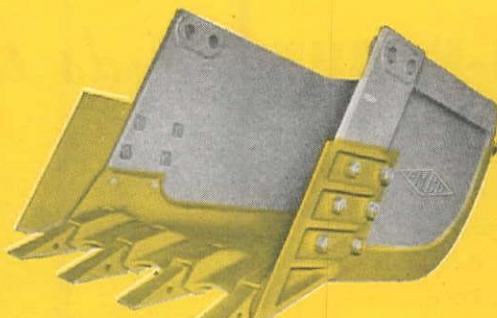
On the $\frac{1}{2}$ yd. and
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all teeth are
interchangeable—
a great advantage to
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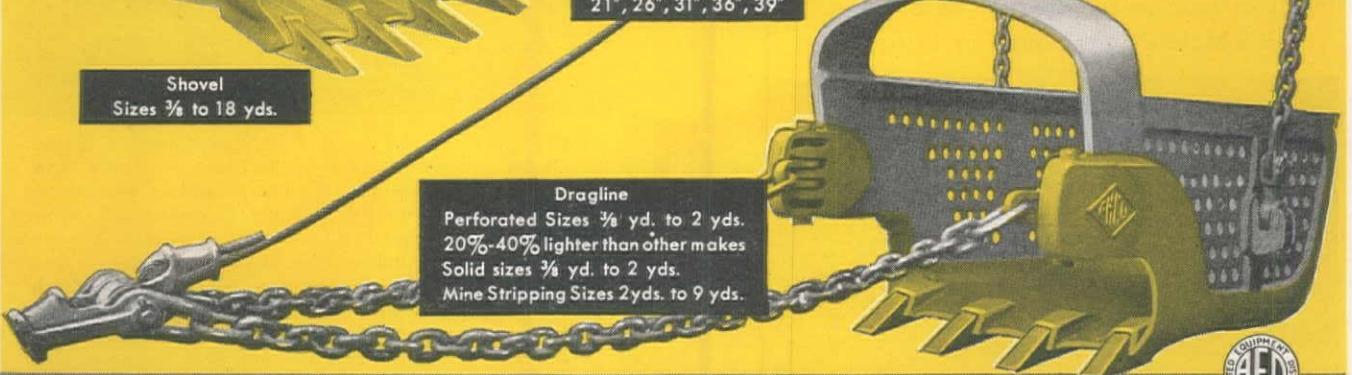
Clamshell
Sizes $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$,
1 yd.



Shovel
Sizes $\frac{3}{8}$ to 18 yds.



Pullshovel
Outside Cutter Widths:
21", 26", 31", 36", 39"



Dragline
Perforated Sizes $\frac{3}{8}$ yd. to 2 yds.
20%–40% lighter than other makes
Solid sizes $\frac{3}{8}$ yd. to 2 yds.
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Christiansen Brothers used Dumpercones on several scattered foundation pours for the University of Utah. Through central-mixing and Dumpercones-delivery, they found "much less confusion." Hauls ranged up to a mile. They say, "We found no segregation or bleeding and the units functioned in a thoroughly satisfactory manner." You'll want to learn about the Dumpercones too. Write today.

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Arizona

GRAHAM CO.—R. H. Martin Contracting Co., Box 934, Tucson—\$256,784 grade, base and surf. of hwy. approx. 1 1/4 mi. in length through Pima, and 1 mi. grade and surf. through Solomonsville—by State Highway Department, Phoenix. 2-6

GRAHAM CO.—Wallace & Wallace, Box 470, Phoenix—\$260,231 for Geronimo-Solomonsville Hwy. grade, drain, base and surf. through towns of Thatcher and Safford—by State Highway Department, Phoenix. 2-6

MARICOPA CO.—C. B. Cansler, Box 1828, Yuma—\$344,717 for approx. 3 mi. grade and drain over new alignment, Rock Springs-Prescott Hwy., 48 mi. north of Phoenix—by State Highway Department, Phoenix. 2-6

PINAL CO.—Vinnell Company, Inc., 1145 Westminster Ave., Alhambra, Calif.—\$339,301 for approx. 1 mi. grade and drain of new alignment betw. Superior and Superior-Miami tunnel—by State Highway Department, Phoenix. 2-18

California

FRESNO CO.—Morrison-Knudsen Co., Inc., Title Guaranteed Bldg., Los Angeles—\$767,745 for relocation of Hughes Creek Rd., from Sunnyside Summit to Trimmer—by Division of Highways, Sacramento. 2-6

LOS ANGELES CO.—Griffith Co., 1060 So. Broadway, Los Angeles—\$1,037,126 for 2 mi. grade and pave on Santa Ana Parkway, betw. Soto St. and Eastman Ave., Los Angeles—by Division of Highways, Sacramento. 2-17

LOS ANGELES CO.—J. E. Haddock, Ltd., 3538 E. Foothill Blvd., Los Angeles—\$884,692 for 2.3 mi. grade and pave on Olympic Blvd., betw. Lincoln Blvd. and Bundy Dr.—by Division of Highways, Sacramento. 2-6

LOS ANGELES CO.—Winston Bros. Co., 401 No. Irwindale Ave., Azusa—\$1,373,504 for 4.4 mi. grade and surf. betw. Violin Saddle and Whitaker Summit—by Division of Highways, Sacramento. 2-13

PLACER CO.—Clyde W. Wood, Box 620, Hollywood—\$448,361

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More and more, progressive West Coast Operators are turning to Smith-Mobile for their truck mixer requirements. Improved Smith-Mobile models are available in four popular sizes. Naturally, at this time, the demand exceeds the supply. But deliveries are being stepped up by greatly increased production. Before you buy new Truck Mixer equipment, be sure to investigate Smith-Mobile's profit-making features.



No. 2 Smith-Mobile with separate engine drive, mounted on Chevrolet Truck.



Check these plus values: — Dual Water Injection System — No Water Bell or Nozzle Inside Drum — Gravity Flow Feed Chute Charging — No Leaky Loading Hatches — Real Visible Mixing — Larger Drum, Increased Capacity — Lower Weight, Bigger Pay Loads — High Discharge Directly into Forms — Controlled Slow or Fast Discharge — Perfected Drum Closing Door and Seal — Famous Smith "End-to-End" Mixing Action — Direct Connected Motor with 3-Point Suspension — Improved Transmission Cushioned in Rubber — Beauty Combined with Performance.

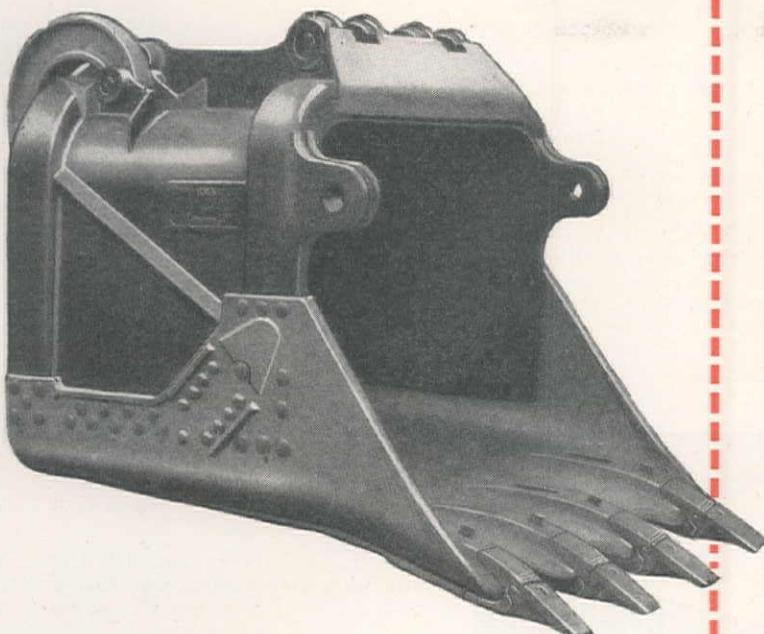
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TRUCK MIXER & AGITATOR*

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WESTERN CONSTRUCTION NEWS—March, 1948



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LIGHT WEIGHT COAL LOADING DIPPER

All fabricated bucket for loading shot coal.
1 to 8 yards.

CAST-WELDED DIPPER

For general purpose work. $\frac{3}{8}$ to $6\frac{1}{2}$ yards.

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For extremely severe service. $\frac{3}{8}$ to 5 yards.

MEDIUM WEIGHT DRAGLINE

Used where extra weight and strength are not required. $\frac{3}{8}$ to 20 yards.

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Especially designed for coal or phosphate stripping. 1 to 18 yards.

STANDARD TYPE DRAGLINE

For tough digging jobs. $\frac{1}{2}$ to 18 yards.

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For the very hardest digging. $\frac{3}{4}$ to 10 yards.



WRITE FOR LITERATURE. Illustrated catalogs giving complete specifications and construction details of these strongest-per-pound buckets will be sent you upon request. See your nearest ESCO representative or fill in and mail the coupon below.

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Please send us information on Cast-Welded Dippers.
 All-Cast Dippers. Coal Loading Dippers. Medium Weight Dragline. Standard Type Dragline. Heavy Duty Type Dragline. Stripping Dragline Buckets

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City _____ State _____

for 5.6 mi. grade and surf., Mosquito Ridge, Tahoe National Forest—by Public Roads Administration, San Francisco. 2-24

SOLANO CO.—Parish Bros., Box 6, Benicia—\$1,210,080 for 5.6 mi. grade and pave, betw. Vallejo Wye and 0.5 mi. north of Rt. 208—by Division of Highways, Sacramento. 2-19

Colorado

ADAMS CO.—J. H. & N. M. Monaghan & Associates, Rt. 1, Derby—\$407,851 for 4.1 mi. gravel surf. of State Hwy. No. 3, betw. Adams City and Greeley—by State Highway Department, Denver. 2-19

GUNNISON CO.—Schmidt Construction Co., Box 66, Grand Junction—\$275,318 for 4.1 mi. gravel surf. of State Hwy. No. 6, betw. Sapinero and Gunnison—by State Highway Department, Denver. 2-19

Idaho

BOUNDARY CO.—F. R. Hewett & Co., Box 46, Parkwater, Wash.—\$81,609 for 5.5 mi. resurface of rd. from U. S. Hwy. No. 95 to Moyie Springs—by Bureau of Highways, Boise. 2-20

FREMONT & TETON COS.—Barnhart & Wheeler, 326 Monroe Ave., Pocatello—\$221,155 for 4.1 mi. of roadbed, drain structs., gravel surf. and 220-ft. steel and conc. bridge on Ashton-Drummond-Tetonia Rd., betw. Lamont and Felt—by Bureau of Highways, Boise. 2-9

LEMHI CO.—Barnhart & Wheeler, 326 Monroe Ave., Pocatello—\$52,644 for 4.8 mi. grade, drain structs. and gravel surf. of Pahsimeroi Road, from U. S. Highway No. 93 south—by Bureau of Highways, Boise. 2-9

Montana

BEAVERHEAD CO.—Chas. Shannon Co., 502 So. Washington St., Butte—\$246,368 for 10.4 mi. grade, drain and surf. of Ralston-Divide Section of Wisdom-Divide Rd.—by State Highway Commission, Helena. 2-6

CASCADE CO.—Union Construction Co., Box 1845, Great Falls—\$176,304 for 4.9 mi. grade, and subgrade stabilization of section of Lewis and Clark Hwy. along Lolo Creek from Woodman west to Graves Creek—by State Highway Commission, Helena. 2-1

