WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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DECEMBER • 1947

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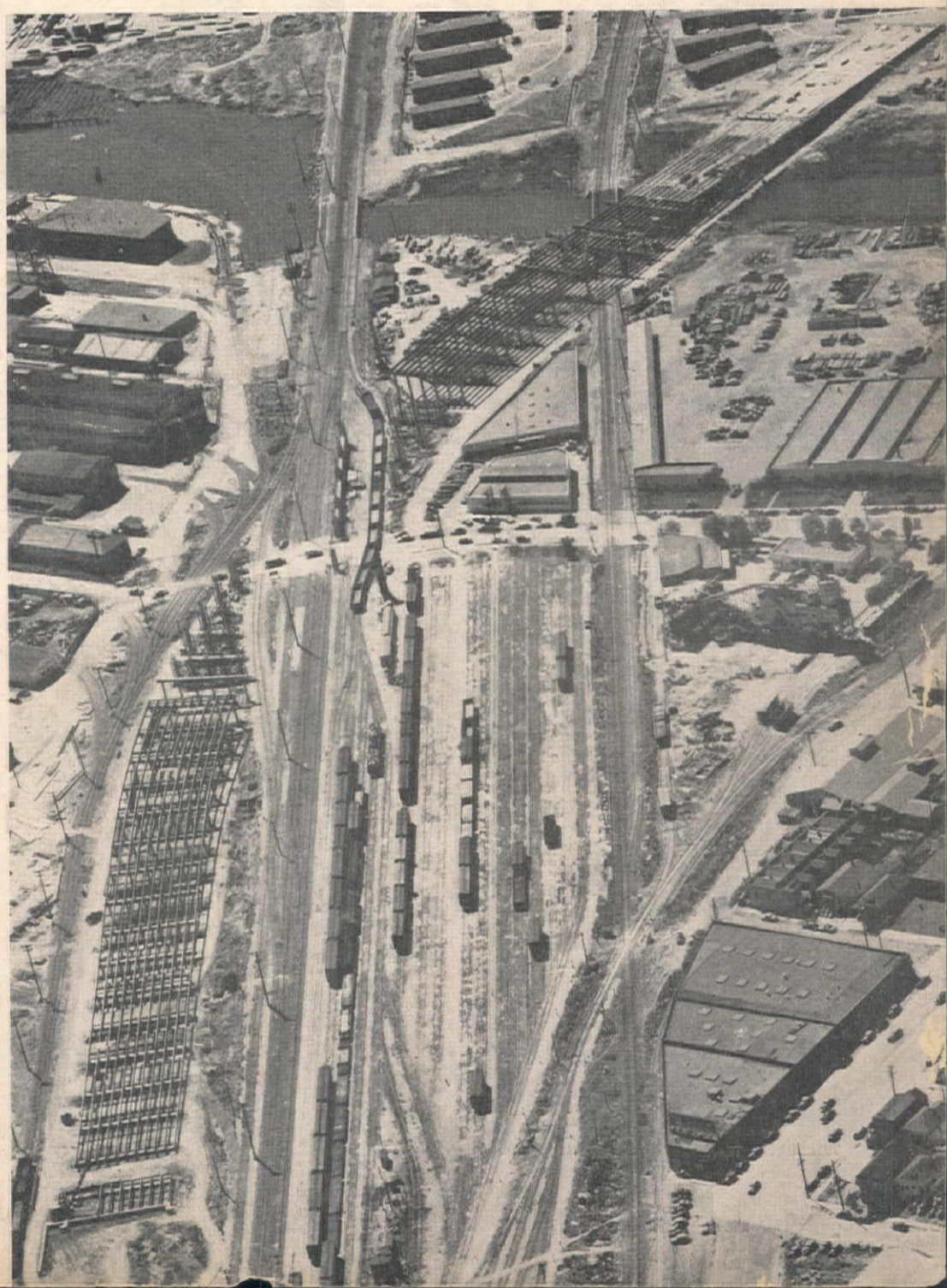
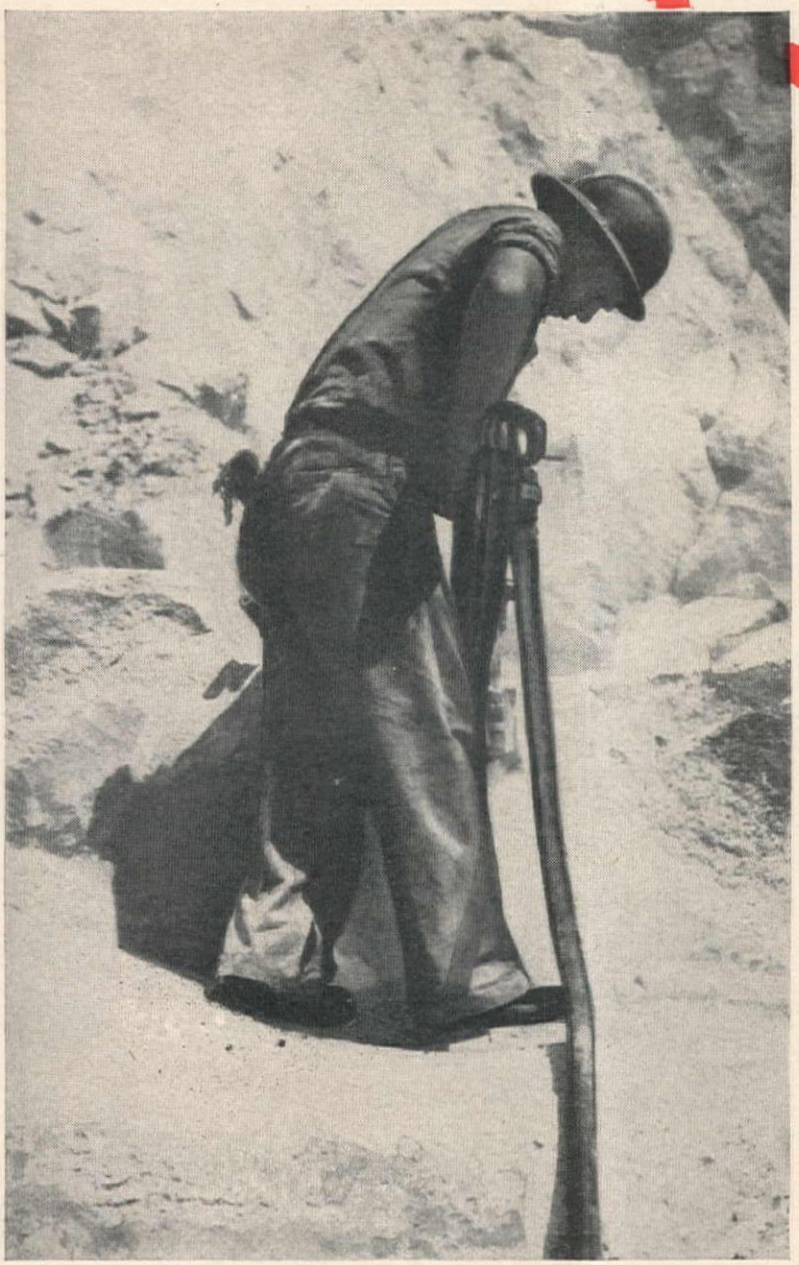
IN THIS ISSUE



The Fifth Ave. Overhead in Oakland, Calif., first Eastshore Freeway structure to near completion, curves gracefully over two main line railroads, Lake Merritt canal and the Avenue. Unstable foundation conditions and interruption of work by rail traffic were problems facing joint contractors Duncanson-Harrelson and Stolte, Inc.

THIS OIL "MAKES" YOUR DRILLS...

- turn in more footage
- require less servicing
- last much longer



You can drill more footage per shift . . . and your drills will last longer, require less servicing . . . when you use Texaco Rock Drill Lubricants E.P.

Texaco Rock Drill Lubricants E.P. are especially made to keep rock drills working at their best. Their "extreme pressure" characteristics are more than ample to protect moving parts even under the severest conditions. They resist oxidation, flow readily, prevent rust and corrosion whether drills are running or idle.

Texaco Rock Drill Lubricants E.P. are approved by leading rock drill manufacturers. Use the grade recommended for your particular drills and operating conditions.

A Texaco Lubrication Engineer will gladly work with you. Just call the nearest of the more than 2500 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

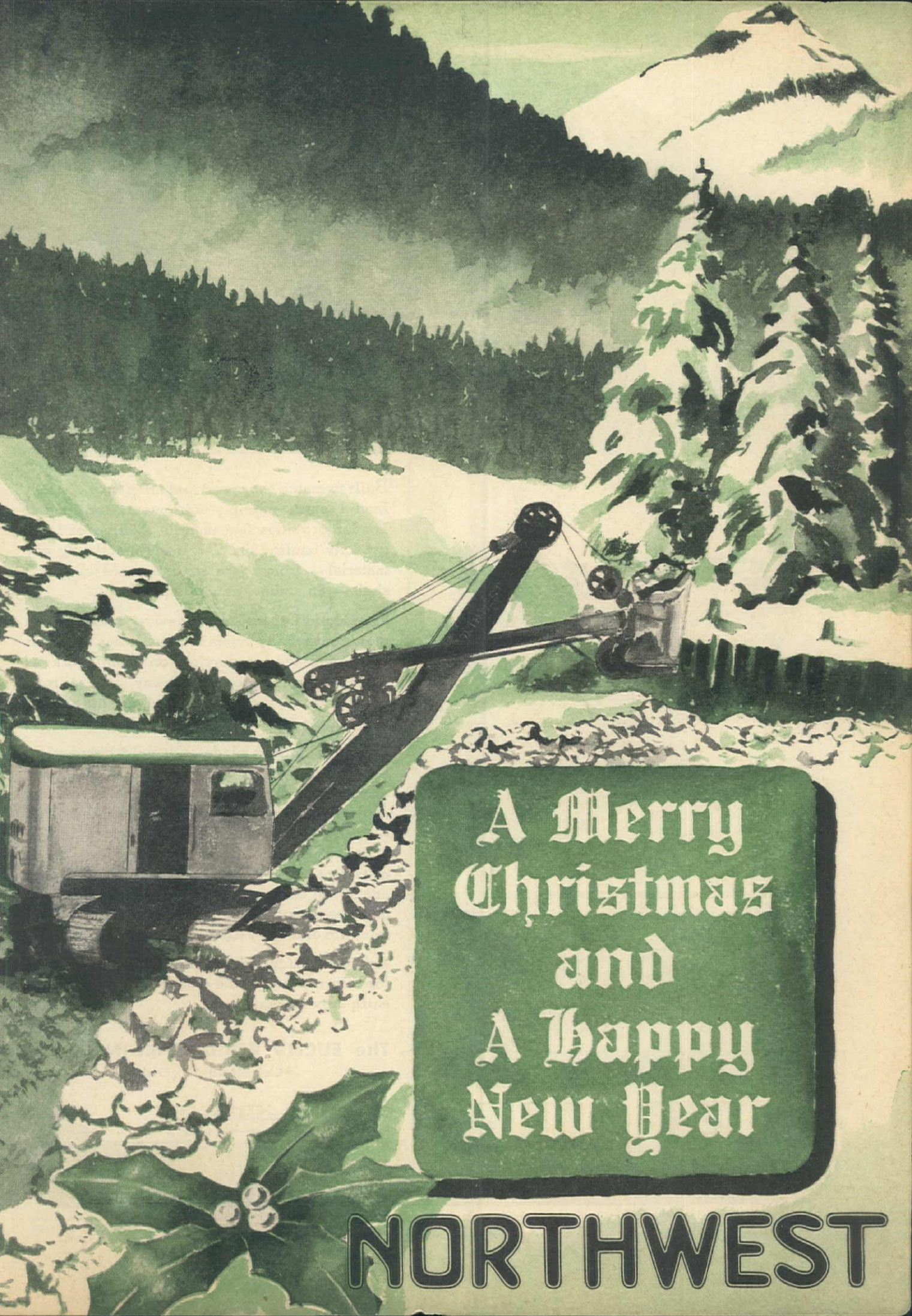
KEEP COMPRESSORS EFFICIENT

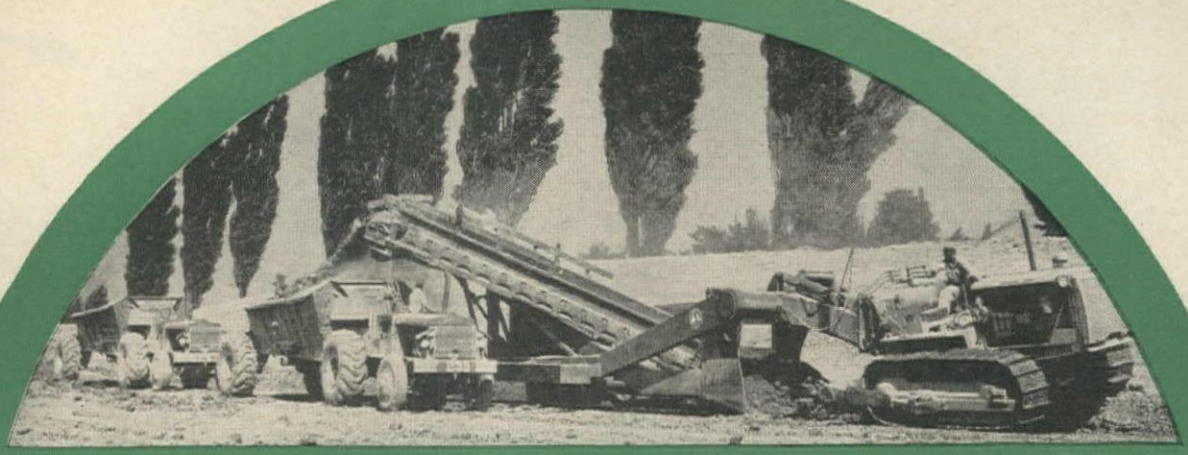
Assure clean valves, free rings, clear ports and air lines by lubricating with *Texaco Alcaid, Algol or Ursa Oil.* A Texaco Lubrication Engineer will gladly recommend the right one to assure the most efficient, economical compressor operation.

TEXACO

TEXACO Rock Drill Lubricants E. P.

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


A Merry
Christmas
and
A Happy
New Year
NORTHWEST



EUCLID LOADER MAKES THE DIRT FLY!

BIG YARDAGES AT LOW COST

Three hydraulic control levers within convenient reach of operator provide coordinated control of crawler tractor and Loader.

Built to match the speed and efficiency of other Euclid earth moving equipment, the Euclid Loader provides fast, mobile loading of large capacity hauling units. It loads practically any material — from loose sand to hard clay and shale — in a short travel distance.

The Euclid Loader has set new records for earth moving on many types of jobs. It has cut costs and increased production on such work as dams, levees, airports, highway and railroad construction, industrial plant grading, and overburden removal in strip mining.

The wide cutting blade and mold board plow send a steady flow of material to the 54″ belt driven by a diesel engine mounted at the rear of the Loader. Maximum cutting depth is 24″ — grading cuts can be made up to 9′ 6″ in width. Three control levers within easy reach of tractor operator start and stop the belt and adjust the cutting edge for angle and depth of cut. Heavy duty design and construction assure long life and big yardages at low cost.

Ask your Euclid distributor or representative for information on the complete line of Euclid earth moving equipment.

The EUCLID ROAD MACHINERY Co.
Cleveland 17, Ohio

EUCLID THE PIONEER

EUCLIDS *Move the Earth*

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

Editor
J. M. SERVER, JR.

Associate Editors
D. F. Stevens
2611 Franklin Ave., Seattle 2, Wash.
Telephone MInor 0910

Arnold Kruckman
1120 Vermont Ave., NW.,
Washington 5, D. C.
Telephone DIstrict 8822

News Editors
J. J. Timmer
K. M. Blamey

Staff Correspondents
A. E. Niederhoff
L. L. Lee
C. J. Gorman
R. E. Carter, Jr.

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Arthur F. King . . . . . President
Donald F. Forster . Exec. V.-Pres.
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V. C. Dowdle . . Production Dept.

Please address all communications to the San Francisco office

Advertising Offices

CHICAGO OFFICE
A. C. Petersen, District Manager
5833 S. Spaulding Ave., Chicago 29
Telephone PRospect 1685

SAN FRANCISCO OFFICE
R. C. Williams, District Manager
503 Market St., San Francisco 5, Calif.
Telephone YUkon 6-1537

LOS ANGELES OFFICE
J. E. Badgley, District Manager
3835 Wilshire Blvd., Los Angeles 5
Telephone FItzroy 9462

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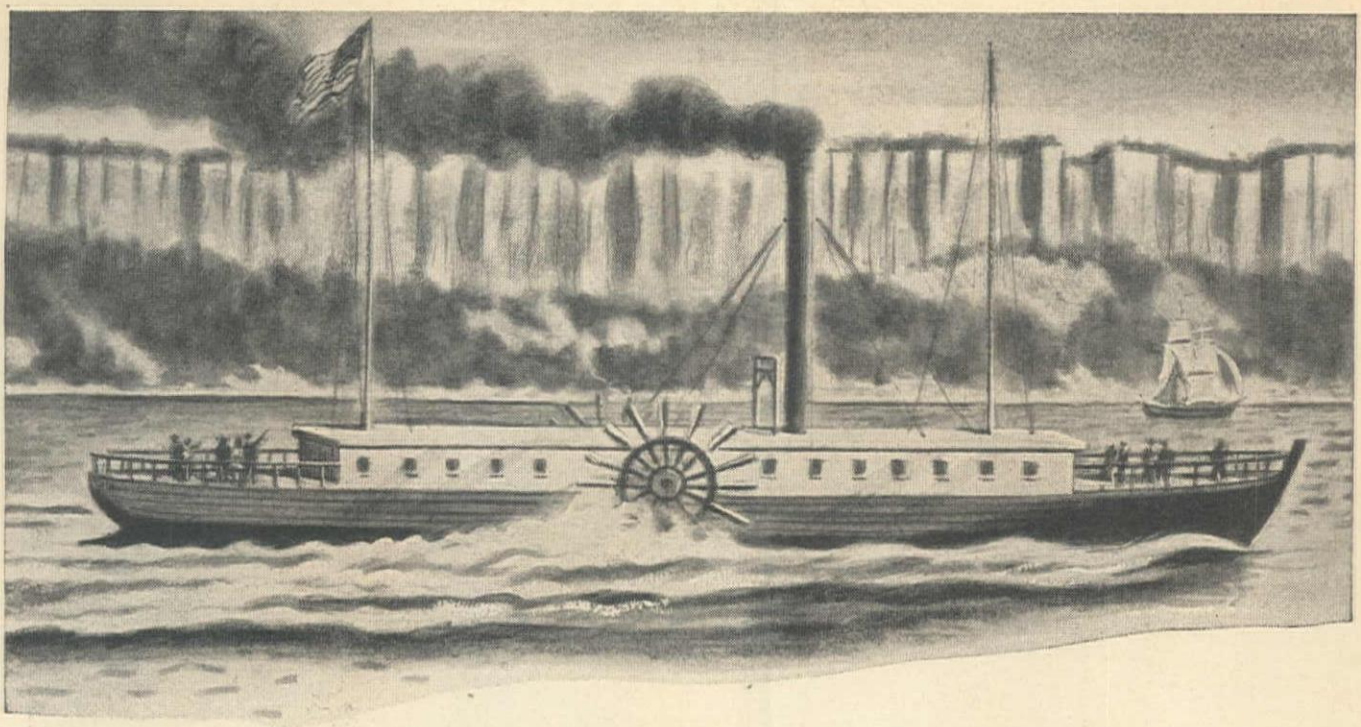
Covering the Western Half of the National Construction Field



... and they said, "She'll never turn a wheel"

Skeptics of the early 19th Century made one notably poor prophecy. "She"—the Clermont—did turn a wheel. And in short time, thousands of people were traveling in comfort by steamboat.

One of the reasons for the rapid success of important inventions such as the steamboat is that they were designed and engineered from the start for a single purpose—to do a better job.

Transite Pressure Pipe is a more recent example of the same sound principle. It too was designed and engineered from the very start for a single purpose—to do a better job.

J-M engineers combined asbestos and cement by a special process, produced a material which they called Transite. Transite Pressure Pipe is strong, rustproof, resists even the most corrosive soils . . . has a high-flow capacity which can never be reduced by tuberculation.

Then a coupling made of Transite was designed and named the Simplex Coupling. Simple and effective, it consists only of a Transite sleeve and two rubber rings tightly compressed into position between sleeve and pipe. This construction guards against leakage and also provides flexibility at each joint. The flexibility helps to cushion the entire line against shock and soil stresses, permits a deflection up to 5 degrees at each joint.

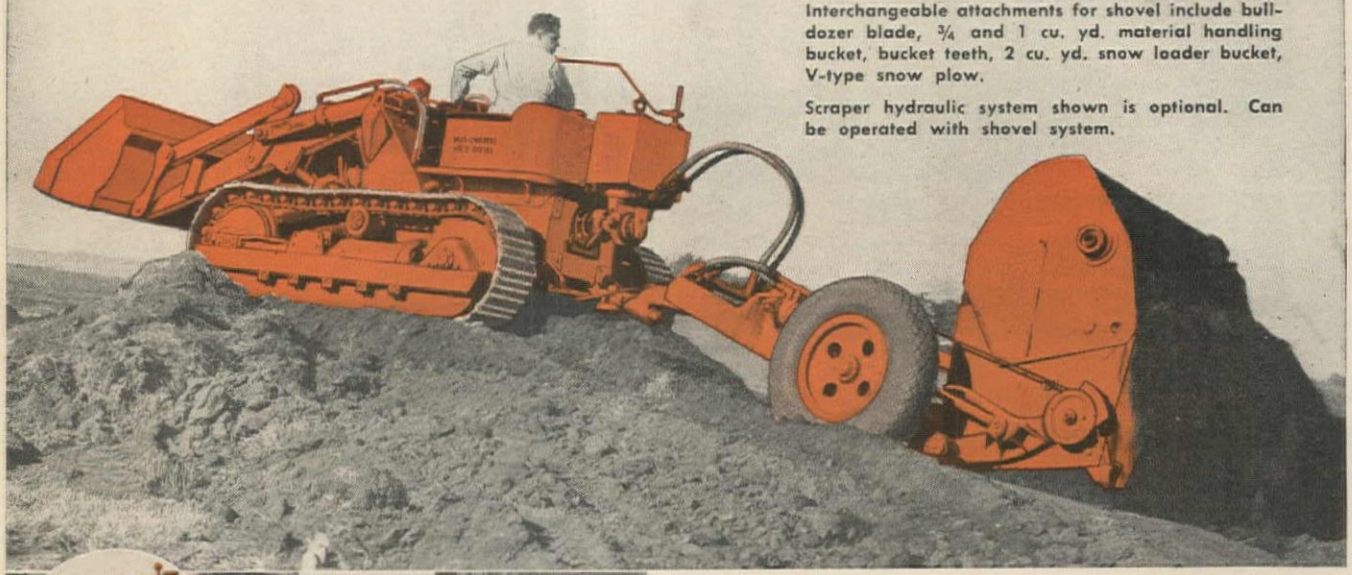
In short, the same kind of engineering foresight and planning that produced the steamboat, the automobile . . . and similar developments which have contributed to industrial progress . . . has been applied to the field of water transportation.