GALLATIN CO.—Nilson-Smith Construction Co., Box 1147, Great Falls—\$189,675 for 10.3 mi. grade, drain and surf. and constr. of treated timber pile bridge on Bridger Canyon Rd.—by State Highway Commission, Helena. 2-6

Nevada

CLARK CO.—Olof Nelson Construction Co., Box 413, Logan, Utah—\$233,205 for hwy. constr. in Las Vegas, Main St. and Bonanza Rd.—by Department of Highways, Carson City. 2-6

DOUGLAS AND ORMSBY COS.—Silver State Construction Co., Inc., Fallon—\$324,192 for 7.6 mi. grade, drain and surf. of Rt. No. 3, from a point 6.5 mi. north of Minden to Carson City—by Department of Highways, Carson City. 2-19

WASHOE CO.—Silver State Construction Co., Inc., Fallon—\$121,229 for 10.1 mi. base and surf. of Rt. No. 34-A, from north boundary Pyramid Lake Indian Reservation north—by Department of Highways, Carson City. 2-19

New Mexico

CHAVES CO.—D. D. Skousen, Springer Bldg., Albuquerque—\$469,587 for 13.1 mi. grade, drain, bitum. surf., seal coat and constr. two conc. box culverts, U. S. Hwy. No. 70, betw. Acme and Roswell—by State Highway Department, Santa Fe. 2-17

TAOS CO.—R. P. Skousen, Springer Bldg., Albuquerque—\$210,952 for 10.4 mi. grade, minor drain structs., asph. stabilized base of U. S. Hwy. No. 285, betw. Ojo Caliente and Taos Junction—by State Highway Department, Santa Fe. 2-17

North Dakota

MERCER AND OLIVER COS.—Wm. Collins & Sons, Inc., Black Bldg., Fargo—\$283,705 for 18.6 mi. grade and surface on State Hwy. No. 25, from Hanover to north and east of Hazen—by State Highway Department, Bismarck. 2-1

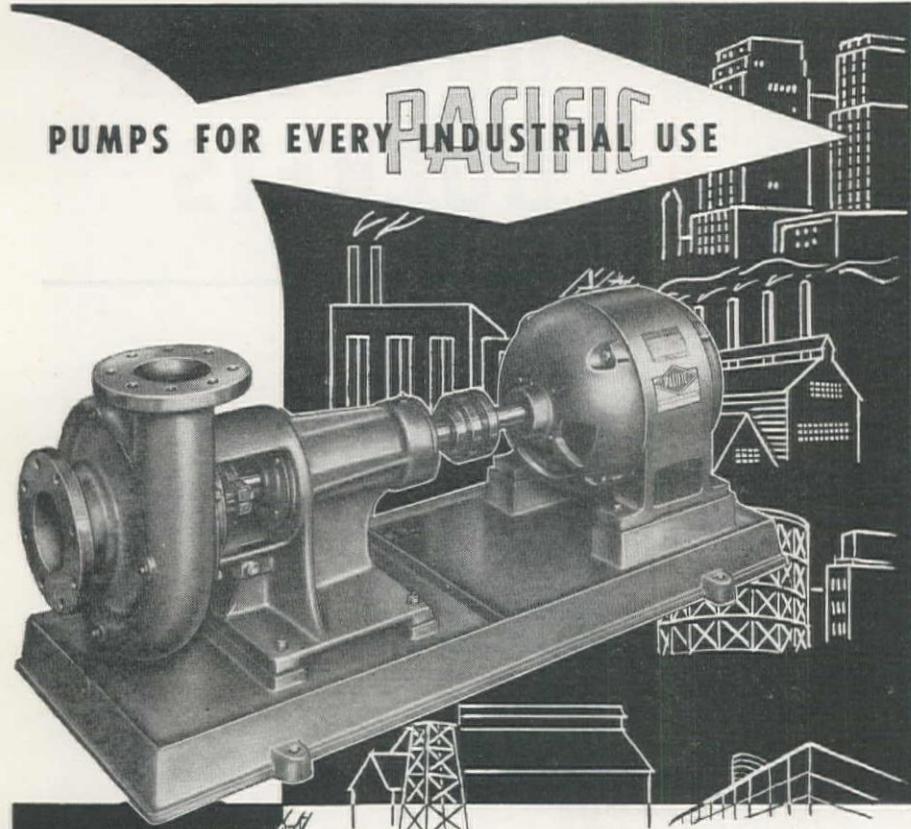
Oregon

DOUGLAS & JOSEPHINE COS.—Babler Bros., 4617 S.E. Milwaukee Ave., Portland—\$292,796 for 14.2 mi. bitum. surf. and furn. crushed rock in stockpiles, Johns-Mackin Gulch Section of Pacific Hwy.—by State Highway Commission, Salem. 2-12

JOSEPHINE CO.—M. L. O'Neil & Son, Eugene—\$132,128 for 4.5 mi. grade, surf. and oil of Gunnell Rd.—Robertson Bridge Section of Rogue River Loop Secondary Hwy.—by State Highway Commission, Salem. 2-4

MULTNOMAH AND WASHINGTON COS.—Parker Schram Co., Builders Exchange Bldg., Portland—\$239,213 for 0.8 mi. grade and 3.7 mi. pave of Barbur Blvd. Boones Ferry Rd. Section of West Portland-Hubbard Hwy.—by State Highway Commission, Salem. 2-12

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Throughout the West, Pacific Pumping Company is recognized for the fact that they provide pumps for every pumping requirement. Regardless of the specific type of pump you need—turbine, boiler feed, condensation, self-priming or centrifugal, you will find that Pacific can meet your specifications. Contractor's rental service for jobs of short or extended duration are also a part of Pacific's plan to provide pumps for every service. Over forty years experience in pump manufacturing have given us the knowledge to engineer pumps that will handle capacity loads at a minimum cost. Western factories located in Oakland and Portland assure quick delivery of your orders and prompt service in assisting you on any of your pumping problems.

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14-Story Structure Erected Speedily, Quietly by Arc Welding

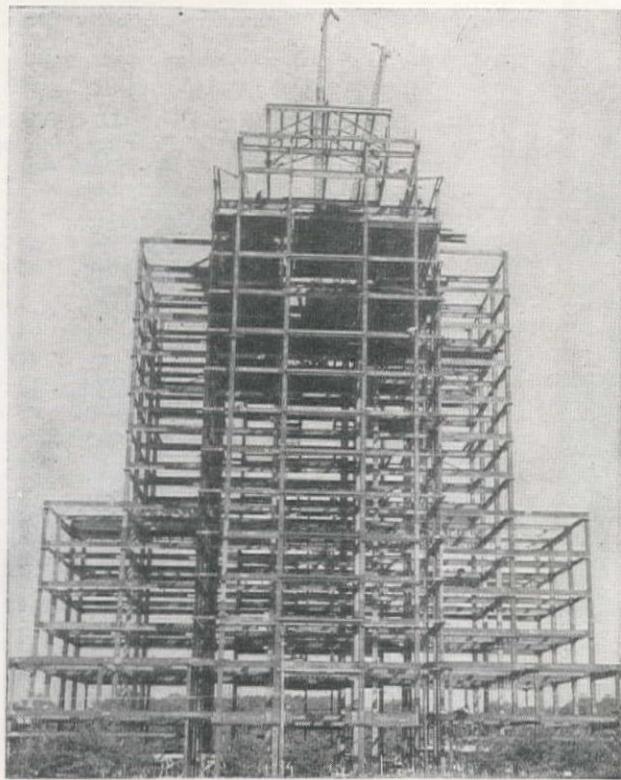


Fig. 1. All-welded structure of Hermann Professional Building.

By John R. Long, Mgr.

Houston Sales Office, Consolidated Steel Corp. of Texas
Orange, Texas

ONE of the tallest structures ever erected by arc welding is the Hermann Professional Building, a unit of the new Texas Medical Center under construction in Houston, Texas. The building is 14 stories with an additional first and second penthouse and hipped roof.

The 1400-ton structure (Fig. 1) was completely erected in 60 working days which is considered excellent speed for a building of this size and type. Considerable saving in steel tonnage was realized due to the structure's welded design. Eleven welders used approximately 40,000 pounds of Lincoln "Fleetweld 5" electrode for shop and field welding.

This is one of the first buildings of its type erected in the South, and exemplifies the rigidity and solidness of arc welded structures. There are 57 columns which, when set, were found to join perfectly.

Fig. 2 shows a connection from the spandrel beam to the corner column. Due to the flange connection, stiff-

ener plates were required in the web and since the spandrel beam was centered on the flange of the column, the stiffener plate acts as a connection plate for the spandrel. Their entrant cut was necessary due to pipe chases in the floor.

As shown in Fig. 3, the column at the corner of the elevator opening is the only portion of the structure where cross-bracing was employed. It shows a typical connection of one of the many beams throughout the job that were offset from the center line of the columns. Due to the various types of conditions, a design was made of each connection and drawn in detail before any structural detailing was started. This enabled us to design nearly all connections for downhand welding. A welding sequence was employed throughout erection which proved economical in the fact that none of the structure had to be replumbed after welding had been completed. Engineers checked each column with a transit, and the column corners showed no more than a $\frac{1}{8}$ " variance from top to bottom.

The architect firms which had joint responsibility for this job and the erection sequence are Hedrick & Lindsley and Kenneth Franzheim, both of Houston. The general contractor is Linbeck & Dederick Construction Co., Houston, and the Consolidated Steel Corporation of Texas is the fabricator and erector.

Conspicuous by its absence on this job was the noise usually associated with structural work. Silent erection, one of the advantages of arc welded structures, is particularly important in areas where quiet must be maintained.

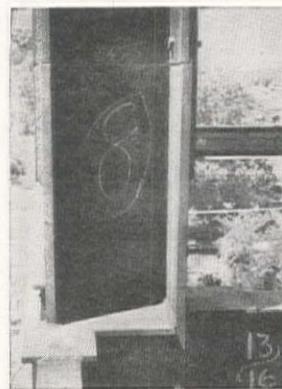
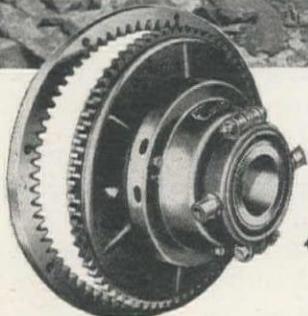
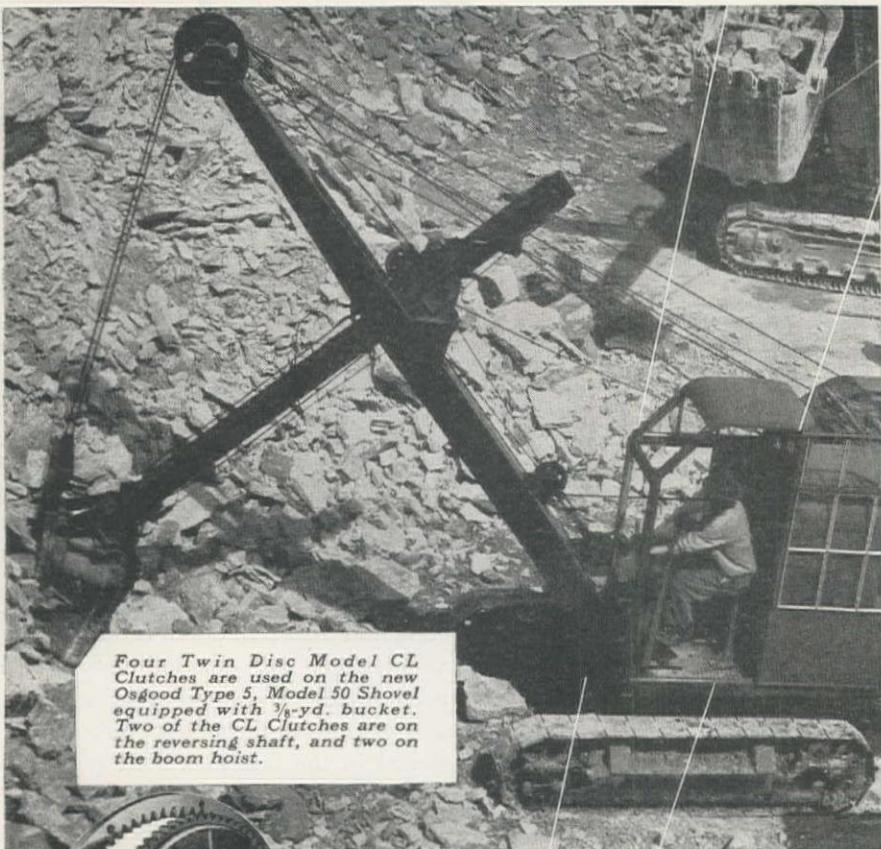


Fig. 2. Welded connections are simple in design. Bolts serve only to hold plates in position for welding.