Transite Pressure Pipe was designed and engineered from the start for one single purpose—to carry water more efficiently.

For all the facts about Transite Pressure Pipe, write Johns-Manville, Box 290, New York 16, New York. Ask for Brochure TR-11A.

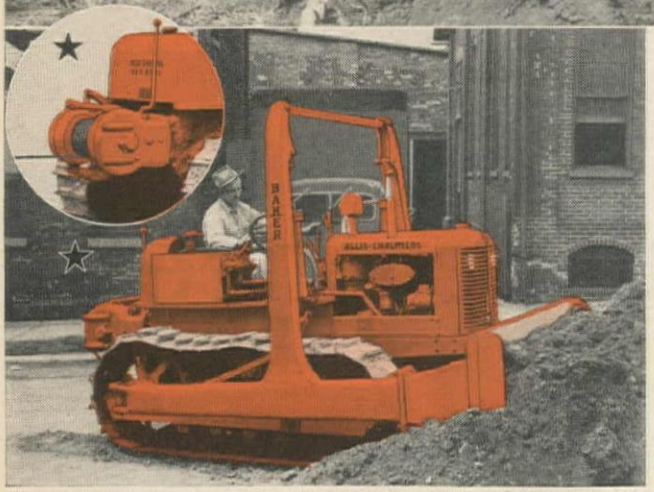
JOHNS-MANVILLE JM PRODUCTS

VERSATILE WORKER



HD-5 with Tracto-Shovel and Gar Wood scraper. Interchangeable attachments for shovel include bulldozer blade, ¾ and 1 cu. yd. material handling bucket, bucket teeth, 2 cu. yd. snow loader bucket, V-type snow plow.

Scraper hydraulic system shown is optional. Can be operated with shovel system.



HD-5 with Baker bulldozer and Carco winch combination.

(Below) HD-5 with Gar Wood scraper and bulldozer.

NEW ALLIS-CHALMERS HD-5

IS NOT JUST A DRAWBAR TRACTOR . . . NOT JUST A BULLDOZER TRACTOR . . . IT'S ENGINEERED TO WORK WITH EQUAL EFFICIENCY PULLING, PUSHING OR LIFTING!

- There's more weight — approximately 11,000 lbs. — properly distributed for better balance.
- There's extra stability and better footing with more track on the ground — 64¼" on standard, 77¼" on shovel model.
- There are larger front idlers, and both idlers and sprockets are closer to ground — means less bobbing, smoother, more accurate operation on bulldozing, snow plowing, shovel work.
- There's FULLY MATCHED auxiliary equipment — each Allied manufacturer, skilled in his own field, works in complete cooperation with Allis-Chalmers engineers in the development of HD-5 auxiliary equipment.

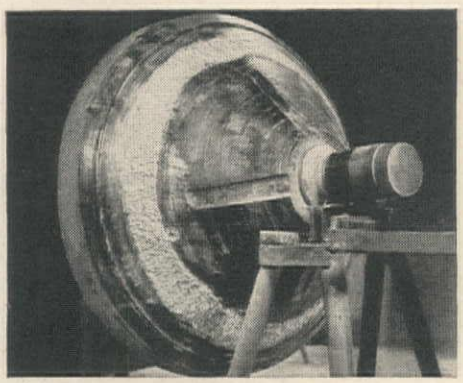
A GREAT TRACTOR WITH A GREAT ALLIED LINE!
37.5 drawbar hp. GM Diesel engine. 5 forward speeds, up to 5.47 m.p.h.; reverse 1.99 m.p.h.

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

Replacement of this $1,400 ring gear would have taken from six months to a year. The badly worn teeth were built-up by bronze-welding and the gear returned to service in just a few days at half the cost of a new one.

Keeping the "wheels" going 'round

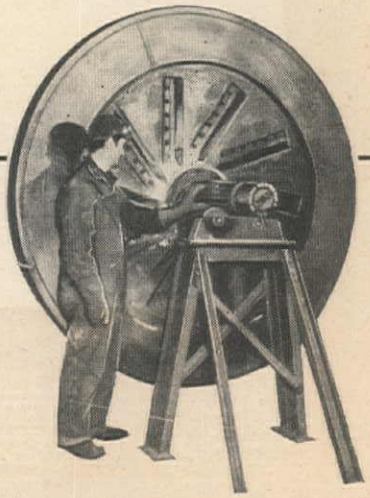
The repair of vast quantities of equipment by oxy-acetylene methods is of course routine for plant maintenance crews. It is for the special job, however, that the LINDE serviceman's supervision and work proves so valuable and gives assurance of success. This skilled, specialized assistance is always available to LINDE customers. Just phone the nearest LINDE office.



Bronze-welding this cast steel cone crusher head saved $1,000. The crack, which ran completely around the head for a distance of 9½ ft., extended through the thickness of the casting in several places. It was veed out by flame-gouging.

This cast iron steam hammer cylinder weighs 4,000 lb. Two large cracks, one on each side of the cylinder wall, were bronze-welded in only 14 hours. A new casting would have taken 16 weeks to obtain and would have cost more than 10 times as much.

Flanges are quickly joined to cast iron pipe sections by bronze-welding. LINDE supplies several bronze rods to meet varying service requirements.



Bronze-welding effected a considerable saving of cost and time when four spokes of this huge cast iron pulp-chipper wheel was cracked at the hub.

Linde

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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

In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

UNBEATABLE

EVERYTHING about the International Diesel Crawler Tractor points to just one objective: low-cost, efficient earth moving. Its Diesel engine gives you power that's balanced to the tractor's weight and construction—power that's available instantly, at the push of a button, regardless of weather! Refinements of design, developed through years of field and laboratory work, make the International Diesel Crawler your unbeatable earth mover. Each size delivers maximum effective horsepower to bulldozer or scraper blades, which means more work capacity. This is achieved through proper balance of power, pull, weight and speed. And the International gives you this fine performance at lowest operating and maintenance costs.

Get the whole story of International Diesel Crawler superiority from your International Industrial Power Distributor.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue • Chicago 1, Illinois

CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

INTERNATIONAL

EARTH MOVER

INTERNATIONAL HARVESTER

Industrial Power

New! THIS B-G HIGH

..Coordinated Equipment for Finest Bituminous Mixing Performance

The B-G Method of bituminous mixing has for years proved its superiority.

Now Barber-Greene presents more new and important time-and-cost-saving advantages in this latest B-G Central Mixing Plant equipment.

Barber-Greene engineers have developed a new, simplified drive system. Power is transmitted from a central power unit—through shafts—to the Dryer, Cold Elevator, Reciprocating Feeder, Hot Elevator and Gradation Control Unit.

4-bin Gradation Unit with 3½-deck vibrating screen provides new ease and flexibility of multiple aggregate control. Aggregate calibration and bin sampling have been simplified. Convenient hoisting device makes it easy to erect Hot Elevators and screen.

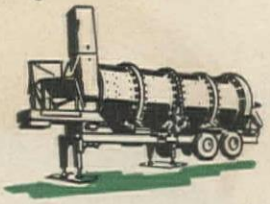
The need for pits for Hot and Cold Elevators has been eliminated.

All these—and others—are features you want, and what you'd expect of Barber-Greene, the pacesetter in better bituminous mixing.

..New PORTABILITY!

Semi-Trailer Mounting on Model 837 Dryer and Model 866 Gradation Control Unit; Model 880 Hot Elevators have removable pneumatic-tired dolly for towing; all units designed for maximum portability, flexibility, ease and speed of erection.

..New CONVENIENCE!



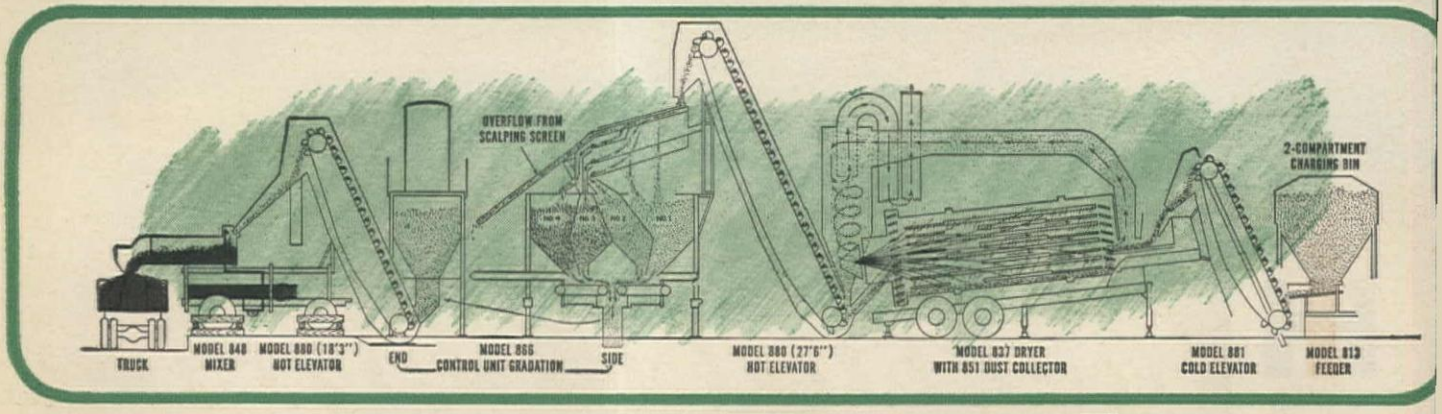
No Foundations. Adjustable jack-legs eliminate time-wasting cribbing. The 837 Dryer shown above is a single-drum, high-capacity unit with high roto-elevator discharge.

No Elevator Pits. Hot and Cold Elevators operate from ground level.

FROM 80 TO 120 TONS PER HOUR

That's what you can do with this new B-G Central Plant. Flow Chart below illustrates the B-G Continuous Flow Method: measured volumetric aggregate content, metered bitumen supply, controlled temperature and thorough twin-pugmill mixing to assure proper coating of aggregate—these are coordinated by B-G engineered equipment.

For your specific requirements, combinations of a wide variety of B-G Units and Auxiliary Equipment are available. Finding the best combination for you calls for close consultation with your B-G distributor. He can call on factory experts: together you'll get the right equipment and accessories to do the job you're figuring on.



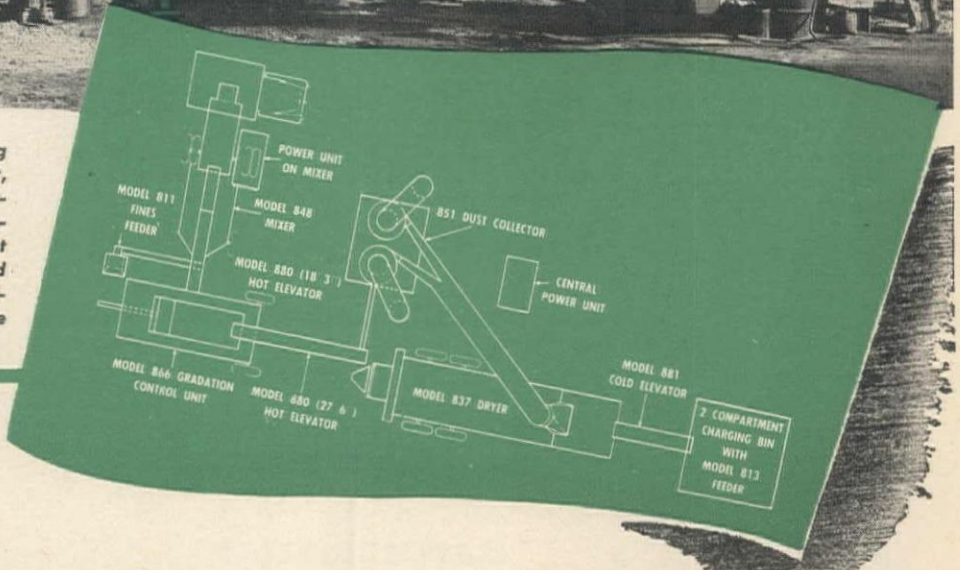
CONSTANT FLOW EQUIPMENT

Barber

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., Albuquer-

CAPACITY PLANT!

Here's a typical B-G "High-Type" Mixing Plant set-up with Gradation Control Unit, utilizing B-G Coordinated Auxiliary Equipment. For Intermediate-Mix Plant, Gradation Unit and second Hot Elevator are not needed. Dual classification of undried aggregate may be obtained with B-G adjustable 2-gate Reciprocating Feeder. Note that the B-G Method is flexible.



THESE B-G ADVANTAGES will interest You

- ***High Discharge** Dryer which eliminates Hot Elevator pit. Positive charging feeder on Dryer prevents bridging of stable mixtures.*
- ***Shaft and gear box** drives, with sealed antifriction bearings and fewer power units.*
- ***Four-bin aggregate** separation — your choice of 2, 3 or 4-aggregate gradation.*
- ***Instantaneous bin sampling** and simplified calibrating facilities.*
- ***Speedier, easier erection** and dismantling; semi-trailer mountings for greater portability.*
- ***Dual Cyclone Dust Collector** reclaims fines from Dryer exhaust gases and reduces dust nuisance.*
- ***New Fines Feeder** makes it convenient to add a measured proportion of fines.*
- *Extensive application of antifriction bearings.*
- *Lower Maintenance Costs.*
- ***Barber-Greene Experience:** broadest background in practical application of this most advanced bituminous mixing method. It is at your service—through your B-G distributor.*

See the distributor near you, or write to Barber-Greene, Aurora, Ill. for descriptive literature.

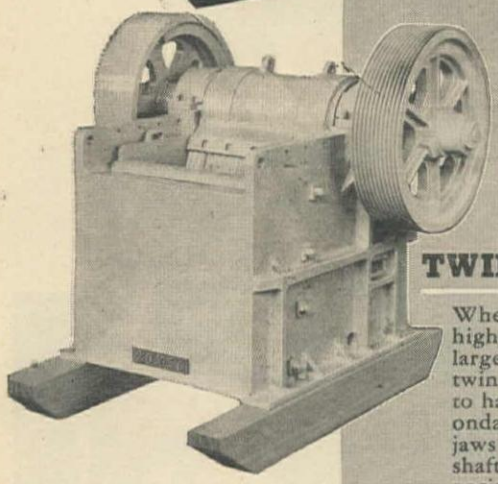
Barber-Greene

AURORA, ILLINOIS

que, New Mexico; Ray Corson Machinery Co., Denver 2, Colorado; Jenison Machy. Co., San Francisco 7, California; Western Construction Equipment Co., Billings, Montana, Missoula, Montana; Kimball Equipment Co., Salt Lake City 10, Utah; State Tractor & Equipment Co., Phoenix, Arizona.

5 RIGHT ANSWERS
...to your crushing problems!
5 CEDARAPIDS CRUSHERS

PRODUCT OF IOWA

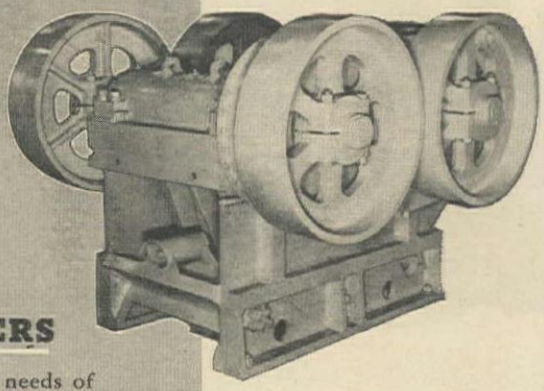


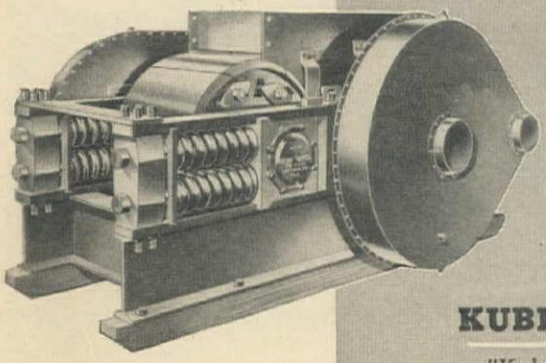
JAW CRUSHERS

Engineered in every detail for smooth, steady performance, lower maintenance and operating costs, and extra capacity. There's a complete range of sizes for primary and secondary crushing in all types of portable and stationary plants.

TWIN JAW CRUSHERS

Where there is an unusually high percentage of crushing of larger sized gravel, a Cedarapids twin jaw crusher may be used to handle the primary and secondary crushing. Two movable jaws operated by two eccentric shafts provide much greater capacity and smoother operation.



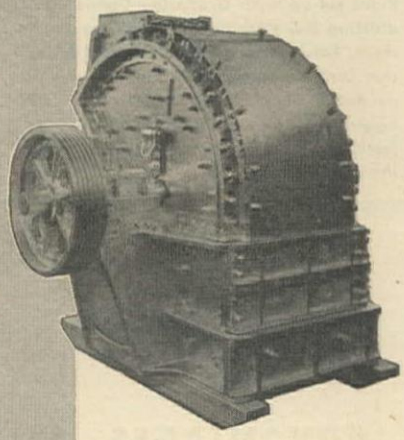


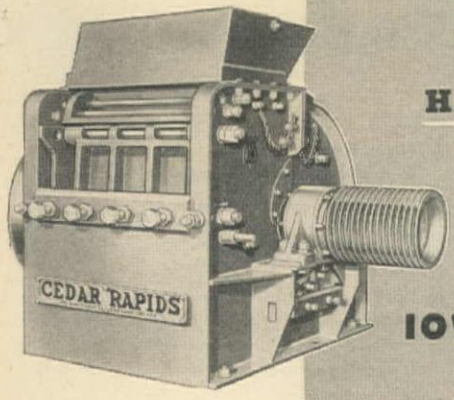
ROLL CRUSHERS

Seven sizes to fit your needs of larger production of smaller sized aggregates at lower cost. Available with two smooth, or two corrugated roll shells or with one of each depending upon finished product desired. Exclusive shear plate protection for shaft and bearings.

KUBIT IMPACT BREAKER

"Kubitized" aggregate with its uniformly angular surfaces, makes much stronger concrete, bituminous, or macadam construction. Hammers mounted on a rotor knock the stone against breaker bars breaking the stone along its natural lines of cleavage. Available in 4 sizes.





HAMMERMILLS

Cedarapids Hammermills will produce either crushed limestone up to 1½" size or agricultural lime, or a percentage of both, depending upon the setting of the grates and the speed of the rotor. Offered in 3 sizes, and in complete portable combinations as well.

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA

Cedarapids — Built by IOWA

The Iowa Line *of Material Handling Equipment is distributed by:*

For details on Cedarapids crushers, ask for Bulletin CC-1 or see your nearest Cedarapids dealer.

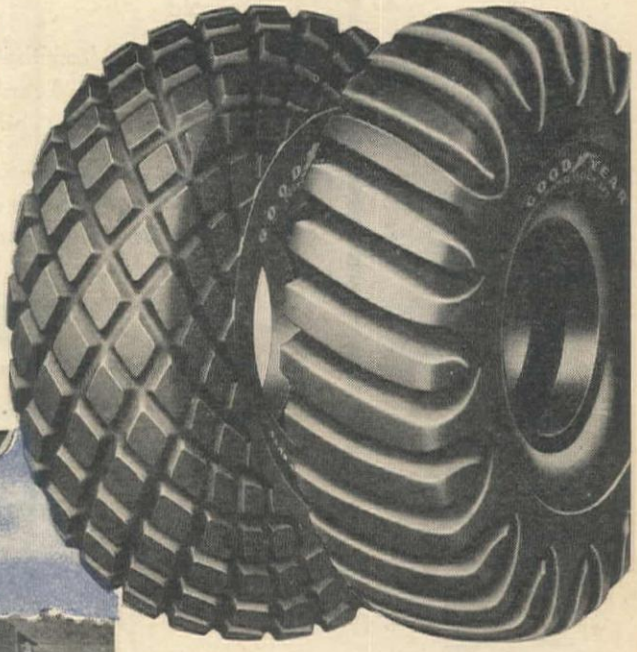
HOWARD-COOPER CORP., Seattle, Washington, Portland, Eugene and Central Point, Oregon; HALL-PERRY MACHINERY CO., Butte, Great Falls, Missoula, and Billings, Montana; INTERMOUNTAIN EQUIPMENT CO., Boise and Pocatello, Idaho, and Spokane, Washington; WORTHAM MACHINERY CO., Cheyenne, Wyoming; KIMBALL EQUIPMENT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

PULL to bull-through any going!

YARDAGES move *on schedule* at lower cost with this tire on your drive wheels. It's Goodyear's great Sure-Grip — "right" on the job because it's packed with pull, and tough as they come. That *open center* self-cleaning tread makes each lug bar a *separate* traction cleat that digs in deep, takes firm grip with minimum slip, pulls sure and steady in tough going.