Fig. 3. Corner of elevator opening showing only place where cross-bracing is employed.

The above is published by LINCOLN ELECTRIC in the interests of progress.
Structural Design Studies are available free to architects and engineers. Write The Lincoln Electric Company, Dept. 142, Cleveland 1, Ohio.



Twin Disc Model CL Clutch

Maximum performance ... minimum space

Some construction jobs call for small yet rugged equipment . . . equipment built to work fast and hard in cramped space.

Answering this need, construction equipment manufacturers have produced tough, little shovels, designed and engineered to meet the job requirements. Into these machines, manufacturers have put Twin Disc Model CL Clutches, because this friction clutch is built to give maximum performance in minimum space.

For requirements limited by space, Twin Disc Model CL Clutches are built with one, two and three friction plates . . . sizes

from 5.5" to 11.5" . . . and are designed to transmit loads of from 1.5 to 19.5 hp per 100 rpm. Maximum bore sizes are available to accommodate oversize shafts.

Providing single-point adjustment, plus extreme ease in engagement and disengagement, Model CL Clutches are supplied with gear tooth drive for easy assembly. Readily attachable driving rings are available for use with flywheels, drums and pulleys. For complete specifications, write for Bulletin No. 120-C. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).



Machine Tool Clutch



Marine Gear



SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

UNION CO.—E. C. Hall Co., Rt. 6, Box 630, Portland—\$321,822 for 6.2 mi. grade and oil mat surf. of Elgin-Boswell Ranch Section of Wallowa Lake Hwy.—by State Highway Commission, Salem. 2-12

Washington

CHELAN CO.—Goodfellow Bros., Inc., Wenatchee—\$69,373 for 1.6 mi. grade, drain and surf. of Stemilt Hill—by Department of Highways, Olympia. 2-10

KING CO.—Northwest Construction Co., 3950 6th Ave., N.W., Seattle—\$81,879 to pave Columbia Drive, Seattle—by City Board of Public Works, Seattle. 2-20

GRAYS HARBOR CO.—L. J. Birbeck, Box 124, Seattle—\$105,163 for 9.5 mi. light bitum. surf. of Ocean Beach Rd.—by Department of Highways, Olympia. 2-10

SNOHOMISH CO.—Associated Sand & Gravel Co., 2508 Colby, Everett—\$109,852 for 6.8 mi. clear, grub, reconstr. roadway ditches, surf., and asph. conc. pave of Primary State Hwy. No. 15, Index to Goldbar—by Department of Highways, Olympia. 2-10

WHITMAN CO.—Roy L. Bair & Co., 1220 W. Ide Ave., Spokane—\$438,685 for 13.7 mi. grade, drain and surf. of Primary State Hwy. No. 3, Colton to Pullman—by Department of Highways, Olympia. 2-6

YAKIMA CO.—Fiorito Bros., 1100 Leary Way, Seattle—\$121,055 for 0.9 mi. clear, grub, surf. and cement conc. pavement, Primary State Hwy. No. 3, from Yakima north—by Department of Highways, Olympia. 2-6

YAKIMA CO.—White Bros., Box 376, Walla Walla—\$231,836 for 0.9 mi. grade, drain and surf. of Primary State Hwy. No. 3 and county road, Selah Rd. connection—by Department of Highways, Olympia. 2-10

Wyoming

NATRONA CO.—Peter Kiewit Sons' Co., Omaha Natl. Bank Bldg., Omaha, Nebr.—\$255,306 for approx. 17 mi. of base course surf. of Midwest-Casper rd.—by State Highway Commission, Cheyenne. 2-20

SWEETWATER CO.—Northwest Engineering Co., Box 567, Denver, Colo.—\$68,287 for street surf. in Superior and south of Rock Springs—by State Highway Commission, Cheyenne. 2-20

Bridge & Grade . . .

California

SAN DIEGO CO.—Walter H. Barber, 7309 El Cajon Blvd., La Mesa—\$89,552 for reinf. conc. girder bridge and grade and surf. of approaches at San Felipe Creek, approx. 15 mi. east of Julian—by Division of Highways, Sacramento. 2-19

Montana

JEFFERSON CO.—Carson Construction Co., 720 Helena Ave., Helena—\$39,441 for steel and conc. bridge over Boulder River on Boulder-Cardwell Rd.—by State Highway Commission, Helena. 2-6

Oregon

LINN CO.—Warren Northwest, Inc., Box 5072, Portland—\$125,631 for 0.8 mi. grade and pave, and constr. of 74-ft. reinf. conc. bridge, Lebanon Section of Santiam Hwy.—by State Highway Commission, Salem. 2-12

MULTNOMAH CO.—Walder & Kenworthy, Portland—\$47,420 for Bristol undercrossing and Troutdale grade separation structs. on Columbia River Hwy.—by State Highway Commission, Salem. 2-2

Utah

WEBER CO.—Wheelwright Construction Co., 2300 E. Ave., Ogden—\$72,678 for conc. and steel bridge and road mixed bitum. surf. of approaches, Rt. No. 80, near Warren—by State Road Commission, Salt Lake City. 2-21

Washington

KING CO.—Alton V. Phillips, 1400 W. Nickerson St., Seattle—\$69,629 for steel walkways and ladders in conc. pontoons of Lake Washington floating bridge on Primary State Hwy. No. 2—by Department of Highways, Olympia. 2-10

PIERCE CO.—Manson Construction & Engineering Co., 821 Alaskan Way, Seattle, and Osberg Construction Co., 1132 No. 128th St., Seattle—\$1,719,335 for Northern Pacific Railway transfer bridge and levee, along Puyallup River, Tacoma—by Corps of Engineers, Seattle. 2-10

SNOHOMISH CO.—N. Fiorito Co., 844 W. 48th St., Seattle—\$455,526 for 4.9 mi. grade, drain, surf. and constr. of reinf. conc. flat slab bridges (4) of Primary State Hwy. No. 15, Snohomish to Monroe—by Department of Highways, Olympia. 2-6

Water Supply . . .

Arizona

YAVAPAI CO.—A. B. C. Construction Co., 810 No. Lakewood Blvd., Paramount, Calif.—\$133,802 for welded steel pipe lines for water supply to Prescott from wells in the Del Rio Artesian Basin, approx. 15 mi. north of Prescott—by City Council, Prescott. 2-6

YAVAPAI CO.—Fitzgerald Construction Co., 1212 W. Roosevelt, Phoenix—\$104,700 for 1,500,000 gal. capacity reservoir along Willow Creek Rd., approx. 2 mi. north of Prescott—by City Council, Prescott. 2-6

California

MARIN CO.—Western Pipe & Steel Co. of Calif., 141 Battery St., San Francisco—\$75,020 to furn. and erect a 3,000,000-gal. welded steel water storage tank, Mill Valley—by Marin Municipal Water District, San Rafael. 2-13

MONTEREY CO.—Ferguson Bros., 10524 Graffian St., Oakland—\$78,392 to install water lines and appurt., conc. storage tanks, intake struct., and pressure reducing valve boxes, Pfeiffer Big Sur State Park—by Division of Architecture, Sacramento. 2-10

Nevada

WASHOE CO.—I. Christensen Co., 234 Gardner St., Reno—\$71,005 to cover Cochran Ditch, from Mt. Rose St. to Stewart, Reno—by City Council, Reno. 2-3

Sewerage . . .

Arizona

MARICOPA CO.—J. H. Welsh, 613 So. Central, Phoenix—\$189,933 for replacement of sewers in Phoenix—by City Council, Phoenix. 2-6

California

ALAMEDA CO.—Elmer J. Freethy, 1432 Kearney St., El Cerrito—\$213,752 for intercepting sewer 7,000 ft. long, 42, 48 and 54-in. conc. pipe to be used, from intersection of Cleveland Ave. and Buchanan St., Albany to intersection of Second St. and Hearst Ave., Berkeley—by East Bay Municipal Utility District, Oakland. 2-17

ALAMEDA CO.—McGuire & Hester, 796 66th Ave., Oakland—\$63,969 for installation of sewers in Virginia St., Berkeley—by City Council, Berkeley. 2-5

CONTRA COSTA CO.—Stanley H. Koller, 1694 Pomona St., Crockett—\$195,455 for Central Trunk Sewer Section No. 4, approx. 1.7 mi., including four tunnels, east slope of Charles Hill to Orinda Country

Club—by Central Contra Costa Sanitary District, Walnut Creek. 2-24

FRESNO CO.—Franceschi Construction Co., Box 528, Fresno—\$91,870 for sewage disposal plant, Kingsburg—by City Council, Kingsburg. 2-18

KERN CO.—Downer Corp., 305 E. Weber Ave., Stockton—\$763,966 for sewage treatment plant, sewer farm and sewer system, Mt. Vernon County Sanitation District, approx. 3 mi. east of Bakersfield—by County Commission, Bakersfield. 2-20

LOS ANGELES CO.—Hoagland-Findlay Engineering Co., 3254 Cherry Ave., Long Beach—\$283,189 to repair central outfall sewer betw. approx. 600 ft. easterly of Gay St., and Eucalyptus Ave., Inglewood—by City Board of Public Works, Los Angeles. 2-6

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LOS ANGELES CO.—Leo T. Vuksic & Joe Vukoja, 3968 Boyce Ave., Los Angeles—\$394,560 for sanitary sewers in Riverside Dr. and Laurel Canyon Blvd. Sewer District, No. Hollywood—by City Board of Public Works, Los Angeles. 2-6

SAN DIEGO CO.—Walter H. Barber, 7309 El Cajon Blvd., La Mesa, and H. R. Breedon, 611 No. Willow St., Compton—\$98,362 to alter existing sewage treatment plant to standard filter process plant from an activated sludge process, Escondido—by City Council, Escondido. 2-10

Nevada

WASHOE CO.—Geo. E. Miller Construction Co., 111 Morrill Ave., Reno—\$60,549 to install 10,500 ft. of sewer outfall line in Reno—by City Council, Reno. 2-24

Washington

YAKIMA CO.—State Construction Co., Seattle—\$77,692 to install two large storm sewers, one in parts of Garfield, N. 16th and North Aves., the other along So. 16th Ave., Yakima—by City Council, Yakima. 2-1

Waterway . . .