No wonder the Sure-Grip is *first choice* wherever pulling power is the top need! And when you add in the low-cost, long-life performance typical of *all* job-proved Goodyear work tires, you see why Goodyears *stay* first choice — why, year after year, *more yards are moved on Goodyear off-the-road tires than on any other kind!*

A right tire for each job



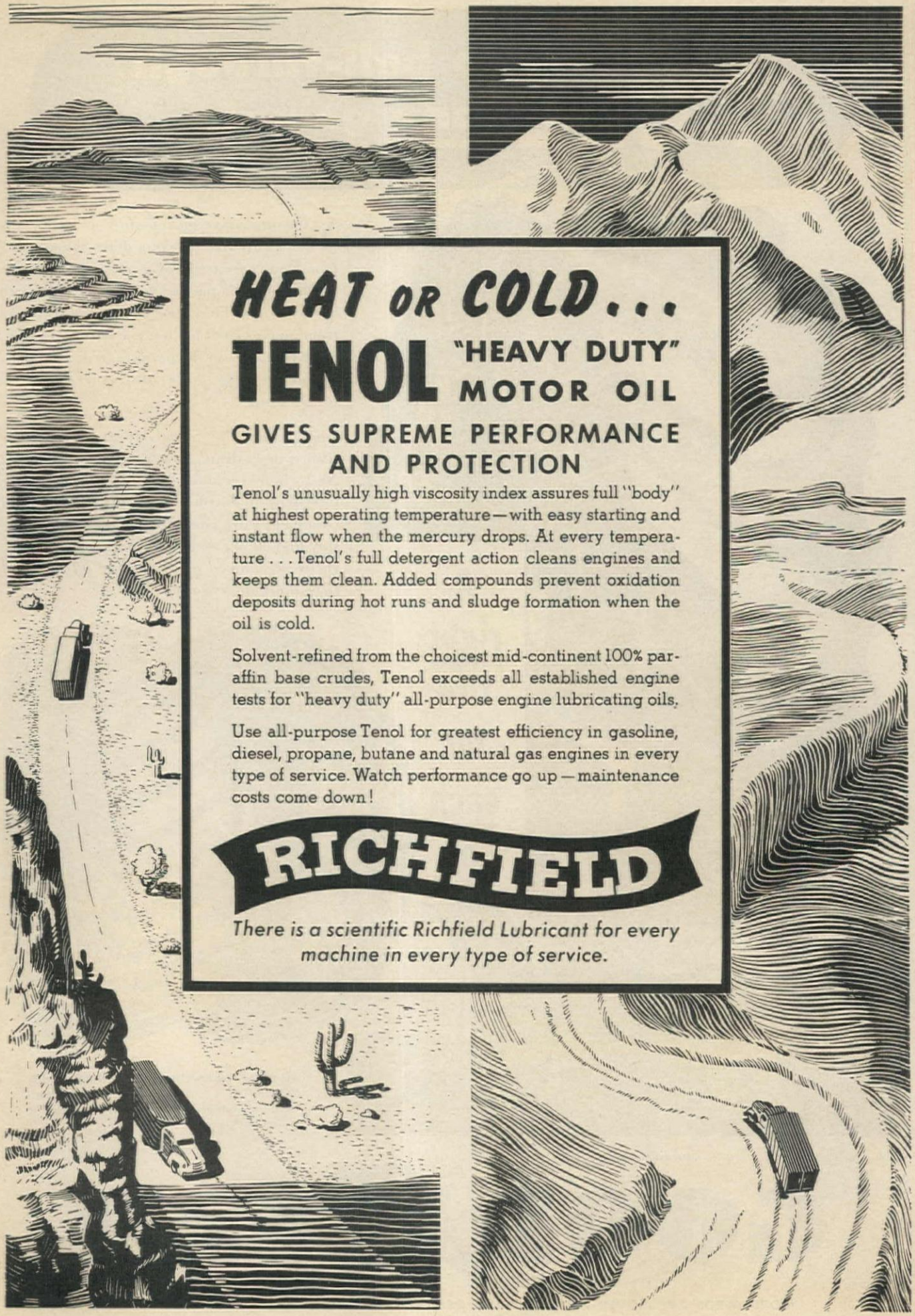
ALL-WEATHER EARTH MOVER
for drawn vehicles and general traction

HARD ROCK LUG
for super stamina in all rock work

Sure-Grip, All-Weather—T.M.'s The Goodyear Tire & Rubber Company

GOODYEAR

MORE YARDS ARE MOVED ON GOODYEAR OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND



HEAT OR COLD...

TENOL "HEAVY DUTY" MOTOR OIL

GIVES SUPREME PERFORMANCE AND PROTECTION

Tenol's unusually high viscosity index assures full "body" at highest operating temperature—with easy starting and instant flow when the mercury drops. At every temperature . . . Tenol's full detergent action cleans engines and keeps them clean. Added compounds prevent oxidation deposits during hot runs and sludge formation when the oil is cold.

Solvent-refined from the choicest mid-continent 100% paraffin base crudes, Tenol exceeds all established engine tests for "heavy duty" all-purpose engine lubricating oils.

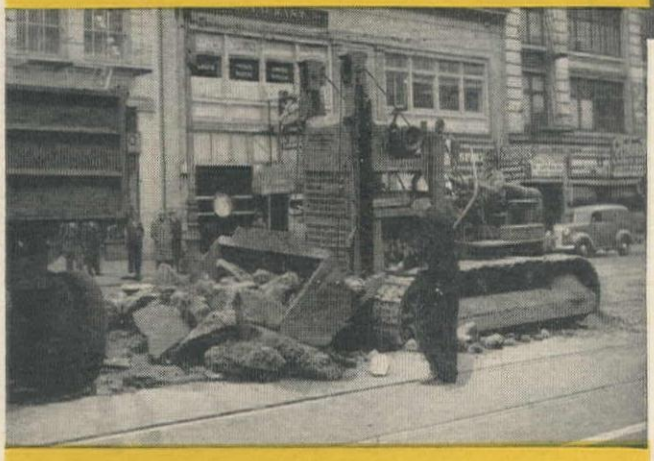
Use all-purpose Tenol for greatest efficiency in gasoline, diesel, propane, butane and natural gas engines in every type of service. Watch performance go up—maintenance costs come down!

RICHFIELD

There is a scientific Richfield Lubricant for every machine in every type of service.

IMAGINATION AND "CATERPILLAR" POWER DO THE JOB IN RECORD TIME

A "Caterpillar" Diesel D8 with Hyster arch makes an ideal tool for rail removal, lifting one 62-foot section at a time.



Loading trucks with broken concrete, a "Caterpillar" Diesel D7 and Traxcavator work fast without disturbing traffic.

When the firm of Charles L. Harney took on the contract for removing and replacing streetcar rails on San Francisco's famous Market Street, the time limit set was 300 days. By the ingenious use of equipment never before tried on city streets, the job was completed 187 days ahead of schedule!

Harold W. Purser, Superintendent, makes the following statement:

"Our Market Street job has been 100% 'Caterpillar' powered, and all machines have operated 100% of the working time. Not one minute has 'Caterpillar' Diesel power let us down on this tight-scheduled job."

The line-up of equipment that handled the unusual contract so efficiently included a "Caterpillar" Diesel D13000 Engine, powering the compressor used on air drills and tampers; a "Caterpillar" Diesel D8 Tractor with Hyster logging arch that tore up the old rails; and a "Caterpillar" Diesel D7 Tractor with Traxcavator, for loading broken pavement into trucks.

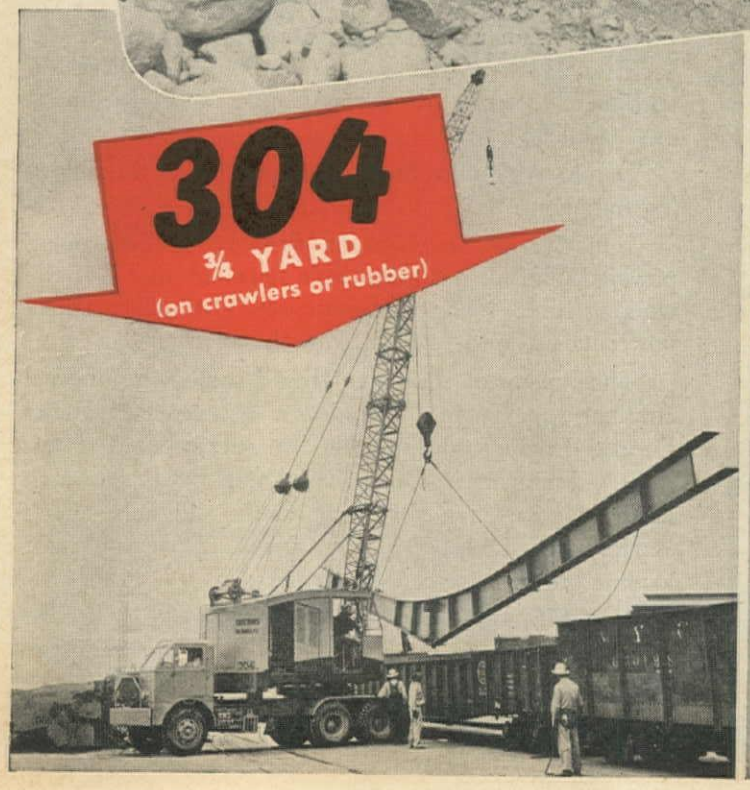
Versatile and dependable, backed by dealer service that has won wide fame as the finest in the industry, "Caterpillar" Diesels are built to tackle the toughest jobs and return a profit to their owners.

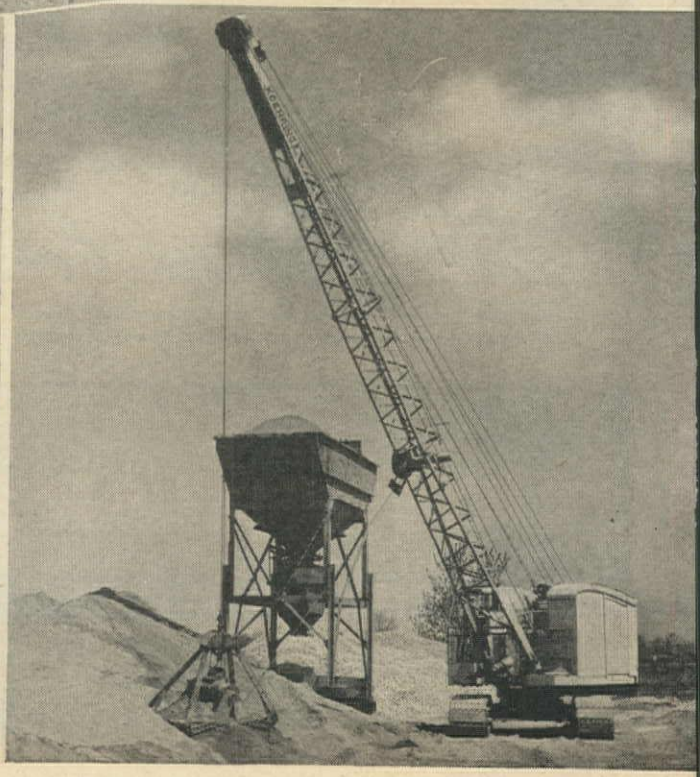
CATERPILLAR TRACTOR CO., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR
REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

MORE HOURS per shift with KOEHRING





MORE PROFITS per year

HEAVY-DUTY excavators

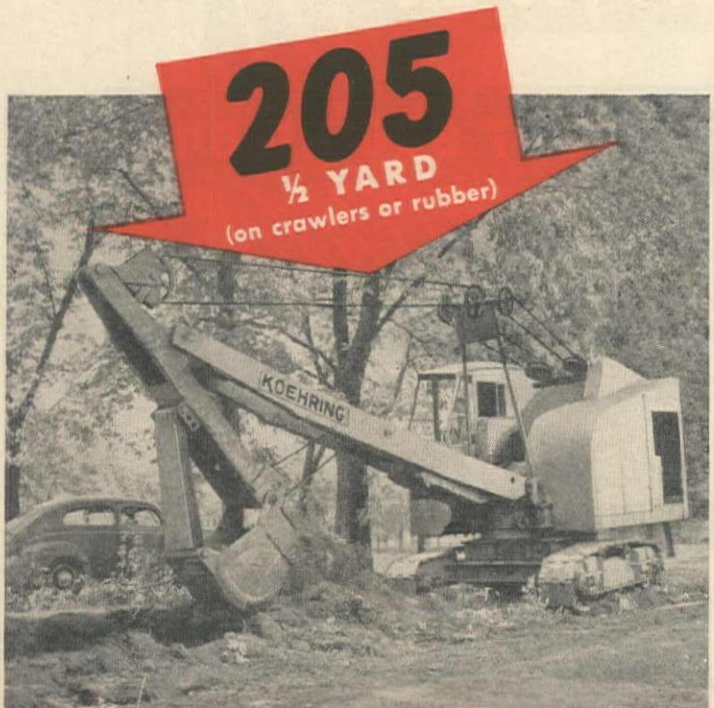
YOU get steady performance, cut maintenance delays and expense, save plant schedule readjustments, insure customer satisfaction, by using Koehring HEAVY-DUTY excavators. They are tough, long lived, built simple and handy to encourage good operator care and preventative maintenance. See your Koehring Distributor before you buy.

The Koehring 605, 1½ yard as shovel, is big and strong, ideal for rock excavation, with its heavy-duty shock absorber mounted shovel-boom. Mounted on Koehring self-cleaning crawlers, available in various sizes. Koehring 605 Cranes are equipped with a high A-frame which can be lowered or raised by power. The 605 is easily converted from shovel to crane, or dragline.

The Koehring 304, ¾ yard as shovel, with high operating speed and Koehring construction, gives you durability and increased production. You can get the Koehring 304 either crawler-mounted, or rubber-mounted as Cruiser Crane or truck crane for greater mobility. Front ends on crawler and truck models can be quickly and easily changed for shovel, pull shovel, dragline, or crane operations.

The Koehring 205, ½ yard as a shovel, features independent traction for greater speed and mobility and a 2 in 1 shovel boom for both shovel and pull shovel work. Heavy-duty construction, ease of operation, speed and maneuverability of the 205 gives you a money-making excavator. The 205 is available mounted on rubber or crawlers and is easily converted to shovel, pull-shovel, crane or dragline.

Write for FREE catalog



Pacific Hoist & Derrick Co.
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Harron, Rickard & McCone Co.
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Neil B. McGinnis Co.
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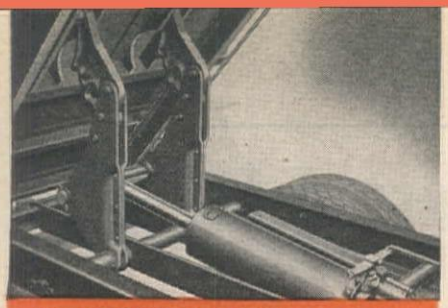
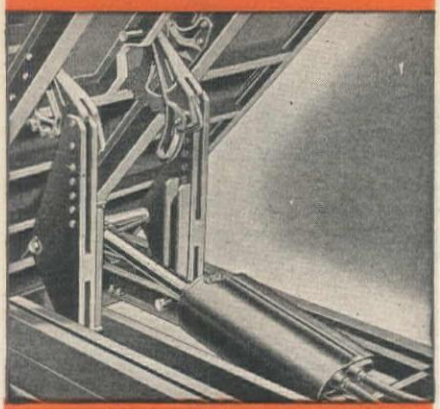
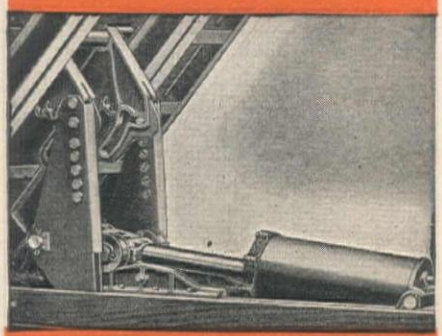


GALION MODEL GH-56
for 5 ton capacities



GALION MODEL GH-58
for 12 ton payloads



GALION MODEL GH-60
easily handles 25 tons

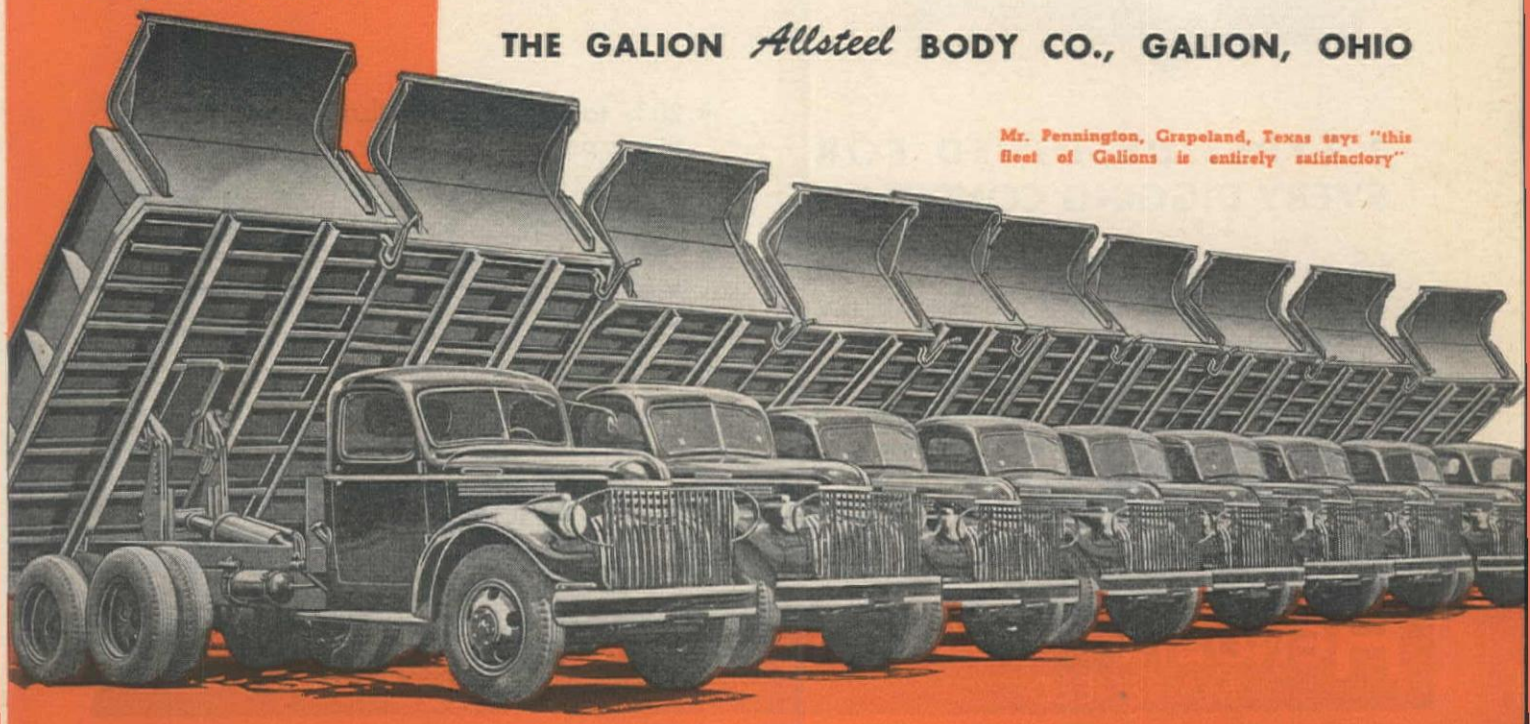
GALION *Allsteel*

HYDRAULIC HOISTS and BODIES Have Established An Enviable Record With Fleet Owners Everywhere

The versatile Galion hoist and body combination has proved its superiority on thousands of fleet installations from coast to coast. Both owners and operators report their Galions always give years of trouble free service – and their trucks are used on some of the toughest material handling jobs in the country!

Galion heavy duty construction features assure longer dump truck life and the precision made, oversize hoist assemblies bristle with strength and extra power. Rugged, reinforced allsteel bodies handle maximum loads of all materials. Follow experience-wise fleet operators by specifying Galions – they outlast the chassis every time.

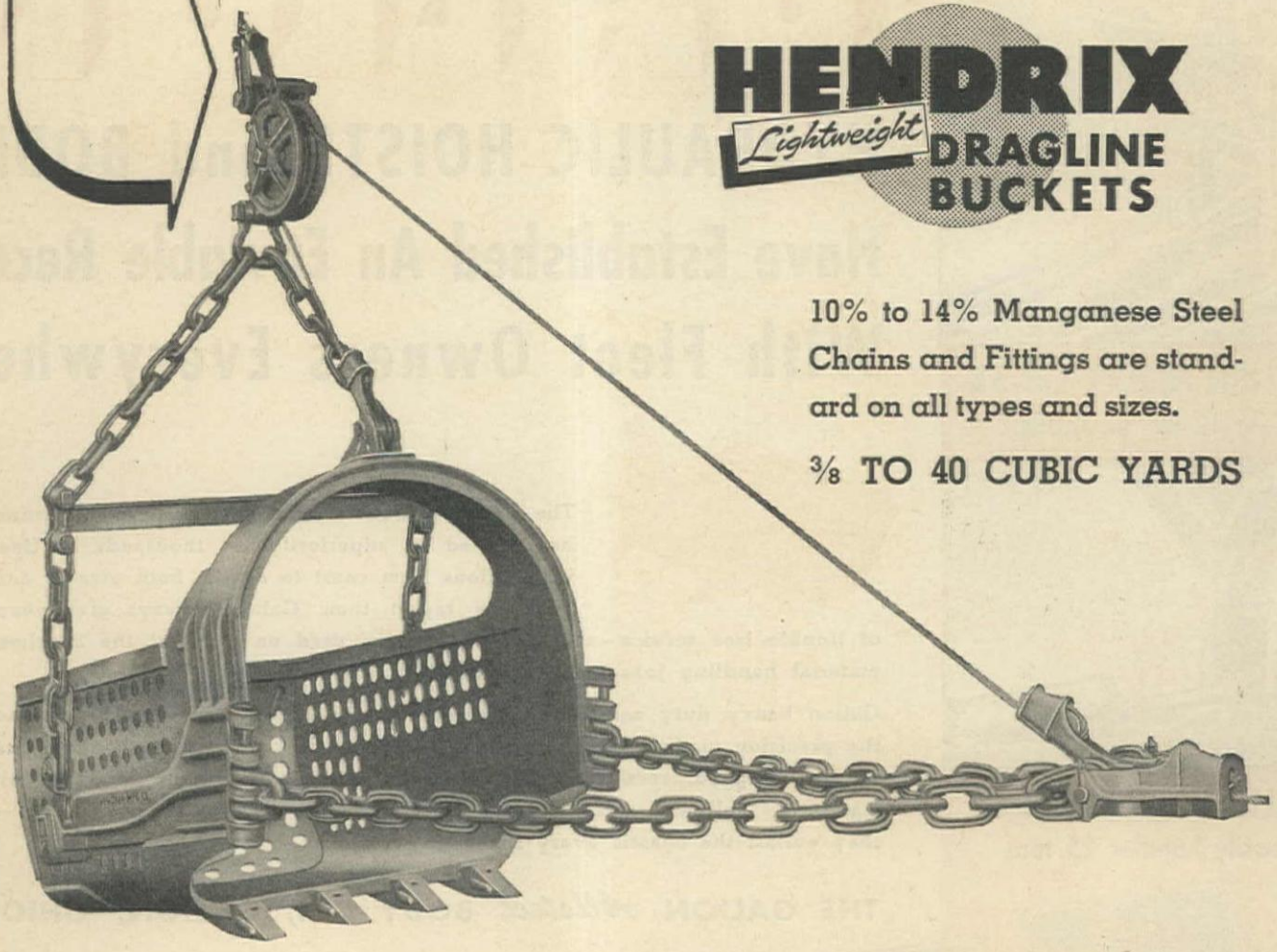
THE GALION *Allsteel* BODY CO., GALION, OHIO



Mr. Pennington, Grapeland, Texas says "this fleet of Galions is entirely satisfactory"

GALION EQUIPPED FLEETS ARE ALWAYS ON THE JOB!