California

SACRAMENTO CO.—H. Earl Parker, Inc., 12th & F Sts., Sacramento—\$262,134 for 4.8 mi. levee enlargement of east levee Feather River, from Simmer Slough upstream, Sacramento—by Corps of Engineers, Sacramento. 2-11

SAN DIEGO CO.—Macco Corp., 815 N. Paramount Blvd., Clearwater—\$1,117,900

for downcoast and middle jetties for San Diego River and Mission Bay project—by Corps of Engineers, Los Angeles. 2-20

VENTURA CO.—A. Teichert & Son, Inc., 1846 37th St., Sacramento—\$984,640 for 14,070 lin. ft. of levee, clearing channel and track work, Ventura River Channel, betw. the Pacific Ocean and Canada De-San Joaquin, Ventura—by Corps of Engineers, Los Angeles. 2-10

Oregon

COOS CO.—San Francisco Bridge Co., 503 Market St., San Francisco, Calif., and Standard Dredging Corp., 108 W. 6th St., Los Angeles, Calif.—\$2,198,950 for removal of rock and overburden, channel from Guano Rock to a point below Empire, Coos Bay—by Corps of Engineers, Portland. 2-13

Dam . . .

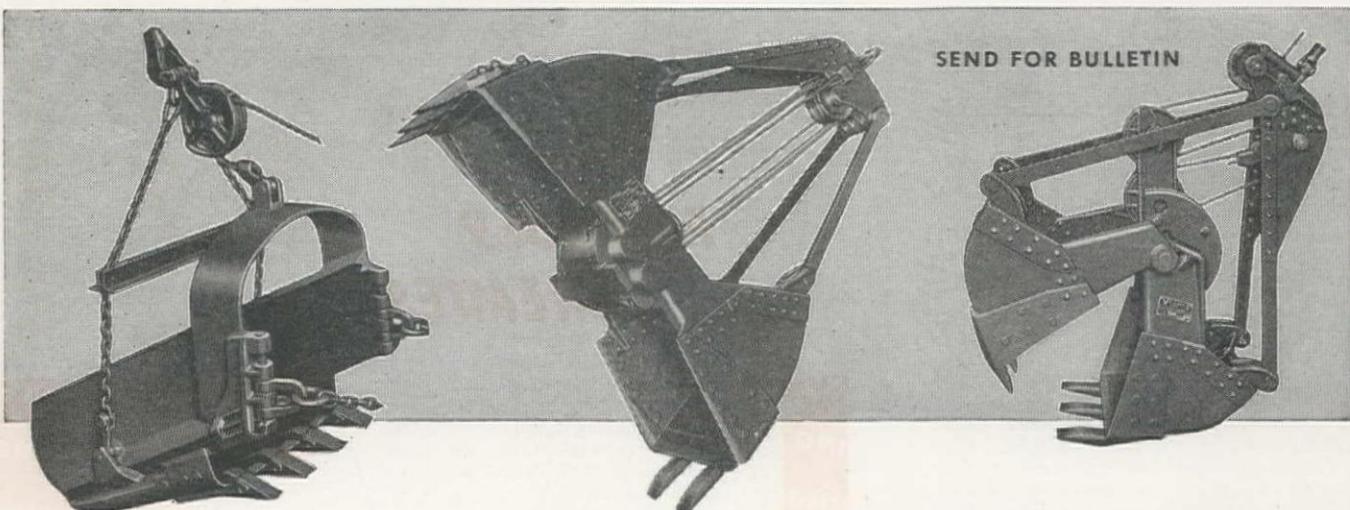
California

KERN CO.—Rand Construction Co., Box 1339, Bakersfield—\$337,020 for Isabella auxiliary dam on Kern River, near Bakersfield—by Corps of Engineers, Sacramento. 2-20

MERCED CO.—A. Teichert & Son, Inc., 1846 37th St., Sacramento—\$403,000 for dam and spillway on Mariposa Creek near Merced—by Corps of Engineers, Sacramento. 2-11

Nebraska

HARLAN CO.—Guy F. Atkinson Co., 10 W. Orange Ave., So. San Francisco, Calif.,



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Construction Equipment Corporation, Spokane, Wash.
Pacific Hoist & Derrick Company, Seattle, Wash.

Bressi & Bevanda Constructors, Inc., 417 So. Hill St., Los Angeles, Calif. Charles L. Harney, Inc., 575 Berry St., San Francisco, W. E. Kier Construction Co., 1462 No. Stanley Ave., Los Angeles, A. Teichert & Son, Inc., 1846 37th St., Sacramento, Calif. Trepte Construction Co., 2001 Kettner Blvd., San Diego, Calif., and David G. Gordon Construction Co., 1900 31st St., Denver, Colo.—\$19,432,386 for constr. of Harlan County Dam, on Republic River, approx. 8 mi. east of Alma—by Corps of Engineers, Kansas City, Mo. 2-9

Irrigation . . .

Oregon

MALHEUR CO.—Geo. B. Henly Construction Co., Caldwell, Idaho—\$155,647 for earthwork and structures, Locket Gulch Wasteway, Mitchell Butte Division, Owyhee Project, work located near Nyssa—by Bureau of Reclamation, Boise. 2-21

Power . . .

Nebraska

PERKINS CO.—Cater Electrical Construction Co., 1016 Baltimore Ave., Kansas City, Mo.—\$125,531 for 136 mi. of line to serve 137 members—by Midwest Electric Membership Assoc., Inc., Grant. 2-2

New Mexico

MCKINLEY CO.—Stearns-Roger Manufacturing Co., 1720 California, Denver—\$426,995 for steam generator and appurtenances at existing power generation station, Gallup—by City Council, Gallup. 2-6

North Dakota

SLOPE CO.—S. H. Reither, Aitkin, Minn.—\$97,145 for labor only on constr. of 362.2 mi. of line to serve 360 members—by Slope Electric Cooperative, Inc., New England. 2-2

Washington

KLICKITAT CO.—Agutter Electric Co., 952 E. Senaca St., Seattle—\$301,396 for labor only on constr. of 370.4 mi. of line to serve 418 members. Mileage includes 104 mi. of transmission line—by Public Utility District No. 1 of Klickitat Co., White Salmon. 2-2

LEWIS AND THURSTON COS.—Smith Bros., 3800 Fourth Plain Rd., Vancouver—\$154,215 for 230-kv., wood pole transmission line from Chehalis substation to Olympia substation, approx. 30 mi. in length—by Bonneville Power Administration, Portland, Ore. 2-6

Building . . .

Arizona

MARICOPA CO.—Del E. Webb Construction Co., Box 4066, Phoenix—\$573,000 for three-story and basement addition to telephone exchange bldg., Phoenix—by Mountain States Telephone & Telegraph Co., Phoenix. 2-18

PIMA CO.—M. M. Sundt Construction Co., 440 So. Park Ave., Tucson—\$261,493 for 15-classroom elementary school bldg., Michigan Ave. and Orphanage Rd., Tucson—by Elementary School District, Tucson. 2-20

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California

CONTRA COSTA CO.—Russell P. Cata-line, 1075 Cumberland St., Pittsburg—\$2,500,000 for 300 dwellings to be constr. on site betw. Fitzuren Rd. and Southern Pacific Railway from H to L Sts., Antioch—by self. 2-10

LOS ANGELES CO.—Allied Contractors, Inc., 9700 W. Pico Blvd., Los Angeles—\$1,788,984 for 254 four- and five-room, frame and stucco dwellings and 22 four-unit apartment bldgs. on north side of Century Blvd. at Bullis Rd., Lynwood—by self. 2-20

LOS ANGELES CO.—John Bayer, 13623 Ventura Blvd., Sherman Oaks—\$670,600 for 84, frame and stucco, five-room dwellings in 7700 block on Fair, Bonner, Case and Ensign Aves., Van Nuys—by Highview Manor, Inc., Los Angeles. 2-6

LOS ANGELES CO.—Bultry Corp., 9700 W. Pico Blvd., Los Angeles—\$1,607,726 for 22 apartment bldgs., four units ea., and 254 family dwellings in Lynwood—by self. 2-20

LOS ANGELES CO.—Cahill Bros., 819 Vernon Ave., Azusa—\$2,000,000, estimated cost, for reinf. conc. and steel frame brewery bldgs. at Vernon Ave. and Pacific Electric Railway tracks, Azusa—by General Brewing Corp., San Francisco. 2-20

LOS ANGELES CO.—Robert E. McKee, 4700 San Fernando Rd., W. Los Angeles—\$993,000 for five-story, reinf. conc. office bldg. for Division of Highways, Los Angeles—by Division of Architecture, Sacramento. 2-17

LOS ANGELES CO.—Reseda Park Co., 18257 Vanowen St., Reseda—\$775,000 for 73 six-room, frame and stucco dwellings in 6800 block Lindley, Garden Grove and Etwanda Aves., Van Nuys—by self. 2-20

ORANGE CO.—Malvern Homes, Inc., 116 W. Commonwealth Ave., Fullerton—\$640,000 for 56, frame and stucco, four- and five-room residences, betw. Malvern, Chapman, and Nicholas Aves., Fullerton—by self. 2-6

SAN BERNARDINO CO.—M. E. Durham, 749 W. D St., Ontario—\$700,000 for 38, four- and five-room frame and stucco dwellings west of San Antonio Ave., betw. Vesta and D Sts., Ontario—by self. 2-6

SAN FRANCISCO CO.—Cahill Bros., 206 Sansome St., San Francisco—\$1,250,000 for two reinf. conc. factory bldgs., one at Mariposa and Bryant Sts., and one at 18th and Florida Sts., San Francisco—by Best Foods, Inc., San Francisco. 2-6

SAN FRANCISCO CO.—C. Norman Peterson, 2832 Ninth St., Berkeley—\$500,000 for reinf. conc. and struct. steel sales terminal bldg., west side of Army St., opposite Pennsylvania Ave. intersection, San Francisco—by The Texas Co., San Francisco. 2-11

SANTA CLARA CO.—Gresham Construction Co., 399 So. Frances St., Sunnyvale—\$1,000,000 for 131, two- and three-bedroom, frame and stucco dwellings at Alta Camino, 0.5 mi. beyond Santa Clara city limits on U. S. Hwy. No. 101 and Pomeroy Ave.—by self. 2-27

YOLO CO.—Merritt-Chapman & Scott Corp., 17 Battery Pl., New York, N. Y.—\$17,000,000 for pulp and paper mill, 560-acre tract approx. six mi. northwest of Sacramento—by Newsom Kraft Corp., San Francisco. 2-5

Colorado

EL PASO CO.—Bonforte Construction Co., Colorado Springs—\$3,000,000 for 320,

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frame and stucco dwellings on 92-acre subdivision, Colorado Springs—by self. 2-4

Montana

RICHLAND CO.—Andrew Rockney & Son Construction Co., Sidney—\$325,000 for three-story hotel bldg. to be called La-Londe Hotel, Sidney—by La-Londe Board of Directors, Sidney. 2-2

Nebraska

DOUGLAS CO.—Peter Kiewit Sons Co., Omaha National Bank Bldg., Omaha—\$9,984,000 for Veterans Administration Hospital, Woolworth Ave., Omaha Belt Line Railroad, Center St. and 42nd St., Omaha—by Corps of Engineers, Omaha. 2-10

New Mexico

BERNALILLO CO.—O. G. Bradbury Construction Co., Albuquerque—\$384,917 general contract for first unit, 35-classrooms, offices of senior high school to be located at Jefferson and Jackson Sts., north of Coal Ave., Albuquerque—by Board of Education, Albuquerque. 2-11

BERNALILLO CO.—Haddock Engineers, Ltd., 1616 So. Greenwood Ave., Montebello, Calif.—\$1,545,997 for 152 frame and stucco housing units; water, sewer, gas systems; streets, etc., Sandia Base, Albuquerque—by Corps of Engineers, Albuquerque. 2-26

SANTA FE CO.—Robert E. McKee, Box 2848, Dallas, Tex.—\$577,083 for brick and stucco, two-story bldg., Los Alamos—by Atomic Energy Commission, Santa Fe. 2-10

Washington

BENTON CO.—T. R. Hyde, Bremerton, general contractor; Earl W. Price, Bremer, excavation contractor, and Tom Monroe of Bremerton—\$500,000 for panelizing, moving and re-erection at Richland of 200 local war housing units at Hanford project—by Atomic Energy Commission, Hanford. 2-2

YAKIMA CO.—L. A. Ritchie Construction Co., Walla Walla—\$326,837 general contract for 19-room grade school bldg. at Wapato—by Board of Education, Wapato. 2-19

Canada

BRITISH COLUMBIA—F. W. Souther Construction Co., Port Alberni, B. C.—\$850,000 general contract for four-story hotel bldg., Alberni—by Alberni Community Hotel Co., Ltd., Alberni. 2-13

Miscellaneous . . .