EVERYTHING THAT COULD BE ASKED FOR IN A 3/8 TO 40 CUBIC YARD BUCKET



HENDRIX *Lightweight* DRAGLINE BUCKETS

10% to 14% Manganese Steel Chains and Fittings are standard on all types and sizes.

3/8 TO 40 CUBIC YARDS

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.

WITH OR WITHOUT PERFORATIONS

WRITE FOR DESCRIPTIVE LITERATURE OR ASK YOUR DEALER

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MANSFIELD INCORPORATED LOUISIANA

JUST AS TOUGH AS THEIR BIG BROTHERS

You'll find Worthington Accessories as worthy of the Blue Brute name as the Rock Drills, Air Tools, Compressors and other "big shots" in this famous line. Air Hose, Paving Breaker Moil Points and Chisel Bits — Rock Drill Steel and Bits — Line Oilers, Valves, Couplings, etc. — all made to Blue Brute standards and thoroughly tested for the job to be done.

Save time, labor and money. Make sure you're equipped with genuine Blue Brute accessories for all mining or construction work. Rugged, hard working, always dependable, they'll quickly prove to you that *there's more worth in a Blue Brute.*

H7-8

BUY BLUE BRUTES

KNOW YOUR

BLUE BRUTES

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

RANSOME EQUIPMENT

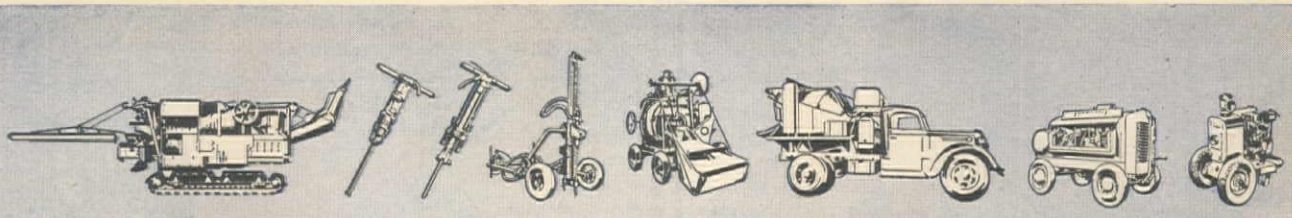
Pavers, Portable and Stationary Mixers, Truck Mixers, Pneumatic Placing and Grouting Equipment and Accessories.

WORTHINGTON EQUIPMENT

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

WORTHINGTON

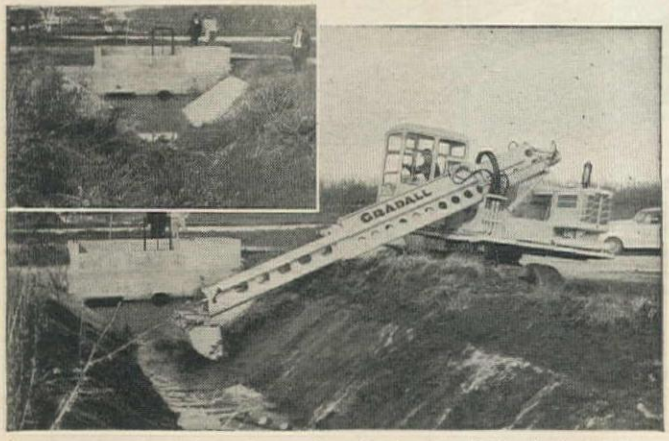
Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division, Holyoke, Mass.



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

IMAGINE TACKLING THESE JOBS WITH ANY MACHINE OTHER THAN A GRADALL

Low head room and numerous pillars and bases only 20 feet apart made excavating for a sub-basement in a complete building a tricky job. Gradall fitted perfectly on this job, eliminated need for costly manual labor.



Small inset photo shows how miles of irrigation ditches looked before Gradall went to work. Customarily a hand labor job to avoid damaging concrete linings, it took one man a day to clean 75 linear feet. Gradall cleaned 2000 linear feet a day—did it cleaner, better in every way. (See photo)

Cleaning cinders between and outside track is usually a manual job to avoid damage to ties, rods, tie plates, etc. The amazing dexterity and precision of Gradall now permit this job to be done by machine.

Gradall is ideal for ripping up old pavement. Its accuracy protects trees, poles, tree lawn and curb—leaves a clean, level surface that saves time in re-surfacing.

● Any practical construction man recognizes the difficulties involved in the several jobs illustrated.

This picture story graphically proves Gradall's versatility—shows how Gradall's hydraulic "Arm Action" can do so many construction jobs better—at lower cost.

Tools for different jobs are interchangeable at the end of the boom—changes can be made in less than 15 minutes.

Mounted on heavy-duty chassis, Gradall gets from job to job at truck speed.

Better than a photographic story is an actual demonstration. Your nearest Gradall distributor can arrange it.

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Los Angeles 32, California

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

For further information about Gradall and its many money-saving advantages, see a Gradall distributor or write . . .

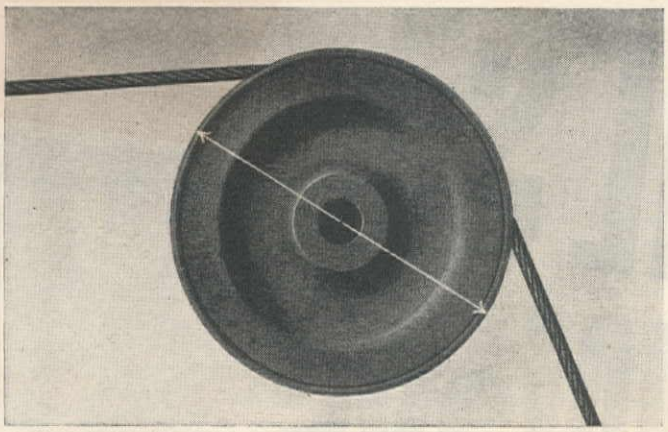
GRADALL DIVISION
WARNER & SWASEY
Cleveland

Gradall Reg. U. S. Pat. Off.

A Columbia wear-saving tip

How to select sheaves

Sheave diameters — and drum diameters, too — should be large enough to keep wearing stresses out of the rope as it passes over the sheave. Exactly how large a tread diameter should be depends on service conditions, loads, speed, etc. However, recommended tread diameters below will generally give best service and prolong the life even of Preformed American TIGER BRAND which is known for its high resistance to bending fatigue and wear.

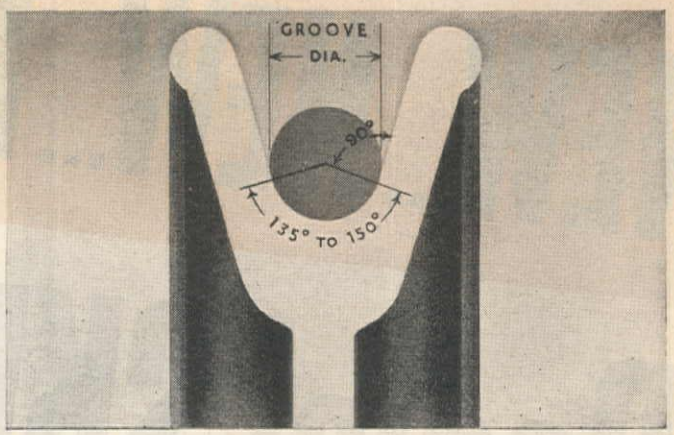


Recommended Tread Diameters

Type of Wire Rope	Drums and Sheaves
6 x 7	72 times rope diameter
6 x 19 Seale Patent	51 times rope diameter
6 x 21 Type M	45 times rope diameter
6 x 19 Type N	39 times rope diameter
8 x 19 Seale Patent	39 times rope diameter
8 x 19 Type N	31 times rope diameter
6 x 37 Type S	27 times rope diameter

On any job...any equipment...American TIGER BRAND Wire Rope stands up under toughest usage. It's produced here in the West by Columbia under United States Steel's exacting specifications. Available preformed and non-preformed. Some users pick preformed TIGER BRAND for its ability to resist bending fatigue...because each wire carries its share of the load...because it handles easily, resists whipping, runs smooth and true in the groove.

Get in touch with your dealer...see for yourself why TIGER BRAND has a national record for performance. And for more complete information on how to rig with best results, consult the Columbia Steel Company office nearest you.



Diameter Tolerances for Grooves

Sheave grooves should be slightly larger than the rope to avoid pinching and binding. It should be remembered, too, that as a sheave wears the groove wears *smaller*...not larger.

Nominal Rope Diameter in Inches	Groove Diameter Should Exceed Nominal Rope Diameter by:— (Inches)	
	Minimum	New or Remachined Grooves
$\frac{1}{4}$ to $\frac{5}{16}$	$\frac{1}{64}$	$\frac{1}{32}$
$\frac{3}{8}$ to $\frac{3}{4}$	$\frac{1}{32}$	$\frac{1}{16}$
$\frac{13}{16}$ to $1\frac{1}{8}$	$\frac{3}{64}$	$\frac{3}{32}$
$1\frac{3}{16}$ to $1\frac{1}{2}$	$\frac{1}{16}$	$\frac{1}{8}$
$1\frac{9}{16}$ to $2\frac{1}{4}$	$\frac{3}{32}$	$\frac{5}{32}$
$2\frac{5}{16}$ and Larger	$\frac{1}{8}$	$\frac{3}{16}$

Keep an extra line on hand and be sure it's TIGER BRAND

COLUMBIA STEEL COMPANY
San Francisco • Los Angeles • Portland
Seattle • Salt Lake City

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
United States Steel Export Company, New York

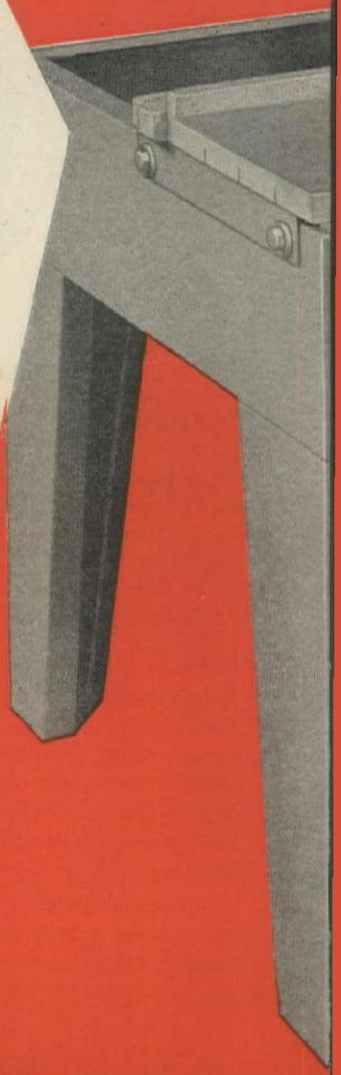
UNITED STATES STEEL

1 Smooth operating, new type retractable arm . . . strong, rigid, unbelievably light in weight and easy to operate all day.

2 All work is plainly visible at all times . . . no obstructions in the line of vision. It's easy to see every cut as it's being made.

NEW... NEW... NEW

Radial SKIL* Saw Better 12 Ways



3 Accuracy to within 1/100 of an inch for the life of the machine gives you "picture frame" precision on every cut you make.

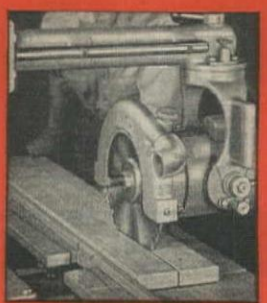
4 Double-row adjustable load carrying bearings on heat-treated, precision ground steel rails for constant alignment of arm.

5 All adjustments can be easily reached from the working position . . . no hide-and-seek for measurements or blade angle.

6 Finger-tip pressure is all you need . . . the saw does its work with a minimum of effort on newly designed retractable arm.

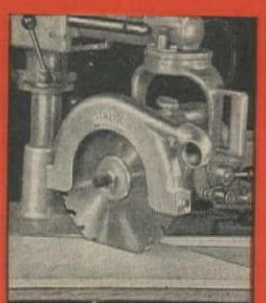
Cross-cut

Bevel Cross-cut



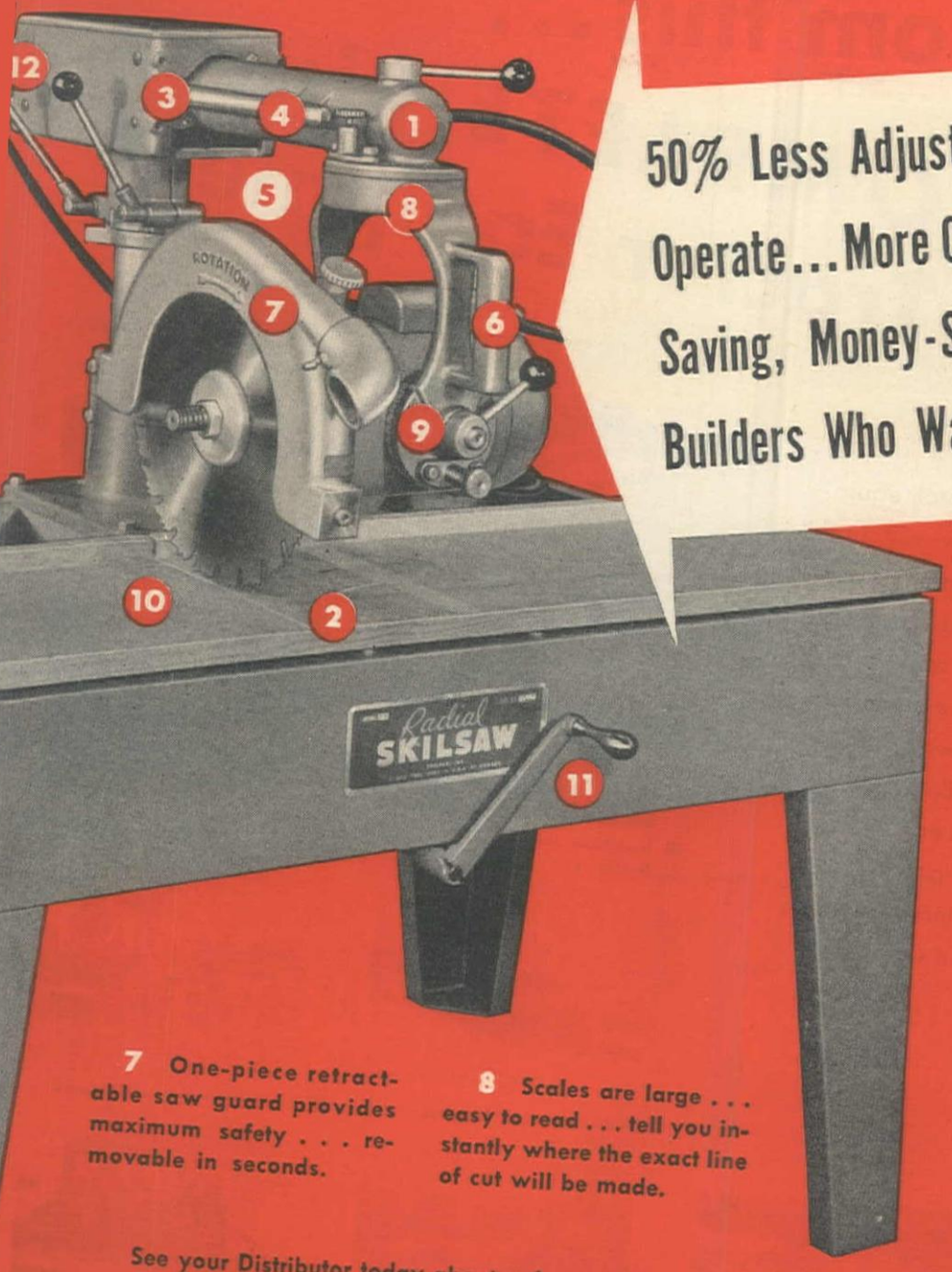
Rip

Bevel Rip



Miter

50% Less Adjusting Time... Easier to Operate... More Cuts per Day... 12 Time-Saving, Money-Saving Features... for Builders Who Want to Cut Their Costs



7 One-piece retractable saw guard provides maximum safety . . . removable in seconds.

8 Scales are large . . . easy to read . . . tell you instantly where the exact line of cut will be made.

9 Sturdy construction for years of hard use. Typical SKIL Tool quality throughout.

10 Plenty of room to set up jobs . . . with sawing head fully retracted it's easy to position the material to be cut.

11 Retractable elevator handle for quick, accurate adjustments on depth of cut . . . one full turn raises or lowers blade exactly ⅛ inch . . . half turn, 1/16 inch and so on.

12 Felt wicks keep rails free of dust and dirt at all times . . . a refinement that keeps Radial SKIL Saw working better... longer.

● 14 inch, 1½ and 2 h.p. models with maximum cut-off capacity 3⅛" x 14" . . . 16 inch, 3 and 5 h.p. models with maximum cut-off capacity 4⅛" x 13½".

See your Distributor today about a demonstration.

ELECTRIC PNEUMATIC
SKILTOOLS

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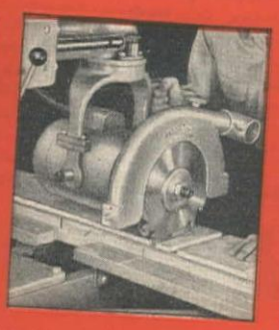
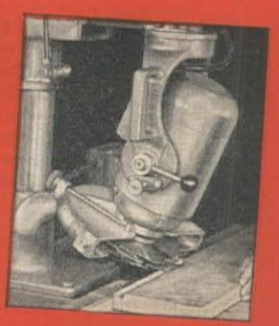
*SKIL Saw is made only by SKILSAW, INC.


Bevel Miter


Dado


Plough


Rabbet


Bevel Rabbet

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COMPLETE Line of BUCYRUS ERIE Tractor Equipment

No matter what tractor equipment you need, you will find just the right units in the *complete* Bucyrus-Erie line. Every one gives you the same well-balanced design, the same excellent, low-cost performance that characterizes Bucyrus-Erie equipment—each is engineered to utilize the full power and efficiency of your International tractor. Bucyrus-Erie Co., South Milwaukee, Wis.

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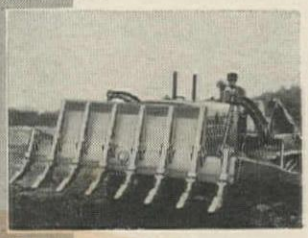
● Hydraulic and Cable Bullgraders

● Hydraulic and Cable Bulldozers

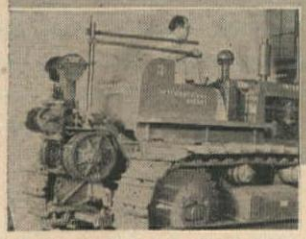


● Hydraulic and Cable Grubbers

● DOZER-SHOVELS

● 4-Wheel Cable Scrapers

● 2-Wheel Hydraulic Scrapers



● Planetary Power Control Winches

● Cable Rippers

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Perfect Partners

FOR LOW-COST ROAD WORK

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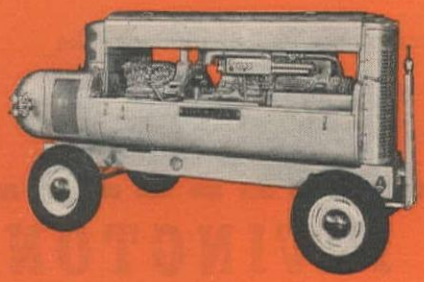
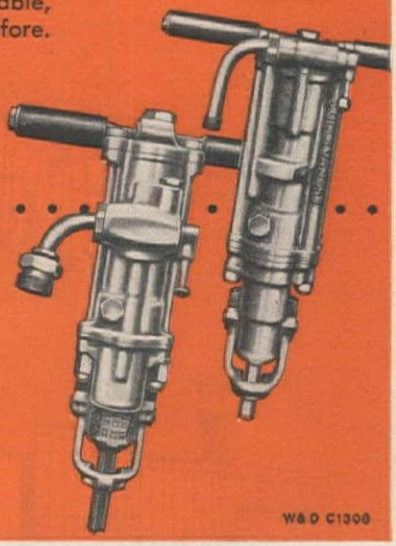
630 c. f. m.



SERIES 80 AIR COMPRESSORS
from 68 to 630 c. f. m.

Two stage, air cooled compressed air plants—gasoline or diesel driven—with size and weight kept to a minimum to make them really portable, yet delivering air more efficiently than ever before.

Econo-Miser Load Control regulates air supply to meet the demand of the job.



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JOY SILVER STREAK
Cadmium Plated Rock Drills

Cadmium plating not only protects your Sullivan drills from rusting, but, the lubricating properties of cadmium prevents scoring should lubrication temporarily fail.

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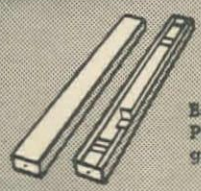
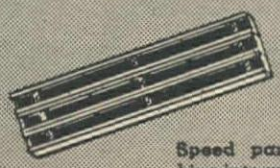
THE A. B. C. of ATLAS *Savings*



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

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



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

Forms are quickly and easily positioned for floors.

Light and sturdy. Easy wall assembly. Rapid stripping.

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

Cut YOUR ESTIMATE FOR FORM COSTS AND LABOR IN *Half*

if you are going to use ATLAS FORMS

IF the job involves poured concrete, check with Irvington. Remember this:

In poured concrete construction, form costs are 60% of the total costs. And in the average job, the following statement holds true:

ATLAS SPEED FORMS reduce the cost of forms 50%! They reduce the cost of form labor 50%! They cut the time 50%!

If you send us a copy of your plans, we'll be glad to make a layout and estimate. We'll return your plans in three days if you wish. Please use the coupon.