California

ALAMEDA CO.—William A. Smith Contracting Co., Oakland—\$172,000 to remove and constr. railroad tracks on Eastshore Freeway through the Brooklyn Basin area, Oakland—by Division of Highways, Sacramento. 2-18

SHASTA CO.—Bethlehem Steel Co., 20th and Illinois Sts., San Francisco—\$339,677 to furn. and deliver steel towers for 230-kv. transmission lines, Shasta to Cottonwood—by Bureau of Reclamation, Sacramento. 2-20

Washington

CHELAN CO.—Morrison-Knudsen Co., Inc., Box 450, Boise, Idaho—\$1,000,000 for relocation of railroad line involving constr. of 4,330 ft. of new tracks, including a 700-ft. tunnel and a 650-ft. bridge over Nason Creek, Cascade Mts., approx. 45 mi. west of Wenatchee—by Great Northern Railway Co., Seattle. 2-10

GRANT CO.—Newport News Shipbuilding & Dry Dock Co., Newport News, Va.—\$2,563,099 to furnish three 165,000-hp., 120 rpm. vertical shaft hydraulic turbines and three oil pressure actuator type governors with pumping equip. to regulate the speed of the turbines for units R-4, R-5, and R-6, Grand Coulee Power Plant, Columbia Basin Project—by Bureau of Reclamation, Denver, Colo. 2-17

GRAYS HARBOR CO.—Morrison-Knudsen Co., Inc., Hoge Bldg., Seattle—\$224,472 for clearing of approx. 20.6 mi. between Chehalis River and Cosmopolis for Olympia-Cosmopolis line—by Bonneville Power Administration, Portland, Ore. 2-20

KING CO.—R. L. Moss & Co., Zenith—\$194,104 for fishway structs., consisting of $\frac{3}{8}$ mi. gravel surf. service rds., service area, two timber bridges and site grade and excav. for reinf. conc. struct. to be erected, Puyallup River flood control proj., approx. 3 mi. south of Enumclaw—by Corps of Engineers, Seattle. 2-3

THURSTON CO.—F. E. Wilder, Rt. 6, Box 211, Olympia—\$182,600 to clear approx. 16.9 mi. betw. Olympia and Chehalis River for Olympia-Cosmopolis line—by Bonneville Power Administration, Portland, Ore. 2-20

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TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

W. Heath Talmadge has been given the position of General Manager of the ECONOMY STEEL CO. of Los Angeles. He is a mechanical engineering graduate of the University of Washington and has served in the steel business on the West Coast for the past 22 years. Talmadge will direct the Economy company's reorganized steel sales staff.

☆ ☆ ☆

Frank B. Stewart has been made Assistant Manager of the San Francisco District of UNITED STATES STEEL SUPPLY CO., San Francisco, warehouse subsidiary of UNITED STATES STEEL CORP. Stewart is a native of San Carlos, Ariz. He received a mechanical engineering degree in 1933, a master's degree in Business Administration two years later, and has been associated with United States Steel Corp. subsidiaries since 1936.

☆ ☆ ☆

The BUTLER MANUFACTURING COMPANY of Kansas City, fabricator of steel and other metal products, has completed negotiations for the acquisition of a ten-acre factory site at Richmond. The site was acquired by the company from the SANTA FE RAILWAY and includes a

large covered assembly building of steel construction containing approximately four acres of floor space. Operations at the Richmond plant will begin shortly, and employment will be between 75 and 100 at the start.

☆ ☆ ☆



Beal Shaw, Shaw Sales & Service Co., Los Angeles, has been elected as the 1948 president of the Equipment Distributors and Manufacturers of Southern California. M. R. Dinsmore, Dinsmore & Gridley, is the first vice-president, and Alex Kostyzak, Smith-Booth-Usher Co., is the second vice-president. Bert Koetters, M. P. McCaffrey Co., is the new secretary-treasurer. The board of directors includes Daley Bevis, John Carroll, and Paul Merritt.

☆ ☆ ☆

E. T. Day has been appointed Los Angeles District Sales Manager of the UNITED STATES RUBBER COMPANY Mechanical Goods Division. Day

formerly held the same position in the Salt Lake City, Utah, area and has been with the company since 1934. He succeeds L. M. Guibara who has been transferred to the position of Pacific Coast Manager of the Wire and Cable Division.

☆ ☆ ☆

E. E. Witt is now special representative in construction and industrial sales for CATERPILLAR TRACTOR COMPANY in the Western Division. Witt, a Civil Engineer, will serve as a Consultant to West Coast distributors of "Caterpillar" equipment on construction and earthmoving equipment and its application. His headquarters will be in San Leandro.

☆ ☆ ☆

George R. Sommers, formerly Pacific Coast Manager of lighting products for SYLVANIA ELECTRIC PRODUCTS INC., New York, has been appointed Director of Sales for all product divisions of the company in that area. Sommers will be responsible for directing all sales activities, distribution policies and merchandising programs for the West Coast territory. He joined the company in 1940 and has held his managerial position for the past three years. He will continue to make his headquarters in San Francisco.

☆ ☆ ☆

THE SILVER BOOSTER MFG. CO., of Los Angeles, manufacturers of an unique steering aid for crawler type tractors, is moving to their new plant on April 1, 1948. The plant is an all brick building with 5,000 sq. ft. of floor space, located at 812 So. Flower St., Burbank. The company will be combined with the F. A. STRAUB

150 HEAVY DUTY TRUCKS 150

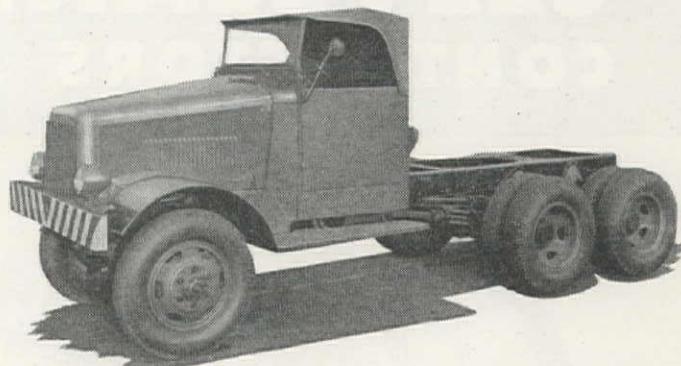
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EQUIPMENT CO., which will make parts for the boosters. Thomas Traphagen of Hardin, Montana, has been appointed as General Sales Manager covering domestic and foreign sales. He is in the Caribbean Islands at the present time opening new markets for the company's product.

★ ★ ★

Thomas J. Bannan, president of WESTERN GEAR WORKS and PACIFIC GEAR & TOOL WORKS, with plants in Seattle, Los Angeles and San Francisco, was recently elected a national vice-president of the NATIONAL ASSOCIATION OF MANUFACTURERS



during the meeting of that group in New York City. During 1947, Bannan served as Vice-Chairman of the Resolutions Committee of the NAM and has recently completed his term of office as president of the AMERICAN GEAR MANUFACTURERS ASSOCIATION.

★ ★ ★

MACK-INTERNATIONAL MOTOR TRUCKS CORP. of New York City, has made C. E. Cole District Manager in charge of the Los Angeles branch, with headquarters at 1501 So. Central Ave.

★ ★ ★

PACIFIC NORTHWEST

C. N. Reitze has been elected president of the SUPERIOR PORTLAND CEMENT CO., Seattle, to succeed the late E. P. Lucas, who headed the company until his death on Jan. 19. Other officers of the company include N. H. Nelson, vice-president and general manager; J. B. Loughary, secretary and sales manager; and H. E. Thompson, treasurer.

★ ★ ★

SOULE' STEEL CO., of San Francisco, has opened a branch office in Seattle under the direction of Jean B. Thibault, Jr. Thibault was formerly with the Acme Ornamental Iron Co. He will maintain a complete service for architects, contractors, and material dealers throughout the state of Washington.

★ ★ ★

Tom L. Drake has been promoted to the position of general manager for the MULTNOMAH IRON WORKS, manufacturing division of R. M. WADE & CO., Portland. Drake has been with the Wade firm for 25 yr., having served most recently as assistant to the general manager. Multnomah manufactures portable sprinkler irrigation systems, and portable and tractor powered saws in addition to other agricultural and industrial equipment.

★ ★ ★

THERMLITE MANUFACTURING CO., building insulation manufacturing firm of Spokane, has been purchased by G. T. Ashe, formerly of Piedmont, Calif., from Warren Latham, former owner and operator.

★ ★ ★

George H. Jamison, long secretary and sales manager for A. H. COX & CO., Seattle equipment distributor, has been elected president of the firm. A. H. Cox, founder and former president, has retired to the position of chairman of the board, but will continue an active interest in several of the firm's accounts. Jamison has

been with the firm since he joined as a salesman in 1919. Other officers for A. H. Cox & Co. are J. H. Widrig, vice-president, and C. J. Higman, secretary-treasurer.

★ ★ ★

AIR REDUCTION PACIFIC COMPANY, the new subsidiary of AIR REDUCTION COMPANY, INC., New York, N. Y., recently organized to take over the West Coast business of the Air Reduction Sales Company, has appointed four vice-presidents. L. A. Hamilton will serve in the company's Seattle district with offices at 3623 East Marginal Way, Seattle, Wash. E. W. MacCorkle, Jr. will be located at the Portland district offices at 430 N.W. 10th Ave., Portland, Ore. H. W. Saunders, vice-president in charge of the San Francisco, Calif., district at 1485 Park Ave., Emeryville, Calif., has been with the company for about 30 years. H. A. Hoth is to be vice-president in charge of the Los An-

geles, Calif., district with offices at 2423 E. 58th St., Los Angeles.

★ ★ ★

INTERMOUNTAIN

The FRY EQUIPMENT CO., 525 So. 11th St., Abilene, Texas, will handle all the products of the DAVEY COMPRESSOR CO., Kent, Ohio, in the north central portion of Texas. Dealership territory will cover forty-one counties.

★ ★ ★

DARCO, INC., a newly organized firm in Great Falls, Mont., has entered the building materials field and will represent a number of manufacturers in Montana, northern Wyoming, northern Idaho, and eastern Washington. Donald A. Roberts, former representative for Celotex Corp., and Robert Darling, former executive vice-president of the Great Falls chamber of



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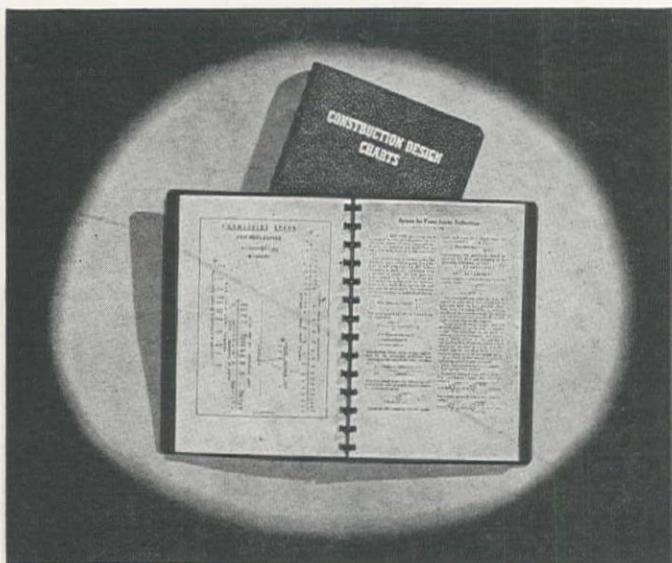
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Position..... Company.....

commerce, are partners in the new organization.

☆ ☆ ☆

Lynn H. Johnson, Jr., will manage the new branch recently opened by the MINNEAPOLIS - HONEYWELL REGULATOR CO. at 1514 E. Central, Wichita, Kans. Johnson has been sales manager of the company's gas controls division until his latest promotion. Other personnel of the new office include Donald D. Baker, sales engineer for the industrial instrument division; Robert F. Perkins, sales engineer for the heating controls division and Robert F. Jamison, air conditioning controls sales engineer. Lloyd Taylor will be in charge of air conditioning controls service and installation.

☆ ☆ ☆

INTERNATIONAL HARVESTER COMPANY, Chicago, Ill., has announced that R. L. McCaffrey, formerly sales promotion man at Lincoln, Nebr., has been appointed assistant manager at that branch. J. R. Scott, formerly assistant manager at Lincoln, Nebr., has been transferred to Grand Island, Nebr., in the same capacity.

☆ ☆ ☆

BLAKESLEE & BAUER HARD MATERIALS CO. entered the construction materials sales field in Boise, Idaho, during January. The company will deal in plaster, cement, lime, plaster lath, channel iron and other items of construction materials. Guy Blakeslee and Charles Bauer are partners in the venture.

☆ ☆ ☆

AMONG THE MANUFACTURERS



NORTHWEST ENGINEERING CO., Chicago, recently presented its agency, RUSSELL T. GRAY, INC., Chicago, with a bronze plaque "in appreciation of twenty-five years of service devoted to the sale of Northwest equipment." W. J. HIGGINS, vice-president, makes the presentation to HARVEY A. SCRIBNER, president of the agency, while RUTH BAN, secretary-treasurer, smiles her approval.

Charles F. Jarrard has been elected President of the MIDLAND STRUCTURAL STEEL COMPANY, Cicero, Ill. William Nemec became Secretary-Treasurer, and O. C. Robbins Vice President. O. A. Scudder retired as President of the company and B. N. Braun as Secretary-Treasurer.

☆ ☆ ☆

CATERPILLAR TRACTOR CO., Peoria, Ill., announces the appointment of W. K. Cox, formerly Assistant General Sales Manager, as Advertising Manager of the company. Gerald M. Walker, Advertising Manager since 1931, has retired. J. J. Valentine, who was Central Division Sales Manager, succeeds Cox. F. D. Haberkorn now becomes Central Division Sales Manager and Herman S. Eberling, currently

a Western Division District Representative, will replace J. W. Mohler as Assistant Central Division Sales Manager. Mohler assumes the post of Sales Training Division Manager.

☆ ☆ ☆

E. George Hartmann has been appointed as general sales manager of JOHN A. ROEBLING'S SONS COMPANY, Trenton, N. J. Hartmann is a member of the Wire Association and the American Iron and Steel Institute. He has been associated with the Roebling Company since 1940.

☆ ☆ ☆

Pardee H. Frank, Service Manager of THE TIMKEN ROLLER BEARING COMPANY, Canton, Ohio, retired February 1st after 27 years of continuous service. He is replaced by Elmer Anderson, who has been Assistant Service Manager

for the past year and a half. William A. Fowler, General Manager of the Timken Company's Columbus, Ohio Plant since 1929 retired on January 31st. L. D. Gable, Factory Manager of the Columbus Plant for the past three years, becomes General Manager.

☆ ☆ ☆

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis., has joined the Army's Affiliation Program by agreeing to sponsor an Ordnance unit of the Organized Reserve Corps. Main objective of the affiliation plan is the development of key units within industry which can be materialized quickly and efficiently in the event of a national emergency. Members of these units will perform special duties based on their normal occupations. The Allis-Chalmers unit will be trained as a service group for combat troops. The



THIS TUNNEL LINER

puts the Gopher to shame

When it comes to speedy tunneling the gopher is among nature's best, but the little fellow can't begin to compete with men using ARMCO Tunnel Liner Plates.

Here is tunnel liner with ample strength to do a real "he-man" job, yet light enough to permit easy handling and rapid installation. An unskilled

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You'll also find ARMCO Tunnel Liner Plates cost less to carry a given load than any other type of liner. Use them for sewers, conduits and similar structures under busy streets, highways and railroads. Gages range from No. 14 to No. 3; diameters from 45 $\frac{1}{4}$ inches to 33 feet. Write.



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ARMCO TUNNEL LINER PLATES

unit will consist of 5 officers, 1 warrant officer, and 192 enlisted men.

☆ ☆ ☆

August R. Maier is the Director of Engineering and **Alexander Quayle** is now Chief Engineer of OIL WELL SUPPLY COMPANY, Oil City, Pa. Maier has been with the company since 1930. He will make his new headquarters in Dallas, Texas. Quayle was formerly Assistant Chief Engineer.

☆ ☆ ☆

Myron W. Krueger is now treasurer of RAYMOND CONCRETE PILE COMPANY, heavy construction contractors of New York, and **Howard P. Maxton** is the secretary and assistant treasurer. Maxton was assistant secretary and assistant treasurer since he joined the company in 1945.

These new officers will fill the vacancy created by the retirement of **Paul D. Case**, who will continue as a director.

☆ ☆ ☆

The CHICAGO PNEUMATIC TOOL COMPANY, New York, N. Y., will construct a new plant in Utica, New York, this spring. The plant will be one of the most modern industrial buildings in the East. With over a half-million feet of floor space, all on one story, it has been designed in accordance with the newest techniques in materials handling, work simplification, and safety.

☆ ☆ ☆

The United States District Court at Wilmington, Del., has dismissed the complaint filed several months ago by the Department of Justice against UNITED STATES

STEEL CORP., its West coast subsidiary, COLUMBIA STEEL CO., and CONSOLIDATED STEEL CORP. of Los Angeles. This complaint alleged that the proposed acquisition by Columbia Steel of the steel fabricating assets and business of Consolidated Steel would be in violation of the anti-trust laws. The decision rendered by the court held that there was no evidence in the case of a monopoly and that the defendants were entitled to a judgment dismissing the complaint.

☆ ☆ ☆

Dr. Fred E. Kendall has been appointed Director of Research of THE MASTER BUILDERS CO. of Cleveland, Ohio. He will be head of the laboratory working with **Dr. W. W. Scripture, Jr.**, Vice-President in Charge of Research.

RUBBER Footwear

With "TIRE

TREAD" Sole

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MINER'S PACS AND BOOTEES

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A MOUTHFUL AT EVERY BITE

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, Calif.

Paving Finisher

Manufacturer: Jaeger Machine Co., Columbus, Ohio.

Equipment: New diagonal screed finishing machine.

Features claimed: The machine is equipped with a transverse front screed and a pivoted rear screed which the operator can swing diagonally in either direction to operate at whatever angle best suits the work.



When finishing super-elevated curves, the angle of the rear screed causes it to carry the desired amount of material uphill to compact solidly against the higher form. Gradual adjustments of the screed angle can be made without stopping as the machine approaches and leaves super-elevated curves.

Materials Handling Device

Manufacturer: Bell Aircraft Corp., Buffalo, New York.

Equipment: Prime Mover with a bucket or steel and wood platform deck.



Features claimed: The device has a 1000-lb. capacity and is geared and powered to climb a 20 per cent grade with a full load. It is powered by a 3 h.p. air-cooled engine and operates for eight hours on three gallons of fuel. Transmission, clutch and gears are completely enclosed and no belts or chains are used to transmit power from the engine. The bucket has a capacity of 10 cu. ft. and the addition of sideboards raises the

capacity as high as 18 cu. ft. for lighter materials. Both the platform and the bucket dump automatically, and then return to a level, locked position.

Non-tilting Concrete Mixer

Manufacturer: Muller Machinery Co., Inc., Metuchen, N. J.

Equipment: New 3½ S mixer.



Features claimed: The machine is carefully balanced for easy handling and is built along the same lines as a big mixer. The drum and drumheads are made of heavy steel plate and revolve on wide solid rubber tires.

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3-SPEED ALL-STEEL

HAND WINCH

3 Ton "Junior"—Drum capacity: 150 ft. of ½" cable; wt. 75 lbs; \$60

5 Ton "Standard"—Drum capacity: 325 ft. of ½" cable; wt. 135 lbs; \$85

5 Ton "Heavy Duty"—Drum capacity: 325 ft. of ½" cable; wt. 140 lbs; \$90

Power-models also available.

Write for literature.

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DATA BOOK FOR CIVIL ENGINEERS

Volume III—FIELD PRACTICE

Furnishes complete working material
for the field engineer and inspector

By ELWYN E. SEELEYE
Consulting Engineer

The third volume of this excellent series, described as having "no counterpart in the field of Civil Engineering," is directed to the field engineer or inspector. It furnishes him with sufficient data for carrying on any aspect of his work.

The book is divided into two sections. Part I, INSPECTION, not only provides outlines of procedure for inspection, but also contains checklists for inspectors in varied types of civil engineering work including concrete, masonry, welding, timber, foundations, grading, and structural steel. A discussion of the procedure for conducting field tests is included, as well as report forms and over 80 data tables.

The second part covers surveying—a necessity for a field engineer. Topics under discussion include: stakeout problems, instrument adjustments, azimuth determination, and plotting problems.

1947

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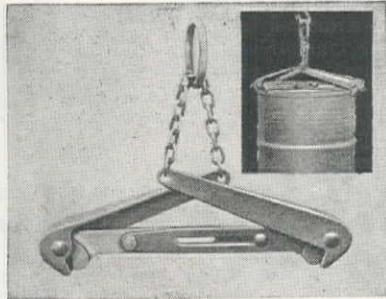
WCN-3-48

ber rollers with guide rollers provided for holding true running location and preventing weaving of the drum. The machine is equipped with an automatic water tank which can be set for predetermined quantities of water. The drum is gear driven and a heavy roller chain transmits the power from the engine to the countershaft. The complete unit weighs approx. 1,000 lb.

Chime Tongs

Manufacturer: Downs Crane and Hoist Co., Los Angeles, Calif.