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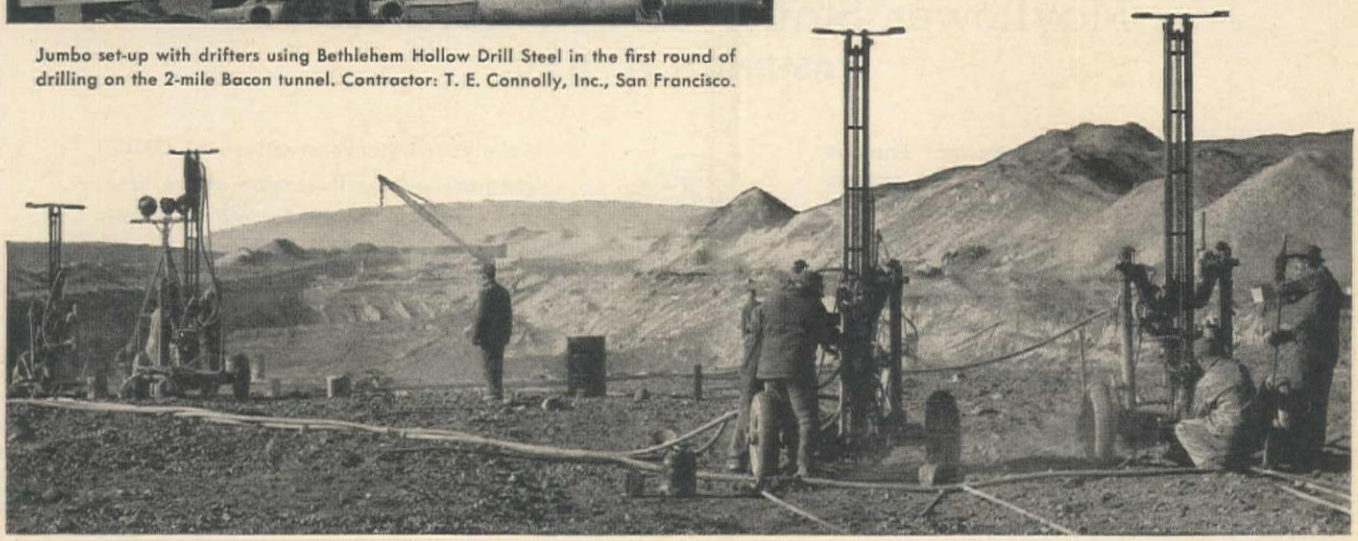
Burrowing through Basalt

TO IRRIGATE A MILLION ACRES

Wagon drills fitted with Bethlehem Hollow Drill Steel biting into basalt rock on the West Canal. Contractors: Utah Construction Co., San Francisco, and Winston Bros., Los Angeles.

Jumbo set-up with drifters using Bethlehem Hollow Drill Steel in the first round of drilling on the 2-mile Bacon tunnel. Contractor: T. E. Connolly, Inc., San Francisco.



When completed, the tunnels, canals and siphons of the Columbia Basin Irrigation Project will carry Grand Coulee water to 1,029,000 arid acres in southeastern Washington. Hundreds of miles of these man-made waterways will help develop lush farmlands where nothing but sagebrush now grows.

The progress made by many of the contractors on this job is speeded by their use of modern wagon drills, jackhammers and drifters equipped with Bethlehem Hollow Drill Steel. This tough, fatigue-resisting steel is boring steadily through basalt and granite day by day. It is used here with both detachable and forged-on bits, each method giving excellent service.

Bethlehem Hollow Drill Steel has 4 features of importance. It has a true round, smooth hole . . . it forms a tough shank . . . it is uniform in size . . . it has a wide quenching range.

Consider these features when you're ready to order your next drill steel, and remember there's no better steel made for hard-rock drilling than Bethlehem Hollow.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

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

BETHLEHEM PACIFIC

★ BETHLEHEM STEEL ★

American Road Builders' Association

announces

TWO IMPORTANT MEETINGS IN 1948

HIGHWAY CONFERENCE

JANUARY 26-28

Mayflower, Statler and Willard Hotels

WASHINGTON, D. C.

An interesting 3-day program! Famous speakers, conferences, forums, reports of technical committees, business sessions, induction of new officers. The capital at the height of the season!

Make your hotel reservations AT ONCE! Congress will be in session at the time. Write, wire or phone for official application blanks today.

1948 ROAD SHOW

SOLDIER FIELD

and

45th Annual ARBA Convention

JULY 16-24

CHICAGO

The 1948 ROAD SHOW will be the largest exposition of equipment, machinery and materials used in the construction of highways and airports ever staged . . . for the first time, heavy machinery exhibited *AND OPERATED* out of doors in an area of over 1,200,000 square feet. 100,000 people will see it.

For information address

AMERICAN ROAD BUILDERS' ASSOCIATION

International Building

Washington 4, D. C.

Get 25% MORE CRUSHING AREA

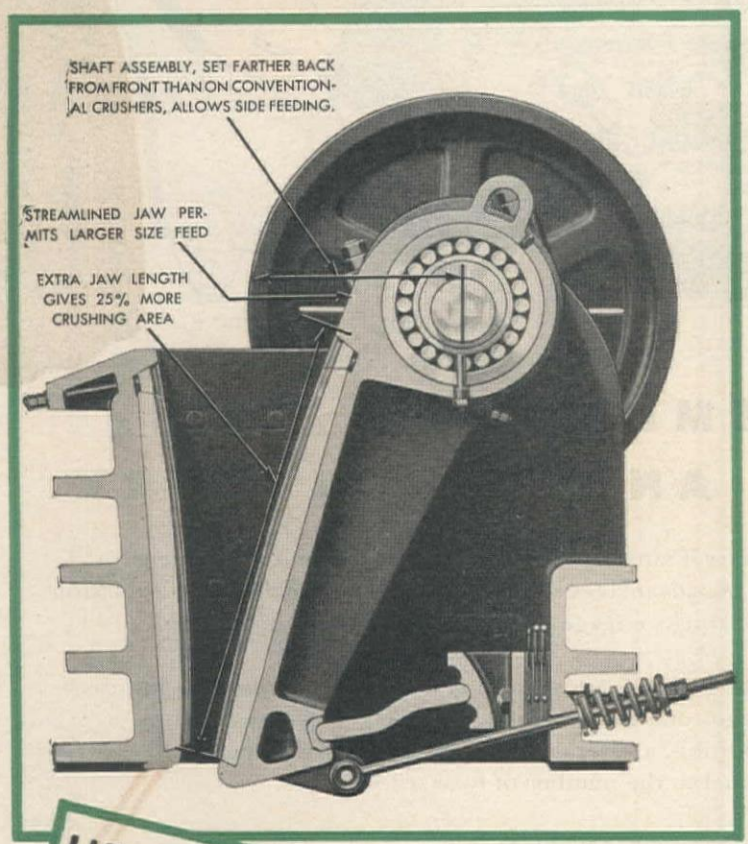
with LIPPMANN HEAVY DUTY ALLOY JAW CRUSHERS!

COMPARISON OF JAW LENGTH (IN.)

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

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

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



LIPPMANN ENGINEERING PRODUCTS for PITS, MINES, QUARRIES

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

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

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

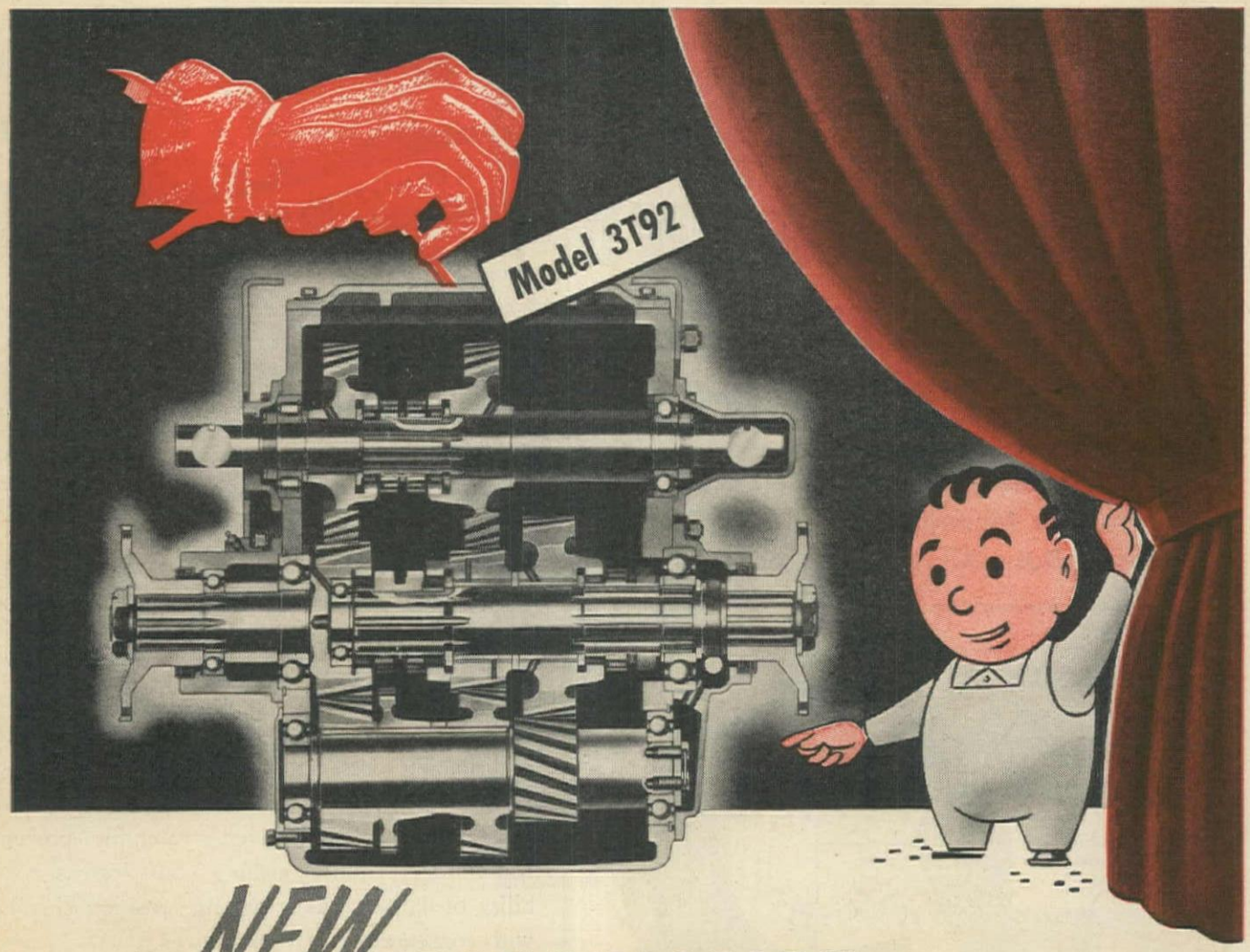
Remember, too, the Lippmann Heavy Duty Jaw Crusher is *designed* to take advantage of alloy steel's great structural strength. The *alloy* steel frame, jaw and bearing caps, plus forged *alloy* steel shaft, give you a rugged, high capacity crusher. *No Lippmann crusher, with proper maintenance, has ever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

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

Distributed by

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

LIPPMANN



A *NEW* TRANSMISSION FOR RIGGING AND WINCH WORK

The Model 3T92 Fuller Auxiliary Transmission . . . newest addition to the extensive Fuller line . . . offers you in a single unit the advantages of both a heavy-duty auxiliary transmission and a full torque power take-off for trucks engaged in rigging and other operations involving winch work.

The power take-off drive of the Model 3T92 Fuller Transmission is built into the transmission case . . . eliminating the inherent disadvantages of a top-mounted power take-off. Power can be taken off either end of the shaft . . . in addition, a reverse ratio is provided which permits a range of reverse power take-off ratios equal to the number of forward speeds in the unit mounted transmission.

The Model 3T92 Fuller Auxiliary Transmission takes its place in the Fuller line after three years of thorough testing in the field. It offers you the usual characteristics of Fuller Transmissions and Auxiliaries . . . including superior, quiet performance and long wear-life.

Prints and Specifications on request.

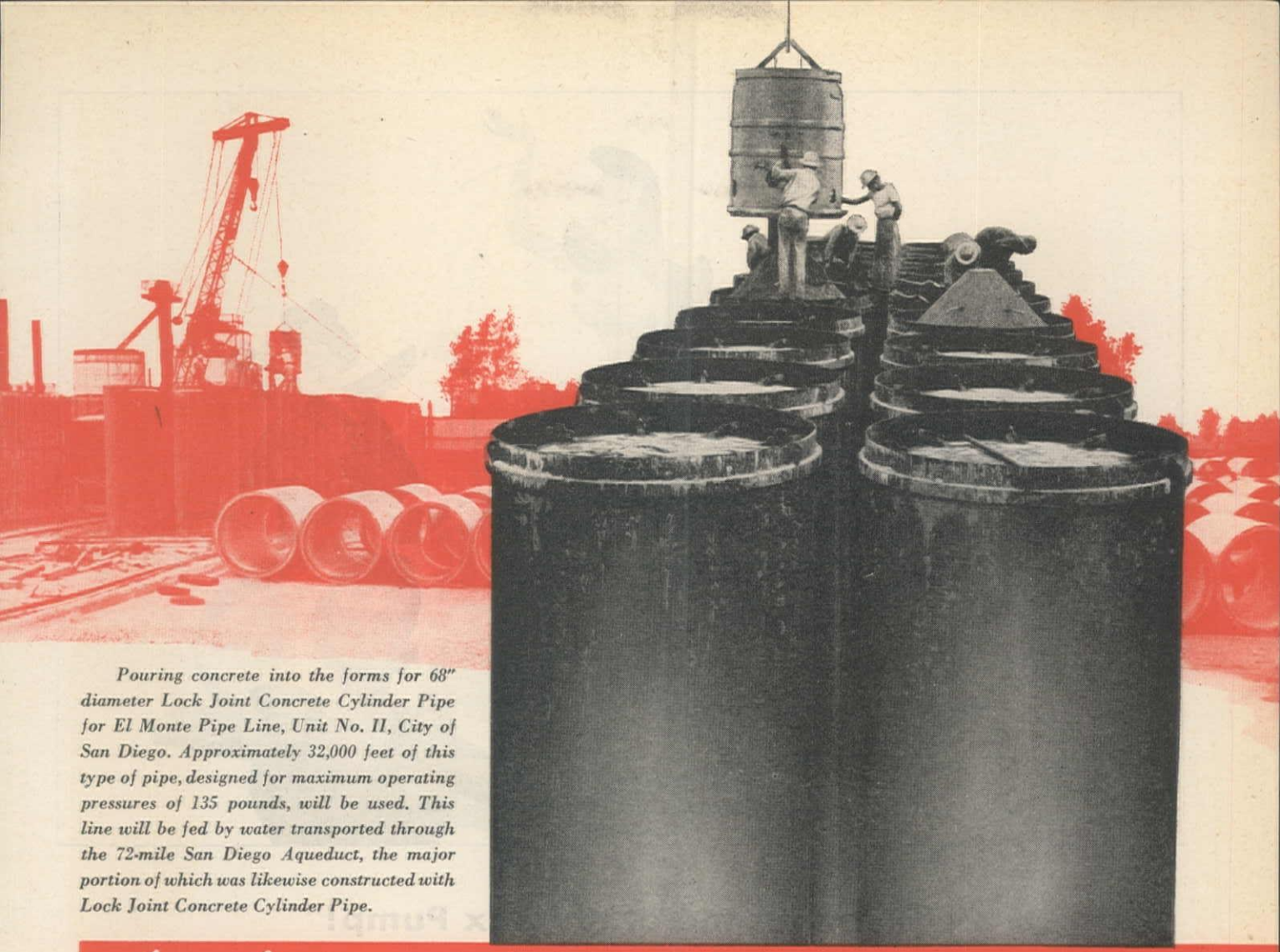
FULLER MANUFACTURING COMPANY, TRANSMISSION DIVISION

KALAMAZOO 13F, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wisconsin

Western District Office (Both Divisions): 308 Thayer Building, 577 14th Street, Oakland 12, California

Fuller TRANSMISSIONS



Pouring concrete into the forms for 68" diameter Lock Joint Concrete Cylinder Pipe for El Monte Pipe Line, Unit No. II, City of San Diego. Approximately 32,000 feet of this type of pipe, designed for maximum operating pressures of 135 pounds, will be used. This line will be fed by water transported through the 72-mile San Diego Aqueduct, the major portion of which was likewise constructed with Lock Joint Concrete Cylinder Pipe.

Another step forward – IN THE 75 YEAR HISTORY OF CONCRETE CYLINDER PIPE PROGRESS

One of the first important concrete cylinder pipe line installations in this country was a main water supply line for the City of Portland, Maine. Installed during the years 1868 to 1878, it was comprised of 154,000 feet of 20", 24" and 26" light gauge riveted iron cylinder pipe coated inside and out with natural cement concrete. Some 60 years later this old line was still in service when the need for a system of greater capacity was met by a new 48" line of Lock Joint Concrete Cylinder Pipe. Between the years 1868 and 1947, concrete cylinder pipe has become the foremost main water supply line material in the United States.

This El Monte pipe line is just another in the long series of successful concrete cylinder pipe lines which have been installed in recent years in this and other areas.

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

Quality Pipe Line Products Manufactured and Installed by American Include:

Lock Joint Concrete Cylinder Pipe

Prestressed Lock Joint Concrete Cylinder Pipe

American Concrete Cylinder Pipe

Centrifugal Concrete Pressure Pipe

Main Office and Plant –
4635 Firestone Blvd.
South Gate, California

District Offices and Plants –
Oakland • San Diego
Portland, Oregon

American PIPE & CONSTRUCTION COMPANY

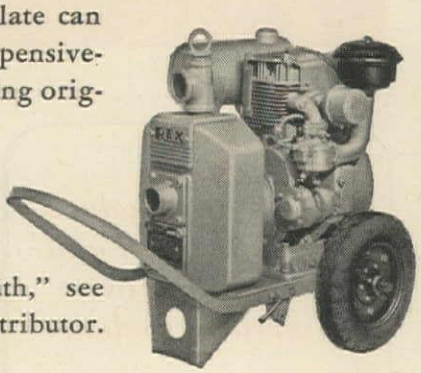
Concrete Pipe for Main Water Supply Lines, Storm & Sanitary Sewers, Subaqueous Pipe Lines

P. O. Box 3428, Terminal Annex, Los Angeles 54, California

"Reminds me of my Rex Pump!"

A Rex "Easy-Flow" Pump is always in the prime of life, thanks to its exclusive *adjustable* air peeler. For the priming efficiency of any self-priming pump is dependent upon its ability to peel air from the impeller. Rex assures top efficiency for the lifetime of the pump because Rex has the only peeler that can be adjusted to compensate for wear.

And, as a further aid to efficiency, Rex Pumps have a replaceable steel wearing plate that maintains the close tolerances between the side of the impeller and the volute so necessary for proper maintenance of vacuum. When wear takes place, the plate can be easily and inexpensively replaced, restoring original performance.

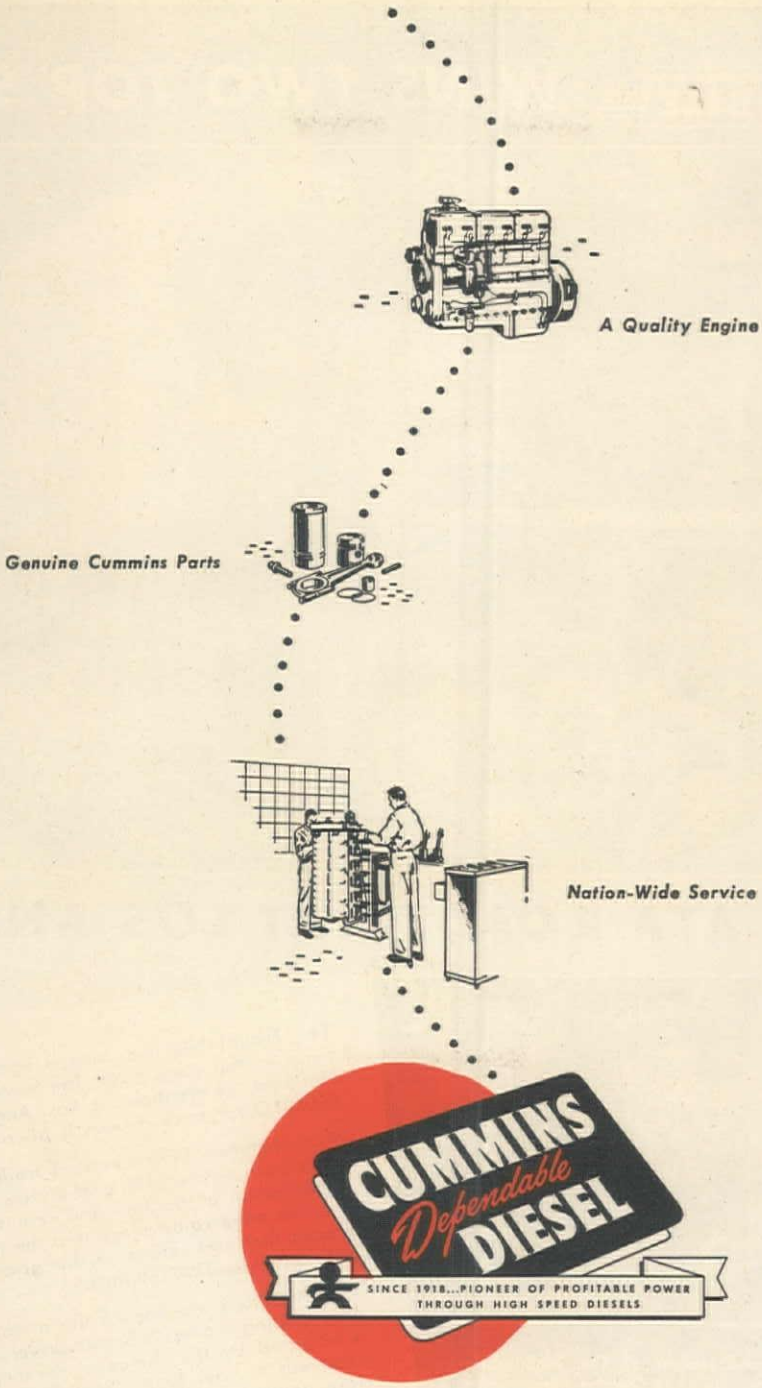


For all the facts on Rex, the pumps with the built-in "Fountain of Youth," see your local Rex Distributor.

ARNOLD MACHINERY CO. ..... *Salt Lake City 1, Utah*
BROWN-BEVIS EQUIPMENT CO. ..... *Los Angeles 11, California*
STATE TRACTOR & EQUIPMENT CO. ..... *Phoenix, Arizona*
CONSTRUCTION EQUIPMENT CO. ..... *Spokane, Washington*
CONTRACTORS EQUIPMENT AND SUPPLY CO. ..... *Albuquerque, New Mexico*
RAY CORSON MACHINERY CO. ..... *Denver, Colorado*
HALL-PERRY MACHINERY CO. ..... *Butte, Montana*
BOW LAKE EQUIPMENT CO. ..... *16826 Pacific Highway, Seattle 80, Washington*
WILSON EQUIPMENT & SUPPLY CO. ..... *Cheyenne, Wyoming*
INTERMOUNTAIN EQUIPMENT CO. ..... *Boise, Idaho*
LOGGERS & CONTRACTORS MACHINERY CO. ..... *Portland, Oregon*

REX

CONSTRUCTION MACHINERY



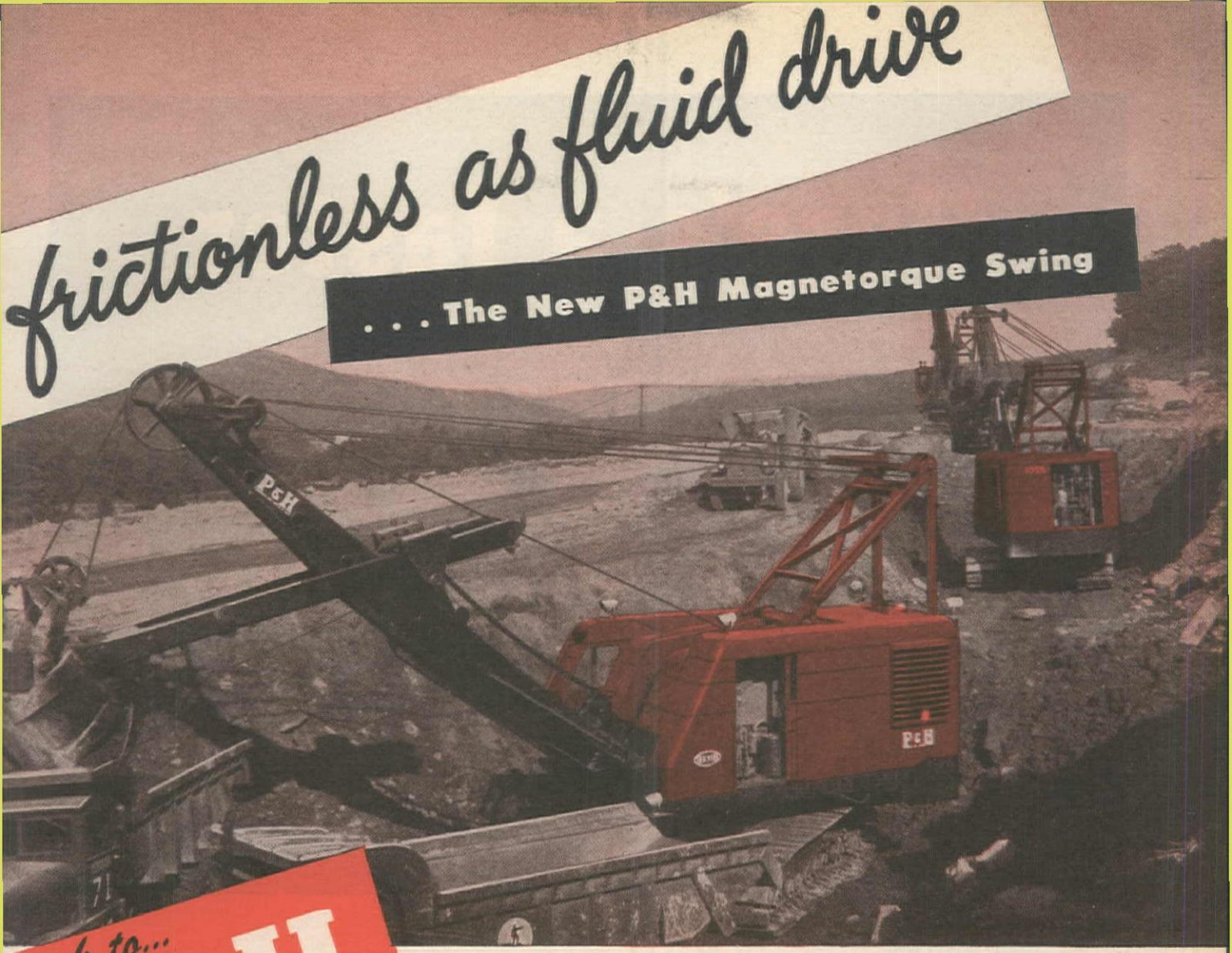
Protected Investment

Your investment in Cummins Dependable Diesels pays dividends because of their extra capacity for work . . . their low maintenance and fuel costs . . . their reliable performance with a minimum of downtime. Protection for your investment is assured by your Cummins dealer who makes available to you genuine parts, trained diesel mechanics and technical assistance no matter where or from whom your Cummins Dependable Diesel is purchased.

CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA

frictionless as fluid drive

. . . The New P&H Magnetorque Swing



look to...

P&H

for added values

Wherever you find the P&H Model 1055 on the job, you'll hear owners singing its praises for the new Magnetorque swing which marks the end of swing friction trouble and costly maintenance.

No Friction . . . No Friction Problems

The new Magnetorque solves the problems of old style swing clutches . . . by completely eliminating friction.

Without mechanical linkage . . . without friction . . . without wear — the Magnetorque transmits power for both swing and propel motions — and does it better.

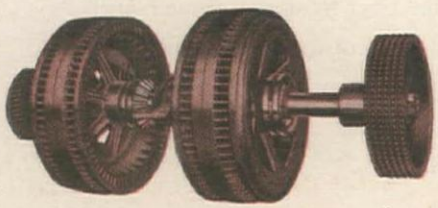
Makes Production Purr

Because it's smoother, faster, more responsive . . . because it permits quicker, more accurate stops and starts — the Magnetorque swing cuts wasted operating time, increases daily production and lowers yardage costs.

The Swing of a Lifetime

The Magnetorque is built to last the life of the machine. And during this time not so much as a single hour will be required for its repair, replacement, or maintenance.

It's one of the most important improvements in the past twenty-five years . . . users all over the country say so . . . performance has proved it. Write for complete information.



The New P&H Magnetorque Swing

Power for swing and propel transmitted by electro-magnetic forces. Operated by small generator on main engine; controlled from operator's station. Swing motions, slow or fast, have cushioned acceleration and deceleration. Because there is no friction swing, there are no friction problems. One more in the long list of P&H Added Values.

HARNISCHFEGER CORPORATION: SAN FRANCISCO, Calif., 82 Beale Street
Warehouses Service Stations: SEATTLE, LOS ANGELES, SAN FRANCISCO

PORTLAND 14, Oregon, Loggers & Contractors Machinery Co., 240 S.E. Clay St.; **WILLOWS, Calif.,** Willows Motor Sales Co.; **BAKERSFIELD, Calif.,** Kern Tractor & Equipment Co., 24th & N. 99 Highway—P. O. Box 1695; **NAPA, Calif.,** Berglund Tractor & Equipment Co., 1016-18 Soscol Avenue; **SALT LAKE CITY 1, Utah,** National Equipment Co., 101 West Second Street, So.; **BOISE, Idaho,** Olson Manufacturing Company, 2223 Fairview Avenue; **EL CENTRO, Calif.,** Faure Tractor & Equipment Company, 1414 Main Street; **FRESNO, Calif.,** Allied Equipment Company, 1824 Santa Clara St.; **SAN DIEGO, Calif.,** Southern Equipment & Supply Co., 868 Third Avenue; **SPOKANE 8, Wash.,** F. M. Viles & Co., Inc., East 124 Trent Avenue; **RENO, Nevada,** Dennison Tractor & Supply Company, 559 East Fourth Street; **SEATTLE 4, Wash.,** Glenn Carrington & Co., 91 Columbia Street.

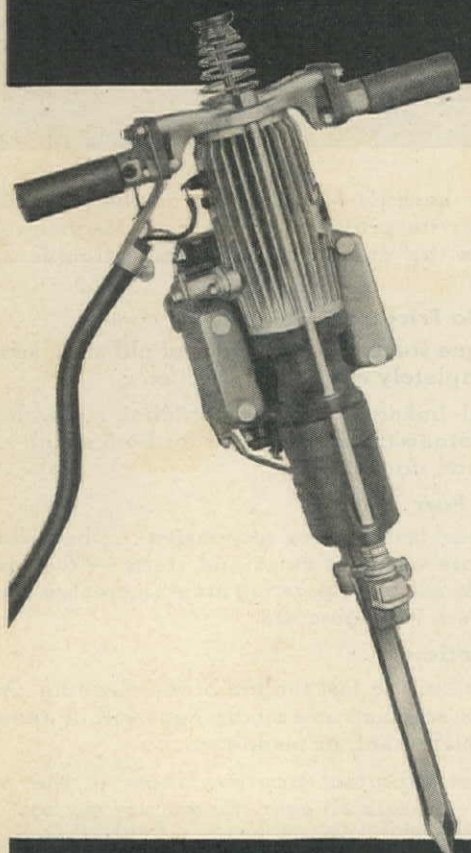
P&H **EXCAVATORS**

4490 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER
CORPORATION

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

Here's a faster more powerful Barco Portable Gasoline Hammer



Once again Barco comes through with a better Hammer than ever before. In recent demonstrations through the country the new model H6B Barco proved to the hammer experts that it has more speed and power than ever, *at no increase in weight*. Men praised Barco's new carburetor valve—said it was easier to operate. They liked the new method by which the cable is held—makes for easier handling and reduces wear on the cable where it leaves the handle. See the improved Barco Hammer now. You will agree that in speed, power and portability, Barco has no superior. For complete information, write to Barco Manufacturing Company, Not Inc., 1819 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

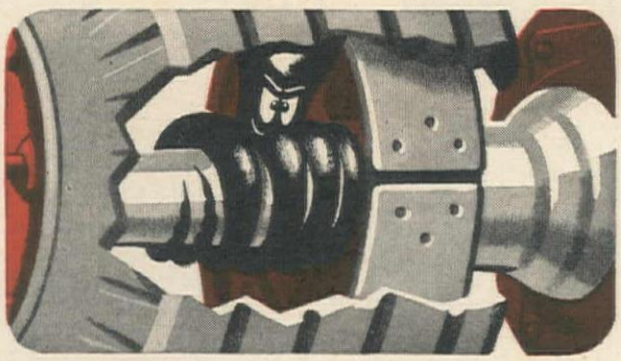
FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

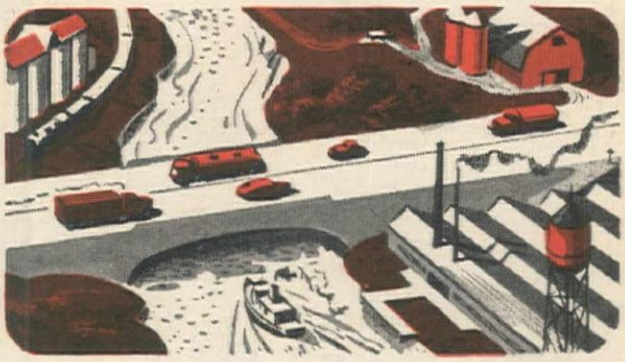
BARCO PORTABLE HAMMERS • **BREAKING · DRILLING DRIVING · TAMPING**

THIS NEW ALL-PURPOSE GREASE SIMPLIFIES ALL YOUR LUBRICATION!

1. UNOBA—the sensational new grease developed by Union Oil Company—is the first all-purpose lubricant in history that resists both heat and water! With Unoba, lubrication is greatly simplified, for this *one* grease performs jobs that formerly required *many* different types, grades and brands of greases!

2. UNOBA is a barium base grease with exceptional heatproof, waterproof qualities. Boiling water or dry heat won't cut its tenacious film. UNOBA will give effective lubrication for trucks or equipment at temperatures much below freezing. And at temperatures up to 300°F. it still protects your equipment.





3. In addition to these qualities, UNOBA has an unusual adhesiveness to metal, giving maximum protection against rust and corrosion of parts. It maintains excellent grease structure under severe mechanical working and does not deteriorate in storage even over long periods.

4. Today UNOBA is performing hundreds of different jobs in all branches of industry—in factories, mines and mills, and on construction jobs and farms. Why not simplify your lubrication with this unique *all-purpose* grease that protects against rust, prevents excessive wear and prolongs equipment life?

UNOBA

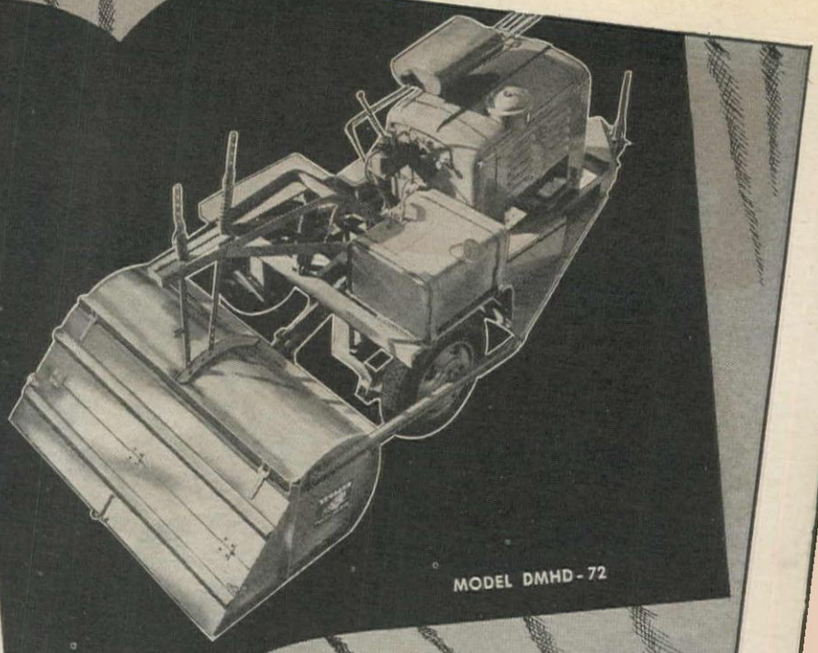
For additional information phone your local Union Oil Representative, or wire Sales Department, Union Oil Company, Los Angeles 14, California.

ANOTHER **UNION OIL** SUCCESS-TESTED PRODUCT

The SEAMAN MIXER

★ ★ ★

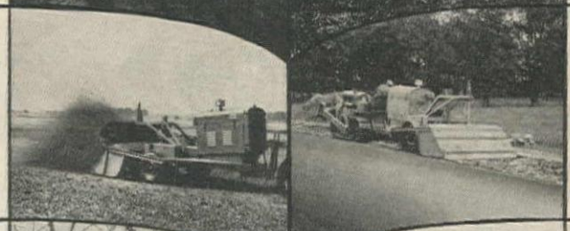
An All-Star PERFORMER in Seven Principal Roles



MODEL DMHD-72

1 Road builders find the SEAMAN produces a remarkably high quality of mix in soil-cement, clay-gravel, sand clay, calcium chloride and all types of soil stabilizations as well as in bituminous construction.

2 AERATION OF AGGREGATE. Hood open, the SEAMAN quickly and cheaply reduces excess moisture in aggregate. Same operation aerates solvents in a bituminous mix to hasten the set.



3 CLEARING PAVEMENTS OF SHEET ICE. The SEAMAN operating on ice covered streets and highways quickly breaks up the ice into small, easily removed fragments. Also will pulverize hard frozen drifts to facilitate work of snow plows.

4 BRUSH REMOVAL. In land clearing and for the construction of access roads and fire lanes the SEAMAN quickly clears brush and saplings at a fraction of the cost of hand labor.

5 SEED BED PREPARATION. At an amazing saving over tillage tools the SEAMAN prepares a highly pulverized seed-bed for nurseries, lawns, grassed back slopes and highway shoulders. Highly efficient also in mulching operations.

6 STOCK PILE MIXING. Engineers report the use of the SEAMAN in stock-pile mixing cuts costs as much as 40%. The SEAMAN is often described as equipment which produces "plant mix quality at road mix cost"

7 PULVERIZATION OF SOIL FOR STABILIZATION OR EARTH WORK. By no other method can soil be as thoroughly, as quickly, pulverized, — of primary importance in high load bearing stabilization of soil or in securing high densities in earth fills, dams, levees, etc.

SOIL STABILIZATION METHODS

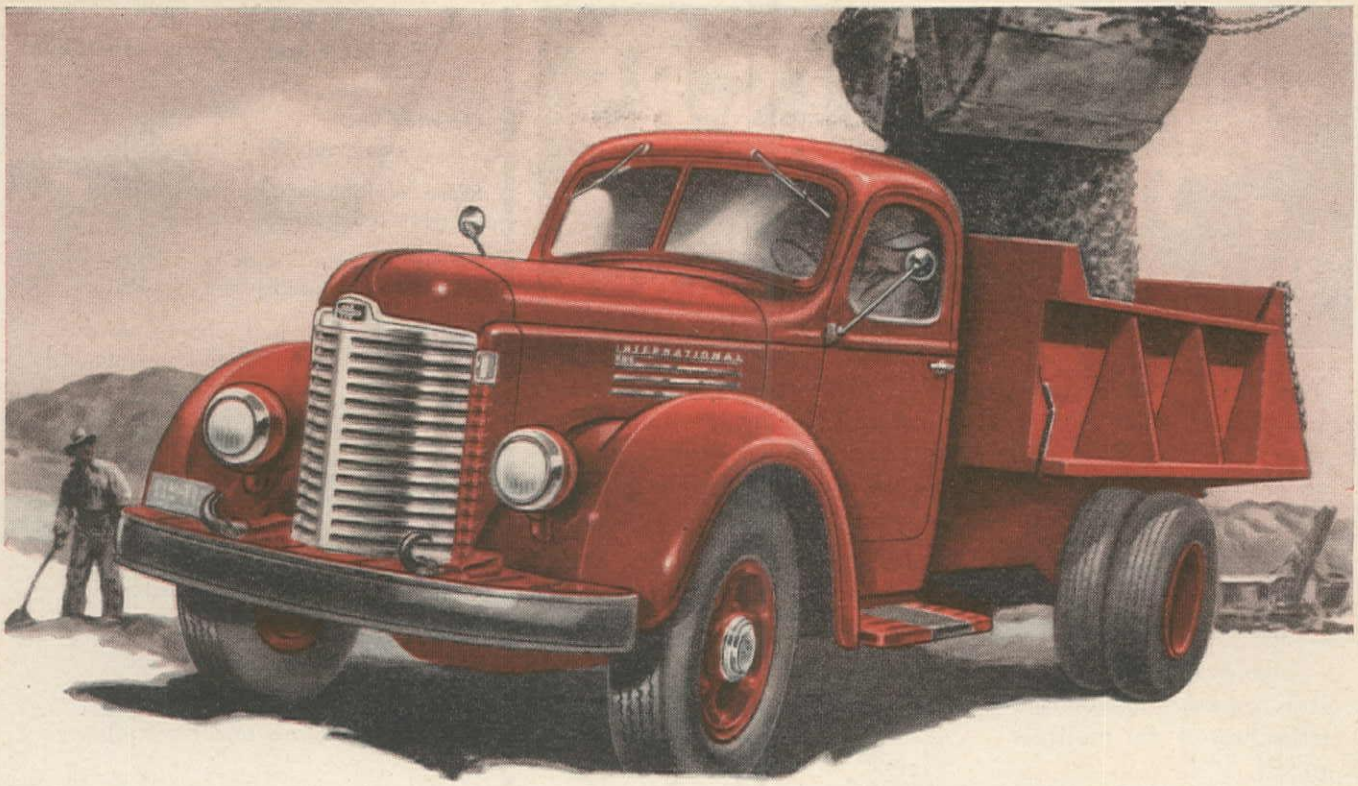
There are many more uses for the SEAMAN MIXER, — all of great importance to the road building industry, and all are described in the book "Soil Stabilization Methods" compiled by SEAMAN engineers. Write for your free copy. Ask for Bulletin N-25.

Presented by

SEAMAN MOTORS INC.

MILWAUKEE 3, WISCONSIN

Peerless Equipment Co., Los Angeles, Calif.; Buran Equipment Co., Oakland, Calif.; Contractors' Equipment Corp., Portland, Ore.; Service Equipment Co., Seattle, Wash.; Fred M. Viles & Co., Spokane, Wash.; Intermountain Equipment Co., Boise, Idaho; Sanford Tractor & Equipment Co., Reno, Nev.; Diesel Motor & Equipment Co., Phoenix, Ariz.



NOTE WHAT INTERNATIONAL TRUCKS OFFER

1. A Truck of the Right Size and Type for Every Job.

2. Performance-Co-Ordination.

3. Load-Co-Ordination.

Yes, International Trucks are money-makers on construction jobs for the three compelling reasons listed above.

They're Performance-Co-Ordinated. That means they're expertly fitted to their jobs. And that in turn means rock-bottom operating economy and long, trouble-free service.

They're Load-Co-Ordinated. And that means an expert recommendation from your International Dealer or Branch about the exact amount of payload *most* profitable for *your* trucks on *your* jobs.

International Load-Co-Ordination is based on the International Truck Point Rating System—exclusive with International—and a scientific system—(Note that!)—not guess work.

So no matter what your truck problem, see your International Dealer or Branch—for the right trucks, expertly Performance-Co-Ordinated and Load-Co-Ordinated to *your* jobs.

Motor Truck Division

INTERNATIONAL HARVESTER COMPANY

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

International Truck Branches located at San Diego, Los Angeles, West Los Angeles, Glendale, Fresno, Sacramento, Oakland, San Francisco, Portland, Tacoma, Seattle, Spokane, Salt Lake City, Denver, Cheyenne, Billings and Great Falls.

Tune in James Melton on "Harvest of Stars!" NBC Sundays!

THIS EMBLEM IDENTIFIES GREAT TRUCKS
INTERNATIONAL

INTERNATIONAL Trucks

what makes the LS-85 a "SUPER" 3/4 YARD SHOVEL-CRANE?

You don't "baby" the Link-Belt Speeders—especially the LS-85, with extra power, stamina and endurance built into every detail. Balanced weight, large turn-table, hook rollers and oversize center pin give ground hugging stability, perfect control and extra digging and lifting capacity.

Run your eye down the list of features at the right and you'll understand why the LS-85 has earned the name "Super" 3/4 yard.

Like every Link-Belt Speeder from 3/8 to 3 yard capacity, it is quickly convertible to every conventional front end attachment, for multiple use and multiplied profit.

- Independent Rapid Boom Hoist (Full Boom Radius, Faster Operation, Safety)
- Greater Power (Heavy duty 97 HP engine)
- More Weight for Greater Stability (44,200 pounds—Diesel)
- Greater Lifting Capacity (30,000 pounds)
- Positive, Independent Chain Crowd (Self-adjusting to all boom angles)
- Crawler Frames (With full length track support)
- Power Dipper Trip (Starter & Electric Lights with gasoline engine)
- Glass Enclosed Full Vision Cab
- Comfortable Seat for Operator
- Positive Traction Locking in all Directions from Operator's Seat in Cab
- Two Speed Traction (Both Forward and Reverse)

10.882

LINK-BELT SPEEDER

LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA

Builders of the Most Complete Line of SHOVELS-CRANES-DRAGLINES

Bonus* Built

THE AMAZING RESULT OF AN ENGINEERING PRINCIPLE THAT ASSURES LONGER TRUCK LIFE

...And ONLY Ford Trucks Have It!

Coming for 1948—a brand new line of Ford Trucks . . . new all through . . . and Bonus Built, too!