Equipment: Tongs for moving and loading drums.

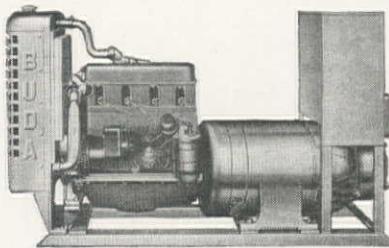


Features claimed: The tongs handle all drums with or without heads from 18 to 24 in. in diameter. The lifting arms are self-equalizing and both jaws have the same positive grip. Holding power is not affected by greasy surfaces and jaws will not damage the drums. A drum can be lifted out of a tier without disturbing the surrounding drums. Open drums can be handled without danger of spilling the contents.

Electric Generators

Manufacturer: The Buda Co., Harvey, Ill.

Equipment: New line of industrial gasoline engine electric generator sets.



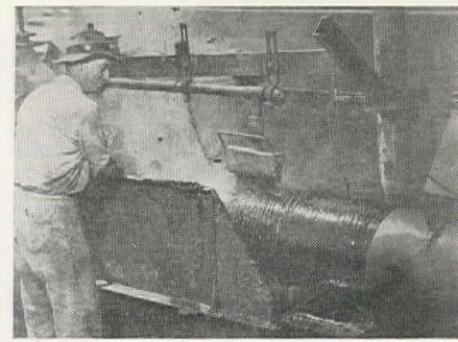
Features claimed: The sets are available with DC or AC output, single or three phase and in sizes from 10 to 125 kw. Each set is complete and fully equipped with controls, generator, radiator, and engine all mounted on a self-contained base. Gasoline engines are water cooled, have an electric starter, lubricating filter and air cleaner.

Protective Pipe Coating

Manufacturer: National Petroleum Sales, Inc., Los Angeles, Calif.

Equipment: Pipe coating compound to resist corrosion and physical damage.

Features claimed: The coating resists electrolysis and corrosion, the destructive electro-chemical reaction which necessitates most pipe repair. It has outstanding shock impact resistance and great ductility to withstand severe earth shock or movement. Because of its stability, earth pressures will not cause it to "slump" or



"creep." High flash and fire point adds to its safety factor during application. The easy to apply coating is resistant to alkalis and soil acids and has a high bonding characteristic to metal or concrete.

Street Cleaner

Manufacturer: Rosco Manufacturing Co., Minneapolis, Minn.

Equipment: New street cleaner which can also be used for paving operations.



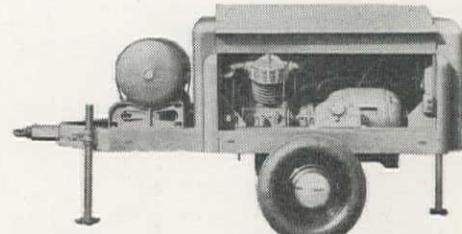
Features claimed: The unit will pressure flush and sprinkle streets, clean sewers, sweep wet or dry, spray trees and shrubs and fight fires. A full width water blanket spray in front of the 7-ft. brush prevents dust clouds ordinarily associated with dry sweeping. The brush life is lengthened by constant wetting through auxiliary piping.

Portable Compressors

Manufacturer: Davey Compressor Co., Kent, Ohio.

Equipment: New line of electric compressors.

Features claimed: The units are available on skid, 2-wheel trailer and 4-wheel trailer



mountings. Compressors are of two-stage construction with intercooler and safety valve. They are direct driven from 1,200 rpm., 220/440 volt AC motors of squirrel cage, horizontal type. Motor starters are full voltage, AC magnetic non-reversing, with heaters for motor protection. Capacities in the new line are 60, 105, 160, 210 and 315 cu. ft. per min.

Sump Pump

Manufacturer: Gardner-Denver Co., Quincy, Ill.

Equipment: New top suction sump pump.

Features claimed: The pump embodies a new principle, "top suction." Because of this feature, the oil seal is subjected only to

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ALL fluid problems met: automatic check for use in pump discharge lines; liquid level control for maintaining level at predetermined limits; pressure regulating service, stop valves for shut-off purposes, and free discharge service as may be required! Write to:

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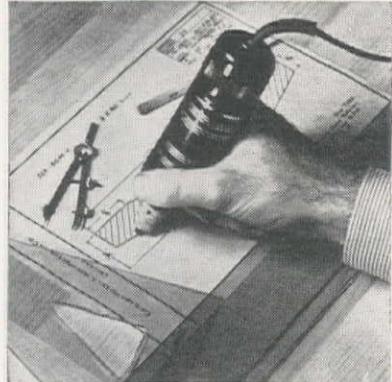
static pressure from depth of immersion when the pump is not in operation. When the pump operates, water cannot reach the oil seal on the air motor. The pump is operated by a vane-type air motor. The pump impeller of the closed type is made of hard, abrasion-resistant alloy.

Electric Eraser

Manufacturer: Chicago Wheel & Manufacturing Co., Chicago, Ill.

Equipment: Light weight, electrically powered erasing unit.

Features claimed: The unit is balanced and shaped to fit the hand. Total weight is



but 12 ounces. All moving parts except the rubber eraser are completely covered by a protective sleeve. A quick-change eraser chuck accepts any standard eraser. Sharp, keen erasings can be made to save much time and assure neater drafting work. Optional equipment is an easy to operate foot switch.

Small Hauling Unit

Manufacturer: Frank G. Hough Co., Libertyville, Ill.

Equipment: 2 cu. yd. capacity buggy for handling of bulk materials.



Features claimed: The four-wheeled, pneumatic-tired unit is powered by a gasoline engine and has a hydraulically-dumped body. It is built low and compact with a short wheel base and rear wheel steer so it can operate in congested low head-room areas and through narrow doorways. Overall height is 5 ft., 8 in. Hydraulic brakes plus full visibility in every direction allow high speed travel with complete safety.

Portable Trough Conveyor

Manufacturer: George Haiss Manufacturing Co., Inc., New York, N. Y.

Equipment: Conveyor for handling loose materials.

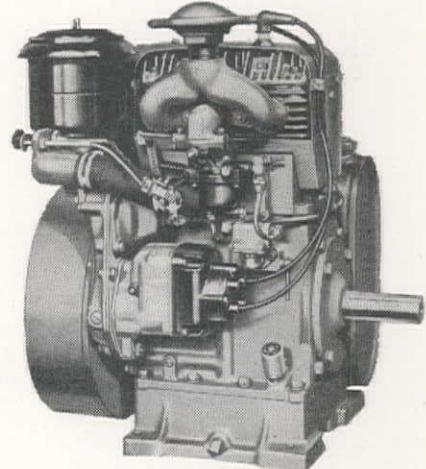
Features claimed: The improved conveyor is designed especially for the handling of loose materials such as sand, gravel, stone, loam, cinders, chemicals, fertilizer, etc., from hopper bottom cars to trucks or

storage piles or from storage piles to trucks or bins. It is ideally suited for handling concrete from mixers to forms. It is built in standard belt widths of 16, 20 and 24 in., and standard lengths from 20 to 60 ft. in multiples of 5 ft. The conveyor is mounted on steel or rubber tired wheels and fitted with electric or gasoline engine. Capacity is from 60 to 180 tons per hour.

Air-Cooled Engine

Manufacturer: Wisconsin Motor Corp., Milwaukee, Wis.

Equipment: Two-cylinder, 4-cycle air-cooled engine.



Features claimed: Positive cooling is obtained from a large fan cast in the flywheel which forms a blast of air around the cylinders and heads. Compactness and light

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Frankly, we think the two cat skinners above are overdoing things a little bit, but it does go to show how much they depend on Silver Steering Boosters to eliminate slow, cumbersome steering. S.S.B.'s PERMIT ONE FINGER OPERATION OF STEERING LEVERS! • In addition, Silver Steering Boosters cut maintenance costs to the bone, because they assure opening clutches full travel every time!

- Very Inexpensive
- 30 Minute Installation
- Immediate Delivery
- Write for Complete Literature

SILVER BOOSTER Mfg. Co.

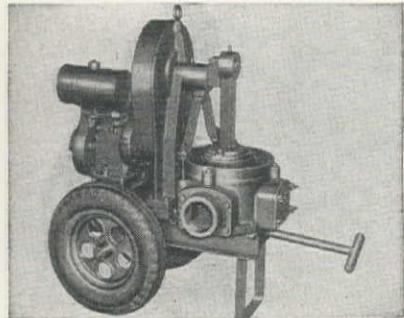
1406 S. Grand Ave., Los Angeles 15, Calif.

weight are obtained using the air-cooled design. Engineering features are the tapered roller main bearings, counterbalanced crankshaft, mirror finish on crank pins, molybdenum iron valve seat inserts and honed cylinders. The standard engine weighs 220 lb., operates at 1,600 to 2,600 rpm, and is rated up to 13.3 h.p.

Diaphragm Pump

Manufacturer: Carver Pump Co., Muscatine, Iowa.

Equipment: Newly developed pump with capacity from 1,000 to 6,000 gal. per hr.



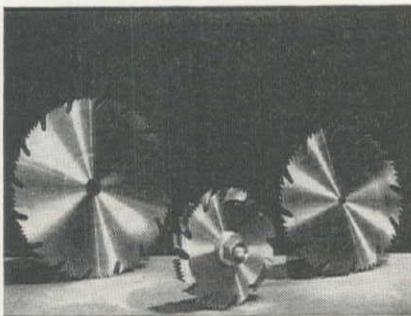
Features claimed: Designed for long life and hard use, the only moving part of the new pump exposed to gritty water is the highly durable live-rubber diaphragm, and this can be quickly and easily replaced if it becomes necessary. All anti-friction roller bearings are used on pump rod and in main transmission. Other features include the high accessibility of the non-clogging valves for inspection or removal, the completely enclosed transmission, large water passage for free flowage and an easily accessible clean-out hand hole. Available with

gasoline engine, electric motor or without power source, the pump is mounted on a rubber-tired, easy rolling two-wheel truck.

Circular Saw

Manufacturer: Chicago Saw Works, Chicago, Ill.

Equipment: Saws for all types of cutting.



Features claimed: The saws are individually balanced to insure a well-balanced, quiet running saw. They are accurately heat treated to the correct degree of toughness, and carefully checked for proper tension. Material is the best quality saw steel. A type and size of circular saw is available for any desired use. Illustrated are the planer saw for both rip and cut-off, the Dado head for cutting any width groove, and the flat ground combination saw for a fast, clean cut with or across the grain.

Finned Tubes

Manufacturer: Fintube Coil Corp., Monterey Park, Calif.

Equipment: Bell end finned tubes.

Features claimed: The tubes are suitable

for use in generator air coolers, aftercoolers, economizers or other heat exchangers. The bell end facilitates retubing through large hole in tube sheet. Serrated fins insure maximum heat transfer. Admiralty tubing has copper fins solder-bonded to tubing. All steel can be supplied for high temperatures.

Combination Hoist and Jack

Manufacturer: Coffing Hoist Co., Danville, Ill.

Equipment: Unit designed to lift or move heavy loads on construction jobs.

Features claimed: Complete with only three pieces (stand, hoist and handle), the new unit has a rated capacity of 2,000 lb., yet weighs only 23 lb. complete. The hoist with ratchet-and-pawl construction uses the smallest possible number of working parts. A "safety-load" handle is designed to bend at maximum overload before there is any possibility of the chain breaking or of the hooks straightening out. The stroke at the top brings the handle to a level just even with the top of the hoist frame horizontally so little headroom is required. The hoist unit can be mounted on the stand in a few seconds' time to obtain a sturdy, powerful jack.