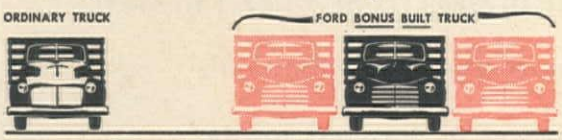
Soon you'll see the great new line of Ford Trucks—great not only because they are *new all through*, but because they are the amazing result of a time-proved truck building principle.

This principle is Ford Bonus Built construction. Here's what it means to you:

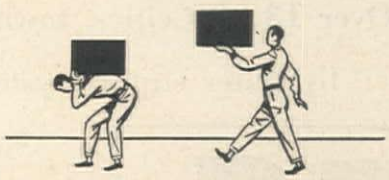
Every one of the new Ford Trucks for '48 is built with *extra strength* in every vital part. This extra strength provides WORK RESERVES that pay off in two important ways:

First, these Bonus Built WORK RESERVES give Ford Trucks a greater *range of use* by permitting them to handle loads beyond the normal call of duty. Ford Trucks are not limited to doing one single, specific job!

Second, these same WORK RESERVES allow Ford Trucks to relax on the job . . . to do their jobs with less strain and less wear. Thus, Ford Trucks last *longer* because they work *easier!*



Not ONE Capacity . . . but real RANGE when needed!



The load is carried EASIER by the stronger man!

Remember, every Ford Truck for '48 is Bonus Built for longer life, wider use. Keep in touch with your Ford Dealer . . . plan to see these new Ford Bonus Built Trucks for '48 as soon as announced. Don't settle for less—get the only truck that's Bonus Built! It's Ford!

***BONUS:** *"Something given in addition to what is usual or strictly due."—Webster's Dictionary.*

Listen to the Ford Theater over NBC stations Sunday afternoons, 5:00 to 6:00 p. m., E.S.T.

LIFE INSURANCE EXPERTS PROVE . . . FORD TRUCKS LAST UP TO 19.6% LONGER!

Original Woodcut by Lynd Ward

Farther and farther extend the outposts of utility services in which cast iron pipe plays so important a part. Over 13,000 cities, towns and services are served by water supply systems—8500 have gas service.

Sewerage facilities and treatment plants are rapidly increasing. Widely used for all these vital services, U. S. Cast Iron Pipe is available in sizes from 3 to 84 inches with bell-and-spigot, mechanical, ball-and-socket or flanged joints.

U.S. cast iron PIPE

U. S. PIPE & FOUNDRY CO.
General Offices: Burlington, N. J.
Plants and Sales Offices throughout U.S.A.

Operators know it!

Dynamometer tests prove it!

LaPlant-Choate scrapers load *25% easier!*

Gain an extra load every four trips!

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

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

and Here's Why!

- Low, wide bowl insures bigger loads with less power.
- Less weight per yard of capacity.
- Modern, open-top design for easy loading by shovel or dragline.
- All working force concentrated at center of gravity for easier, more efficient operation.
- Bowed offset cutting edge insures better penetration, keeps earth boiling up through center of bowl.
- Balanced weight distribution with big tires—completely interchangeable front and rear.

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FIRST in Value because they're FIRST in Performance!

K-12 ½ cu. yd. HOE

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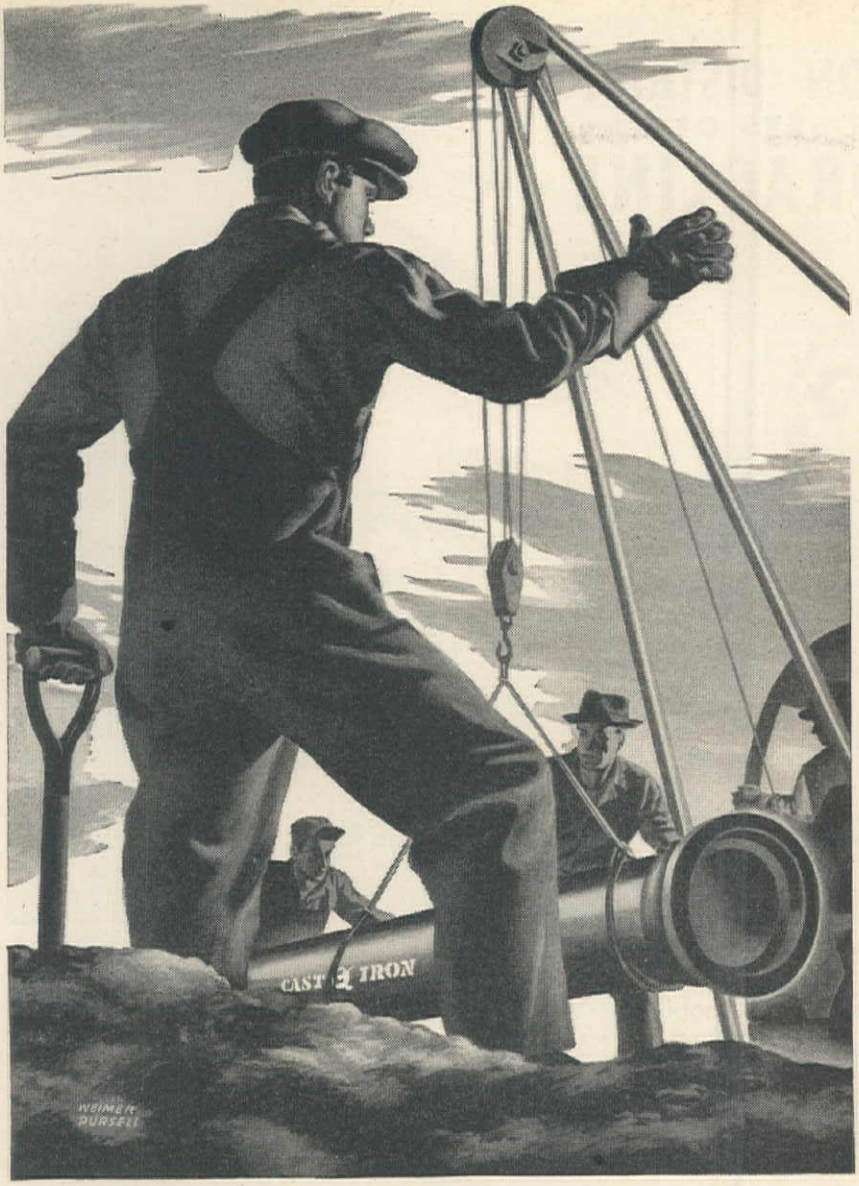

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More than half of the capital investment of public water supply systems in this country is in distribution mains, usually financed by bond issues with an average term of 30 years.

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But over 95% of all the water distribution mains in this country are cast iron mains with a known efficient life of at least 4 times the average term of an issue of water works bonds.

Cast iron mains go on serving for generations after the bonds issued to pay for them are retired and forgotten—saving millions in avoided replacement costs and millions in maintenance. A big reason why a ton of pure water costs less than a dime is the long life and efficient life of cast iron pipe. Cast Iron Pipe Research Association, T. F. Wolfe, Engineer, 122 S. Michigan Avenue, Chicago 3.

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SERVES FOR CENTURIES

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MERCED IRRIGATION DISTRICT
CHIEF ENGINEER SAYS OF
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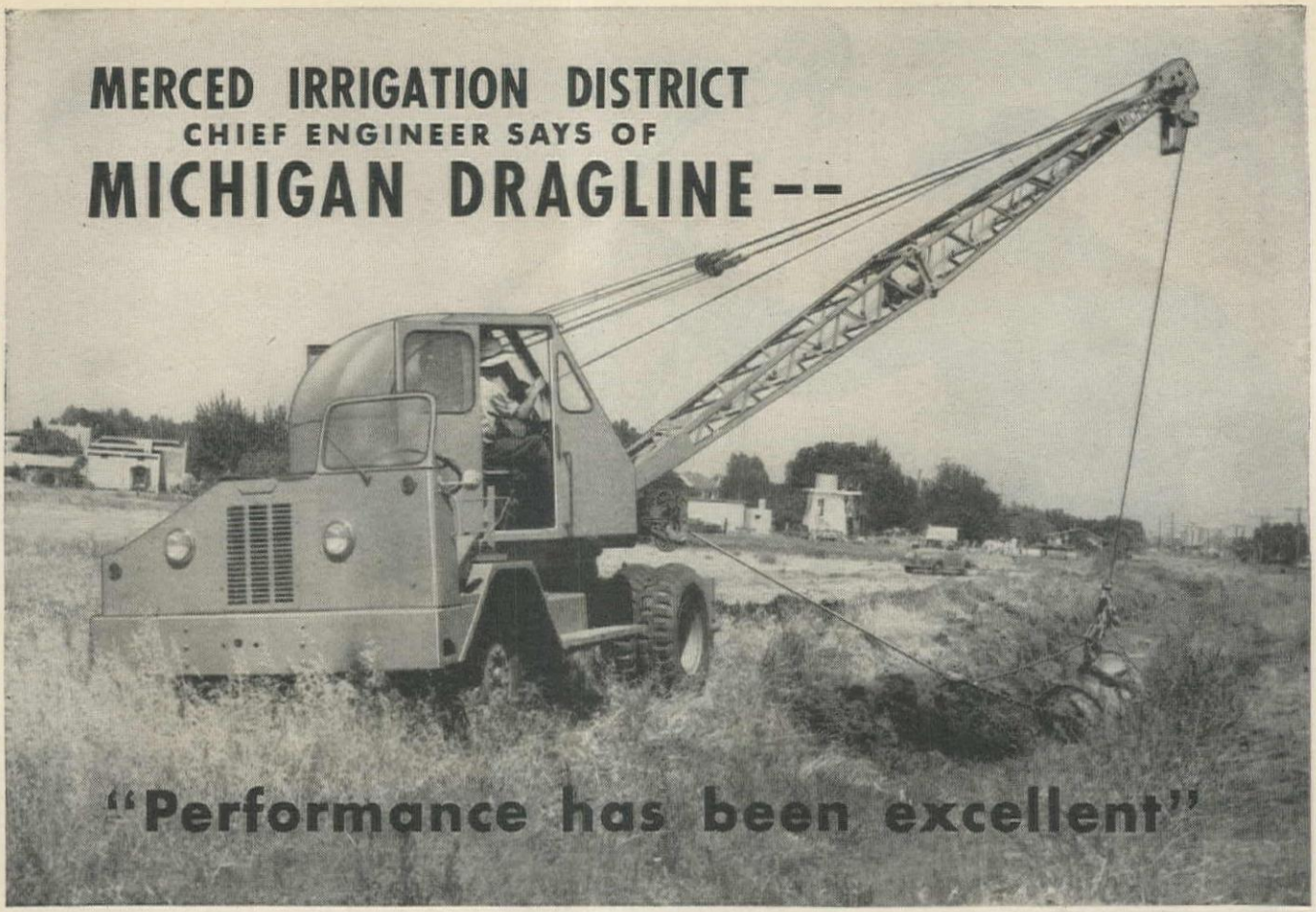

"The MICHIGAN gives us the flexibility and mobility required in our operations. Even in the short time we have had this machine, we have found so many uses for it that we wonder how we got along without it before. Performance has been excellent and we are looking forward to years of efficient operation."

Wherever you go, you'll find users enthusiastic with praise of MICHIGAN performance, economy, operating ease and time-saving truck mobility. Talk to any MICHIGAN owner and you'll see why so many become "repeat" buyers. See your distributor for details on the entire MICHIGAN line.

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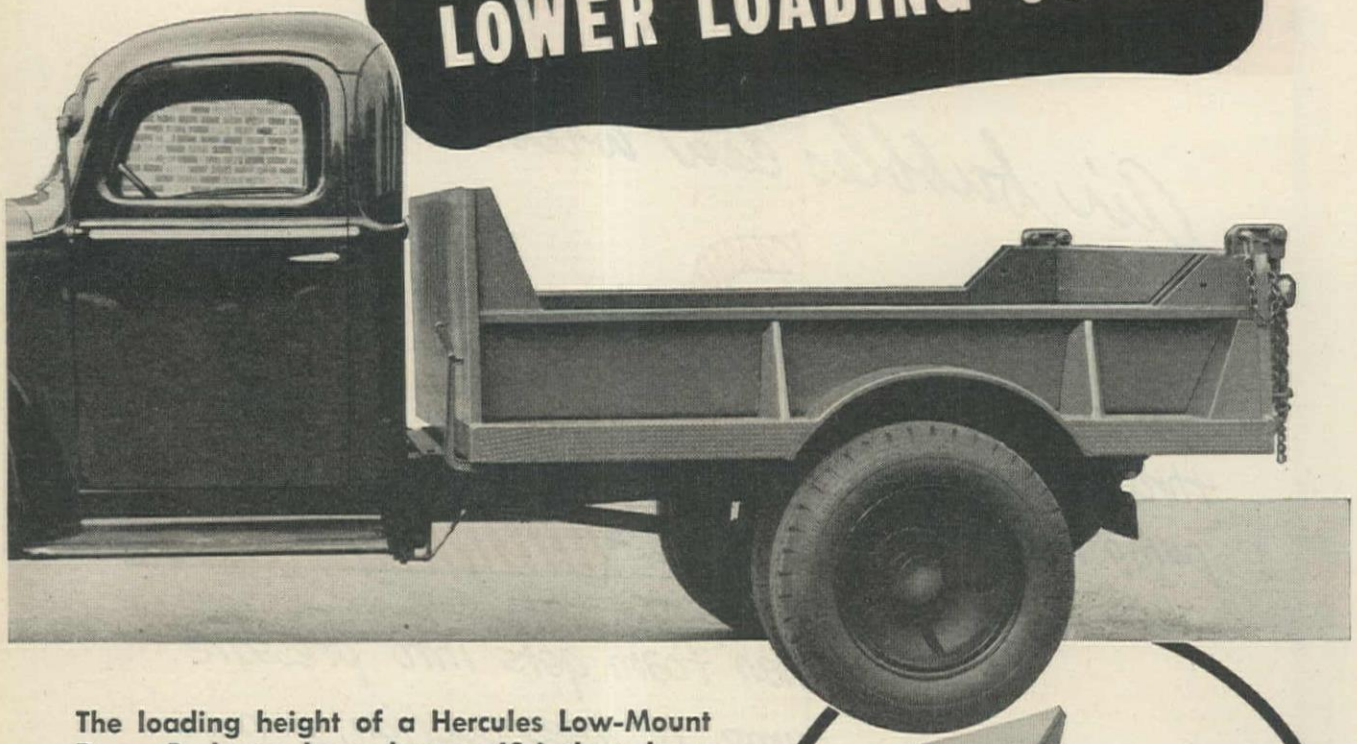

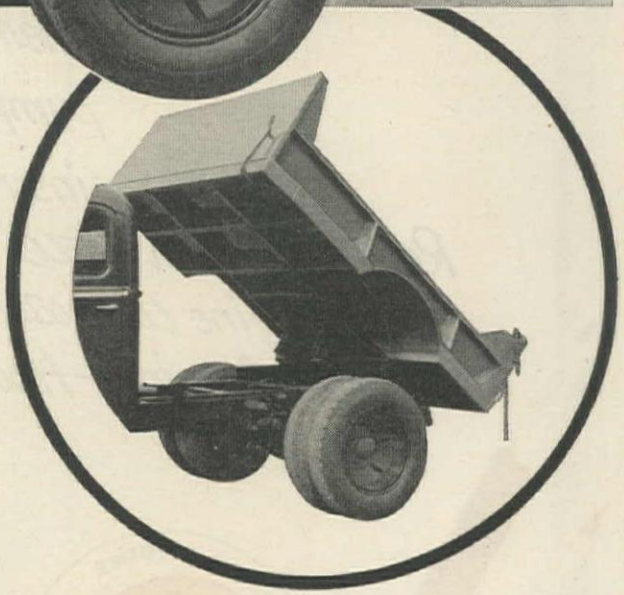

The loading height of a Hercules Low-Mount Dump Body can be as low as 48 inches above ground level (or lower, depending on body capacity) . . . that means time and effort saved on any job requiring manual loading. And you'll find the Hercules Low-Mount Body mighty handy on those jobs where overhead clearance is limited, too!

Equipped with a Hercules-BILT Hydraulic Hoist designed especially to minimize the usual 13″ or 14″ mounting height, this unit measures only five inches from top of truck frame to body floor.

Lower original cost . . . lower maintenance costs . . . lower loading height . . . lower loading costs . . . you get all four with the Hercules Low-Mount Dump Body. Complete details available, without obligation, on request.

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Schramm makes construction jobs easier because they furnish all the air you want, when and where you want it, economically and quickly. Just push a button and work starts. They're compact, lightweight, easy to move about on the job.

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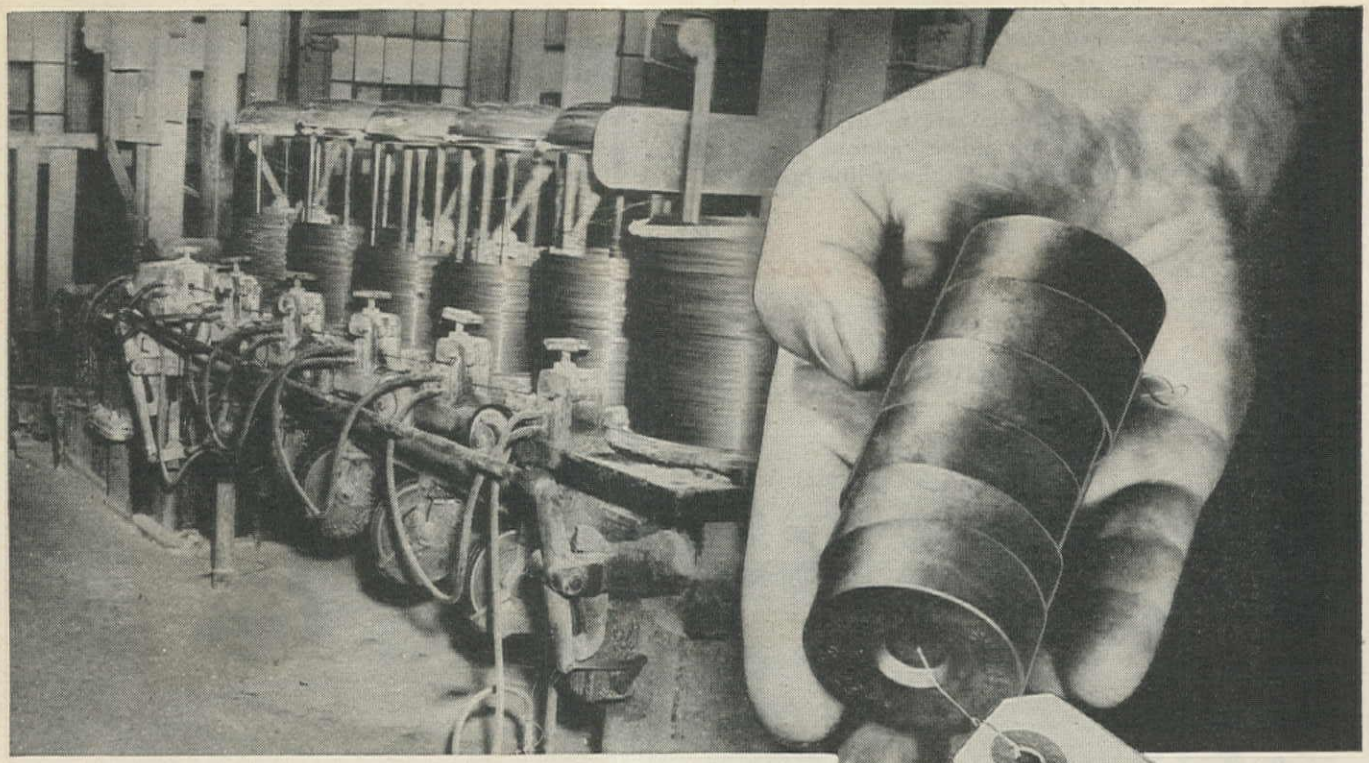
Schramm features: 100% watercooled to provide ideal performance winter and summer, without let-up . . . main bearings for every cylinder . . . mechanical intake valve . . . more cylinders and lighter parts . . . forced feed lubrication. Plus many more design points to provide rugged, reliable performance day in and day out.

Some users have likened Schramm to a "package" . . . a complete package which provides any amount of air, a model for every size need. Schramm has lots to offer you in its portable and stationary units, and we invite you to write us today for complete descriptive data on our complete line.

THE COMPRESSOR PEOPLE **SCHRAMM INC.** WEST CHESTER, PENNA.



Wickwire's wire drawing dies are accurate within .0003 of an inch.

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Drawing, cleaning, heat treatment—every step necessary to reduce Wickwire Rope Wire to final size is closely supervised. The finished wire is accurate within a fraction of a thousandth of an inch. Production of strands and finished ropes is equally exacting.

All this adds up to Wickwire Rope being the logical choice of rope users who demand the utmost in performance, safety and long life. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY *Pre*formed. Wickwire Distributors and Rope Engineers are always ready to help solve your wire rope problems and supply the right rope for your needs.

HOW TO REDUCE ROPE COSTS AND PROLONG ROPE LIFE

Thousands of wire rope users have found that the information packed in the pages of "Know Your Ropes" has made their work easier. It's full of suggestions on proper selection, application and usage of wire rope. It's easy-to-read and profusely illustrated. For your free copy, write—Wire Rope Sales Office, Wickwire Spencer Steel, Palmer, Mass.

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PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

LE ROI announces The New No. 11 Backfill Tamper

. . . built by rock-drill men to rigid rock-drill tolerances—gives you longer life, easier holding, faster tamping

HERE, for the first time in rock-drill history, you have a tamper that is *really* built to take it. That is why Le Roi No. 11's outperform — outlast any other make. Look at these features:

Tough, protective armor — high-strength drop forgings are used for the backhead, cylinder, piston, and throttle lever.

Engineered impact blow — just the right kind of wallop — it properly compacts the fill, and it makes possible the easy handling that further speeds tamping.

Smooth, frictionless action — new metal-foil packing prevents piston stem from scuffing — increasing its life.

Sealed from grit and dirt — Le Roi wiper construction in front-bumper retainer keeps harmful foreign matter out of the machine.

Trouble-free valve — extremely low air consumption and long-life efficiency result from using the new Le Roi valve design.

Leak-proof throttle valve — bushed throttle valve eliminates air leakage and prolongs life.

Quieter, non-freezing exhaust — new Le Roi construction not only prevents freezing but also reduces noise.

Positive, thorough lubrication — large oil reservoir holds ample lubricant, assuring protection for all the working parts — and longer life.

Easy to inspect — self-locking thread on the back head and snap-in key on packing retainer permits easy assembly, disassembly, and packing adjustment. Butt, firmly held by a straight splined taper on the piston rod, can be quickly removed.