Tracing Paper

Manufacturer: Clearprint Paper Co., San Francisco, Calif.

Equipment: Technical drawing paper to replace tracing cloth.

Features claimed: The paper claims the advantages, without the drawbacks, of tracing cloth. "Papercloth" shows a marked stability under all atmospheric conditions, resisting stretching, shrinking and buckling. Its surface takes to pencil and ink

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Here's a portable asphalt mixer that will handle all types of small asphalt mixing jobs. The Foote Kinetic Mixer is ideal for handling asphaltic mixes for driveways, sidewalks, tennis courts, floors and parking areas. It can be taken anywhere, towed behind a car or truck. Will handle hot or cold mixes...3 cu. ft. in 30 seconds. This mixer gives a high volume output for a small investment. It employs a new mixing principle that assures a thorough coating of aggregate. For details, write for Bulletin K-100.

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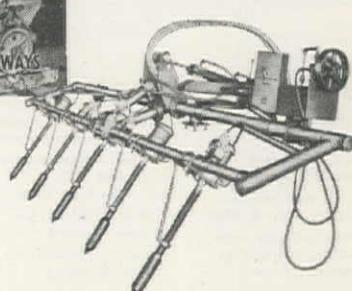
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with equal facility and erases easily. It is not damaged by creases or folding, so outlasts tracing cloth in printing and reproductive qualities.

Hand Torch

Manufacturer: Air Reduction Sales Co., New York City.

Equipment: New hand torch for cutting stainless steel.

Features claimed: The three tubes of the torch are constructed of stainless steel for



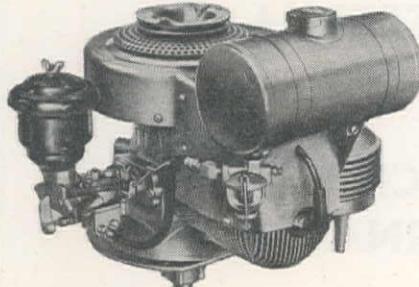
rigidity and heat resistance. The stainless steel lever and ribbed handle are designed to afford maximum ease of operation. A remote control cut-off automatically coordinates the flux feed with the cutting oxygen, eliminating separate flux control. It uses standard cutting tips and has a monel metal head for durability. The new torch is available in 21- or 36-in. lengths, both having a 90 deg. torch head.

Gasoline Engine

Manufacturer: McCulloch Motors Corp., Los Angeles, Calif.

Equipment: Improved vertical-shaft engine.

Features claimed: Rated at 2½ h.p. at 2,500 rpm., this new die-cast engine weighs only 24 lb. An oil-bath air cleaner and a visible sediment-type fuel filter protect the



engine against abrasives encountered in outdoor applications. All bearings, including thrust bearings, are the anti-friction type. The design of the engine permits direct coupling to vertical pumps and other engine driven products requiring vertical drives.

New Steel Reinforcing Bar

Manufacturer: Bethlehem Pacific Coast Steel Corp., San Francisco, Calif.

Equipment: Reinforcing bar with greater bond strength in concrete and easier to handle for both fabrication and erection.

Features claimed: The improved bar is essentially round in cross section. A single wave rib on each side of the bar gives the greater bond strength. The bars are rolled exclusively from new billet steel in accordance with A.S.T.M. Specifications A-15-39. The new design was developed after intensive research in the laboratory.

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.

SPECIFIC DATA SHEETS—Irvington Form & Tank Corp., New York, N. Y., is offering a new idea in catalogs which is emphasizing accessibility of information and convenience of form. Data of interest to inquirers, and to the building industry as a whole, have been assembled on loose-leaf sheets in a pocket-size folder, cleverly folded to form retaining devices. Descriptions of Irvington products, methods and advantages are included, as well as facts of general interest. Comparative construction costs with wood and steel foundation

forms, descriptions of various types of forms, and quotations from the experiences of builders are among the data included.

READY-MIX HANDLING—The Duncprete Division of the Maxon Construction Company, Inc., Dayton, Ohio, announces a new pamphlet which illustrates the wide acceptance of their Duncprete body by the ready-mix concrete industry to haul air-entrained concrete without agitation. Action pictures show its use by well known ready-mix producers from coast to coast.

QUARRY PLANT—Pioneer Engineering Works, Minneapolis, Minn., now has available for general distribution to the aggregate producing industry a new booklet describing its line of combination portable 2-unit crushing and screening plants. The booklet covers primary and secondary rock and gravel plants, featuring the portability and versatility of the plants to meet the varying conditions for aggregate pro-

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duction. Complete specifications are given, together with a guide to proper selection of equipment.

BUTTERFLY VALVES—The Henry Pratt Company of Chicago, Ill., manufacturers of utility and industrial plant equipment, have just released a new catalog covering their widely-used line of Pratt Rubber Seat Butterfly Valves. The sixty page hard cover volume is the most elaborate effort as yet undertaken by the Company to provide detailed description and specifications of the valves and their accessories. The book was designed for engineers, with emphasis upon actual blueprint reproductions for reference to work in progress.

JAW CRUSHERS—Lippmann Engineering Works, Milwaukee, Wis., has just issued Bulletin 1100 on their Grizzly King Jaw Crushers. Developing the theme of lower cost per ton crushed, the 12-page three color catalog contains sales and engineering information, including weights, dimensions and capacities. Photographs and diagrams illustrate the text.

FIVE MACHINES IN ONE—Wayne Crane Division, American Steel Dredge Company, Inc., Fort Wayne, Ind., has just released a 20-page illustrated catalog No. 406 describing the one-man operated, rubber-tired machine serving as a 5-ton crane, $\frac{1}{2}$ -yard clamshell, $\frac{1}{2}$ -yard dragline, $\frac{1}{2}$ -yard power shovel or $\frac{1}{2}$ -yard trench hoe. Two booms and attachments are interchangeable. The catalog gives complete operating and specification data.

SPEED PRIME PUMPS—Chain Belt Company of Milwaukee, Wis., has just published Bulletin No. 47-12, illustrating and describing the complete new line of Rex

"Easy Flow" Speed Prime Pumps. In the catalog the design advancements of the pumps are described in detail and pictured by cutaway and "exploded" photos. Detailed specifications and two pages of helpful application information and tables are included.

TANDEM ROLLER—The Galion Iron Works & Manufacturing Co., Galion, Ohio, has available an eight page catalog on the new Galion 3-5 ton tandem roller. The four color catalog gives detailed construction views and data, as well as complete specifications concerning weights, compression, etc. The 3-5 ton tandem roller is widely used on new construction work, rebuilding and widening of old roads, and maintenance jobs of all kinds. It is said to be excellent for "close quarter" rolling.

WELD TO RECLAIM—American Manganese Steel Division of American Brake Shoe Co., Chicago Heights, Ill., has published a 30-page booklet describing Amsco welding products manufactured in a wide range, each especially suited to the application for which it was developed. The material contained in this book defines those applications which have been field tested and proved over a period of many years. The book gives descriptive information on hard-facing and build-up rods and electrodes, and weldments. Action photos and pictures of reclaimed parts amply illustrate the contents.

SALITILLO WORKS—International Harvester Company, Chicago, Ill., has published a colorful 32-page booklet titled "Harvester in Mexico." The book tells the story of Harvester's Saltillo Plant, and of the cooperation between Mexico and Harvester to assist in the agricultural development of Mexico. The Company's Chicago

representatives as well as visiting the Saltillo works, also spent time in Monterrey, Nuevo Leon; Mexico City; and Mexico's Pacific coast area where the great irrigation projects are bringing new life to the land.

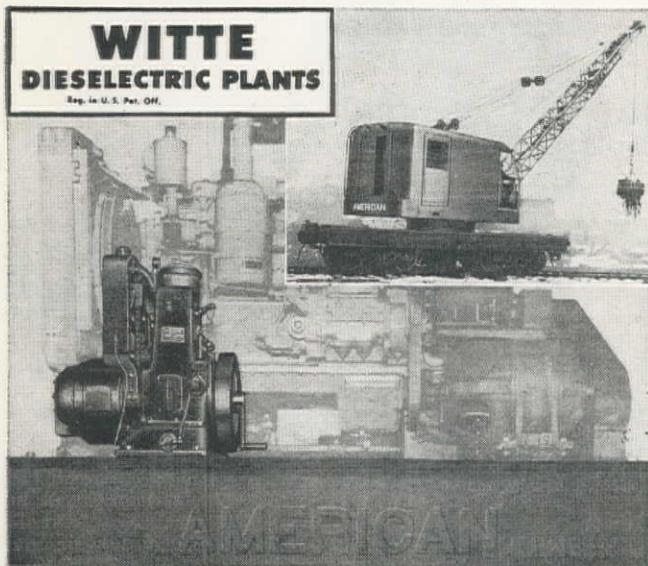
INDUSTRIAL DATA SHEET—National Safety Council, Chicago, Ill., has released a revised Industrial Data Sheet titled "Motor Graders, Bulldozers, and Scrapers." Precautions that should be taken to protect operators of road machinery, other workers on the job, members of the public who may be exposed and to control damage to equipment are explained in this release. The responsibility of management and workers is thoroughly gone into. Action photographs and drawings illustrate the text. The cost of the data sheet to non-members of the National Safety Council is:

1 to 9	10 to 99	100 to 999	1000 or more
.30	.20	.12	.10

Price to members is one-half the above.

WAGONJACKS—Ingersoll-Rand Company, New York City, N. Y., has released a new color bulletin No. 4070 discussing the use of Wagonjacks and their distinctive features. Designed for use with either the new J-50 Jackhammer, or the DA-30 light-weight Drifter. The Wagonjack has a wide field of application in construction work, road building, and mining. Photographs show the jack, and its various parts are described.

ELECTRODE SELECTION CHART—Harnischfeger Corporation, Los Angeles, Calif., has available for distribution a P&H Electrode Selection Chart giving the complete listing of P&H electrodes in all types, including mild steel, alloy steels,



(Photo courtesy American Hoist & Derrick Co.)

WITTE supplies reliable auxiliary power on construction equipment . . .

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stainless steels, for welding cast iron, and for hard surfacing. The chart includes the AWS or AISI classifications in accordance with NEMA color chart, physical properties and sizes available, and a description of the general characteristics of each electrode. A complete listing of electrodes from which one can be selected for any particular job and a world of information for the welding shop also appear.

WELDING AND CUTTING—Victor Equipment Company of San Francisco, Calif., has issued a welding and cutting supplies catalog which may be placed in permanent catalog reference files. The four-color front cover is not merely a truly fine example of the photographer's, the photo-engraver's and the layout artist's craft, but a most useful method of telling at a glance what the 84 pages, crammed with information and fine illustrations, embrace.

FOR SALE—120 Buckeye Trenching machine, A-1 condition and ready to go. Digs from 24 to 42 inch trench up to 1½ ft. deep. • 35 Caterpillar tractor with hydraulic pump and 7 ft. dozer blade, excellent condition. • 3 axle heavy-duty Low-Boy trailer for above equipment.

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ONE FAIRBANKS-MORSE SEMI DIESEL ENGINE Model Y — 15 H.P. Style H — RPM. 400. Engine #433714. Single Cylinder. Location—Bakersfield \$50.00

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PACIFIC JAW CRUSHER. 14" x 28", Serial 63 Completely overhauled. Location—Alloy Steel & Metals Co., 1862 East 55th St., Los Angeles, California \$4000.00

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