The Le Roi No. 11 Tamper weighs 34 pounds. It has a 1½-inch bore and a 7-inch stroke. Length overall is 47½ inches. Speed up your tamping operations — equip your men with new Le Roi No. 11's. See your nearest Le Roi distributor.

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RD-14

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A vertical bucket-type elevator conveys the raw materials from the carloading platform to a shuttle-type conveyor over the tanks and fills them from the top. Six automatic scales are located beneath the tanks. These scales are loaded through automatic gates and the materials are automatically weighed onto a conveyor belt which moves the material to a skip hoist. The hoist elevates the material to a mixer located on the fifth floor of the batch house (the tall structure shown at the right in the above view).

Special steel plate structures can play an important part in economical and efficient plant operation. Let us work with you the next time you require steel plate structures of any type. Write our nearest office for quotations.

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December, 1947

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

Vol. 22, No. 12

Mike Straus Can't Read

WE'RE SURE he can read English, for we've frequently seen Mike Straus, Commissioner of the Bureau of Reclamation, stand on a platform and read a prepared paper, but he certainly can't read the "handwriting on the wall!" Although Congressmen, publications, engineers, irrigation farmers, politicians, and stooges, repeatedly point out his blunders and the undesirable features of his program, he insists on going blandly, blindly on his course toward the destruction of confidence in the Bureau, and of his own political future.

So deep-rooted is his conviction that the average American, and particularly the irrigation farmer, is too stupid to know what is good for himself, and that these stupid millions must have their lives and actions regulated by omnipotent beings in Washington, that Mike forgets he is but the hired servant of those very people.

In their dire need for water on their parched acres, they have assigned to him the task of building works to furnish it, but he arrogantly assumes the right to select which farmers may have water and which may not; to use electric power revenues, which they had hoped would help repay their construction costs, to implement his private ideological war with private power companies; to tell them that by the simple act of putting their problem up to him, they have forfeited their ownership of their precious water rights and that hereafter he will rent their own water to them for the period of their good behavior; to threaten that if they do not sign 9E contracts or agree to break up producing farms into small parcels, he will withdraw project offices and not even survey their problems; to send his land-use specialists to tell each farmer what he must raise and what not; and to wreck one of the outstanding engineering organizations of the world, all in order to change traditional and successful free Americanism to his particular variety of planned economy.

So serious has the situation become that the Western State Engineers, the state officials most closely associated with the Bureau, passed a resolution in their recent convention urging that "control of the Bureau be returned to those experienced and qualified for such work," . . . . . "those capable of maintaining the high standing of the Bureau and the confidence formerly held in it by Congress and the people."

At the recent convention of the National Reclamation Association in Phoenix, virtually every major speech except those of Interior Department employees, took more or less exception to Bureau policies. Some were violently in opposition. The resolutions were similar. Those in attendance at the Convention were farmers, engineers, officials of local government bodies, Chamber of Commerce leaders, and others whom Straus (on paper, at least) professes to be helping. Yet, with virtually no exception, they who live on the land and understand the local problems, do not approve the plans dictated from Washington. It was clearly a case, at Phoenix, of the people vs. Mike Straus.

The outcome of such a conflict is inevitable. The "voice of the people," may be slow, but it is powerful. Mike Straus is a servant, not a ruler, and since he has proved himself either incapable or unwilling to read the handwriting which appears daily in larger, blacker script on his wall, urging him to change his policies or get out, he will one day soon be ousted from his position. A date we cannot set, but the strength of the protest cannot be denied.

Two Mistakes, Charlie!

CHARLIE PURCELL, California's Director of Public Works, is a friend of ours. But friends as well as antagonists can make mistakes, and we feel constrained to call Charlie's attention to two which he and Governor Warren made a few days ago.

As members of the State Toll Bridge Authority, they are committed to construction of a second high bridge across San Francisco Bay, closely paralleling the present structure, to relieve the heavy congestion on the existing bridge. But a lot of people are crying for the relief bridge to be built on the route proposed by an Army-Navy board a year ago, several miles southerly of the present bridge. (Heaven knows why they're crying for it, Charlie; we can't see any justification, either, but they are, and loudly.)

So at a meeting of the Authority, Charlie and the Governor announced they'd build **both** bridges, but of course would conduct studies to see which merits construction first. And they announced that the cost of the two would amount to $239,468,000. In this announcement, they committed two grave errors.

First, no one can fail to understand that it was a crude political move to hush up proponents of the southern crossing; if anyone in San Francisco doesn't know which bridge will be indicated by the "further studies" he's welcome to visit our office to learn his ABC's! In fact, at the meeting, Bridge Engineer Panhorst laid the groundwork by stating that "we already know a great deal about foundation conditions on the parallel site, but little about them at the southern site."

Second, they made themselves ridiculous on the matter of costs by spotlighting the fact that for $39,000,000 less than they propose to spend, the Reber Plan, with infinitely more advantages, and with unlimited traffic crossing possibilities, can be completely constructed. The two bridges, as a maximum, will provide 18 traffic lanes; the Reber Plan makes as many as 50 available. The bridges will not bring railroads to San Francisco; the Plan will. The bridges will do nothing about the critical water problem in the Bay region; the Plan will furnish an ample supply of fresh water for all Bay area needs. The bridges are difficult of defense; the Plan's dike is indestructible.

Yet they ask for more money to build something of very limited usefulness. Two bad mistakes, Charlie!

All Force Account

SOMEBODY SLIPPED something over on the National Reclamation Association at its recent meeting in Phoenix. We have a very strong suspicion that the somebody was the man mentioned above who can't read, or some of his cohorts. We refer to a resolution, No. 3 of the 25 adopted, which puts the association on record as recommending to the executive and legislative branches of the government that the Bureau of Reclamation be afforded "full opportunity for the exercise of engineering judgment as to occasions on and the extent to which force-account work should be performed in connection with the federal reclamation program."

In spite of diligent inquiry we were unable to learn who had proposed Resolution No. 3 to the Resolutions Committee, and one member of that committee said "After all, this is not the law of the land; how can it hurt you?"

That may be true, but you may rest assured that Mike Straus will not hesitate to push it vigorously. With or without association aid he will wave this resolution before the Appropriations Committee and ask for the recommended blank check. The Reclamation Association's officers should promptly, vigorously, and publicly renounce Resolution No. 3.

FINISHING A SLOPE . . . without leaving tire marks

BUILDING A ROAD . . . moving a tremendous windrow.

MIXING BLACKTOP . . . all wheels miss the windrow.

RIDING A LONG SLOPE . . . All-Wheel Steer holds both ends steady.

CLEANING A WET DITCH . . . keeping rear truck on road.

"99-H"

Built to Outperform

No Motor Grader without All-Wheel Drive and All-Wheel Steer can hope to equal the all-around operating efficiency of the Austin-Western "99-H" Power Grader, with its High-Lift Blade, Extreme Blade Reach and Completely Reversible Blade.

On the "99-H" there are no idling front wheels—no dead front end to consume power and decrease operating efficiency. The entire weight of the machine is on the driving wheels—front and rear—contributing 100% to traction, and getting the most out of the 13-foot blade.

All-Wheel Steer provides unequalled maneuverability; saves time on every job; makes it possible to work in places where ordinary motor graders cannot go—do things they cannot do.

AUSTIN-WESTERN COMPANY • AURORA, ILLINOIS

Yes - it's the Power Grader that has Everything

SLOPING A BANK . . . using high-lift blade.

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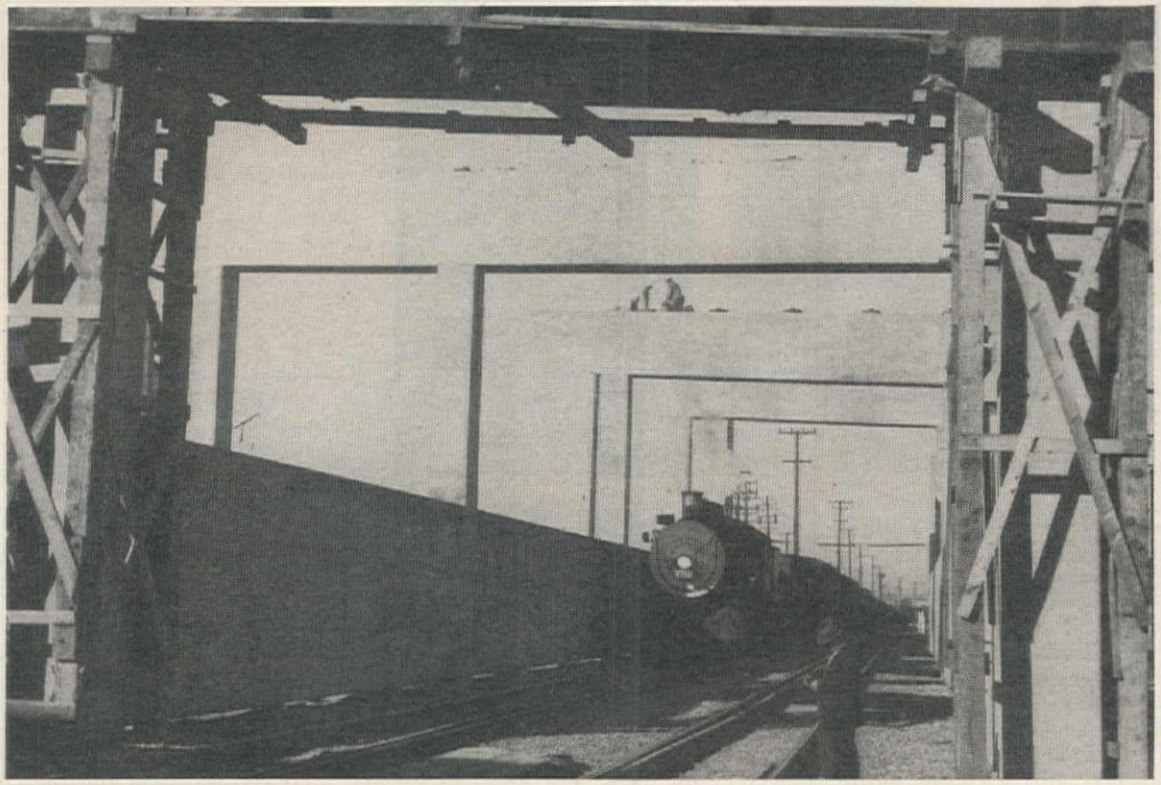


WORK IS INTERRUPTED by the passage of a Southern Pacific freight under the partially completed structure. Provisions of the contract required that no interruption or slowing of train traffic would result from any construction operation.

Eastshore Freeway— Construction of Fifth Ave. Overhead

Highest in cost and most difficult to design and construct of the freeway structures nears completion—Overhead in Oakland will be the first completed link of the ultra-modern six-lane highway to extend 70 mi. from Richmond to San Jose

THE NEW EASTSHORE Freeway which will eventually connect San Jose at the southern tip of San Francisco Bay, and Richmond, most northerly of the East Bay cities, with an ultra-modern highway, is beginning to materialize in actual construction. The Fifth Avenue Overhead, highest in cost and most difficult to design of the Freeway structures, now looms large as it nears completion.

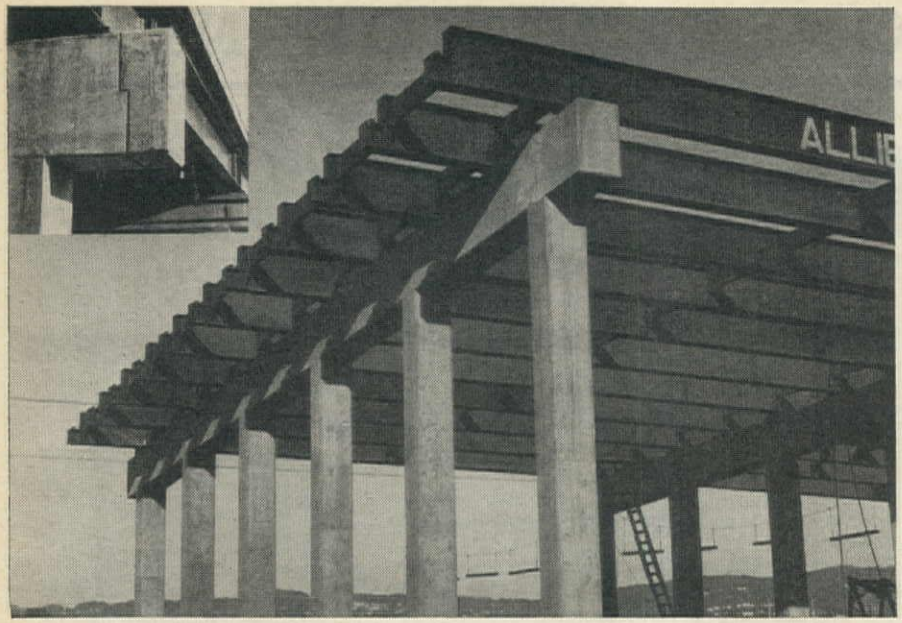
This overhead, first of the Freeway structures to be put under construction, will elevate traffic over four tracks of the Southern Pacific and Western Pacific railways, the Lake Merritt canal and Fifth Ave. as it runs parallel to the Estuary and west of East Eighth St. in Oakland. Under construction since June, 1946, it is now about 85 per cent completed, and the final touches should be added by the end of January.

Upon completion, the overpass will be the first link in the Oakland portion of the planned Eastshore Freeway. This main traffic artery to the south is planned as a six-lane, high-speed highway without a cross street or a traffic light.

Being built at a cost of more than $1,800,000, the overhead will take Freeway traffic from ground level at a point opposite Eighth Ave. between the Southern Pacific tracks and the Oakland Estuary, over the tracks and Fifth Ave. to descend near Oak St. It curves as it extends 2,554 ft. with both a horizontal and vertical curve. With the super-elevation, this provided a difficult engineering assignment, both for design and construction. Maximum grade is 4 per cent and maximum super-elevation is 6 per cent, while the horizontal curve has a radius of 2,000 ft. and the vertical curve is designed with a radius of 1,550 ft.

Skew crossing

Intensifying both design and construction problems as well was the necessity for crossing both sets of railway tracks at more than a 70-deg. skew. Bents and footings at these crossings differed widely from the typical bent of the structure, and construction operations had to be carried on without interrupting traffic on the tracks. Most of the overhead is supported on six-column bents with columns placed on continuous concrete footings. Where the overpass crossed the Southern Pacific tracks, it was necessary to design eight four-



SYSTEM OF cantilevered 36-in. I-beams to carry deck shown in position. Joints can be seen where shorter stringers will be suspended between alternate bents. Inset shows construction joints included at cap extremities as future widening provision.

pile bents and two five-pile bents. Both the footings and columns were skewed to align with the tracks. The individual footings to support the columns at this point were designed necessarily massive, the largest measuring 21 by 10 ft.

Below the surface of the ground, which would appear stable to the casual observer, is the usual Bay mud, making it necessary to set every footing on piles and to allow for shifting of the entire structure to compensate for the unstable foundation conditions. As many as 65 piles of untreated Douglas fir are placed beneath one of the continuous concrete footings with maximum pile loading being 21 tons.

Foundation problems

At the west end of the overhead structure, foundation problems were especially serious. Toward the west abutment, the mud extended upward almost to the surface, and it was necessary to backfill with gravel and sand before operations could continue. Piles at this end had to be driven as much as 85 ft. before stability requirements were satisfied. Where the structure spans the Lake Merritt canal 300 ft. from the west end, the surface was marshy as well. Here, it was necessary to build a timber wharf supported on 20-ft. piling to support machinery. Cofferdams of 30-ft. steel sheet piling were used in construction of footings in this region. A 100-ft. Universal pile driver and a 2½-yd. Link-Belt crane with a 110-ft. boom and free swinging leads were used to drive piles.

Mud was so unstable at places that the first drop of the hammer would sink the pile as much as 35 ft. The driver was operated on skids in some places to keep the surface from collapsing under the concentrated load.

A-FRAME supported pile driver at left was driven by a 3-drum steam engine mounted on skids and hinged for driving batter piles near canal. Below, driving a 75-ft. pile, and right, 30-ft. sheet piling cofferdam encloses one of the continuous footings.

Footings near the canal are placed from 5 to 10 ft. below datum sea level, and 20 ft. below the surface of the ground. All of the footings are below the water level at times depending on the fluctuation of the tide, so that it was necessary to take precautions against any open pores in the footing concrete, which was mixed with a maximum aggregate size of 2½ in. Cement was painted on the outside of footings where porosity appeared too great. Footing excavations were backfilled with clean gravel.

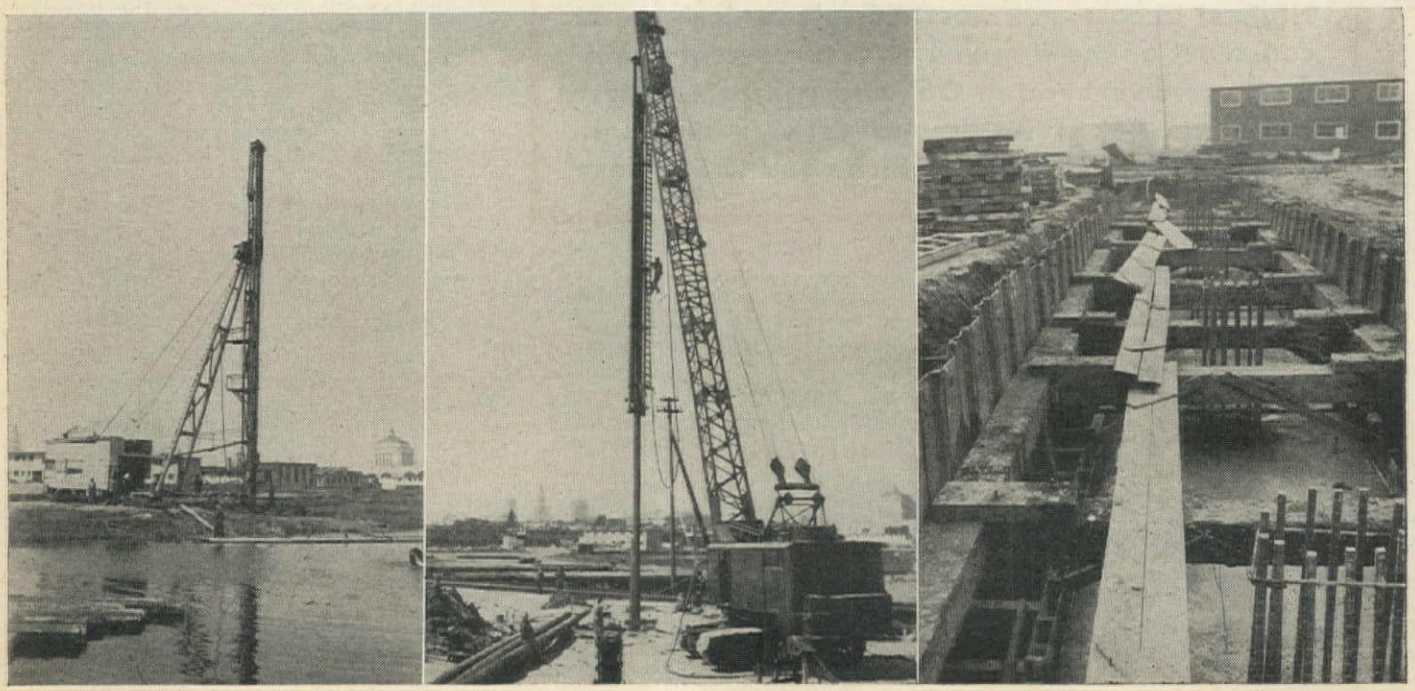
At the east end of the overhead, the shell of comparatively solid earth and gravel extended 6 ft. or more deep, and piles had to be driven no more than 35 ft. below the continuous footings.

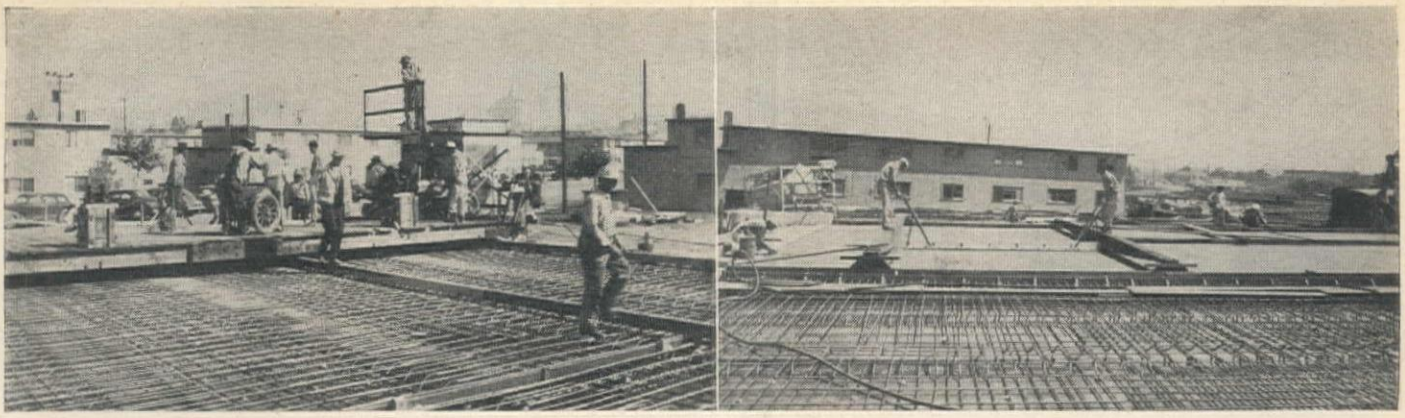
Stringer design

Supported on top of the concrete columns and caps are the 36-in. rolled steel I-beams which carry the reinforced concrete deck. This system of stringers supports the deck with no direct connection between the steel and the concrete and no direct connection between the consecutive stringers.

Both of the joint types consist of a 3-in. square bar for bearing placed within a 1-in. keeper plate. This allows ½ in. of shifting tolerance on all sides, and allows for both expansion and the shifting which is inevitable because of the unstable foundation material.

Alternate beams are cantilevered beyond the bent caps as continuous spans so that the shorter beams are suspended on the bearing joints between every





PLACING DECK concrete near the west abutment. Concrete is mixed at batch plant, delivered by truck to buggies at bridge. Finishing of slab shown at right.

other bent, providing alternate positions of joints and keeper-plates in each successive bent. Combined with the bearing joints between the stringers and the caps, this provides for all lateral shifting which might be possible. Two cranes were used for swinging the 3½ and 6-ton beams into place. Some difficulty was encountered in maneuvering the shorter, suspended beams into place since some of the piles had already shifted to cut down the ½-in. tolerance allowed by the keeper plate.

Special problems

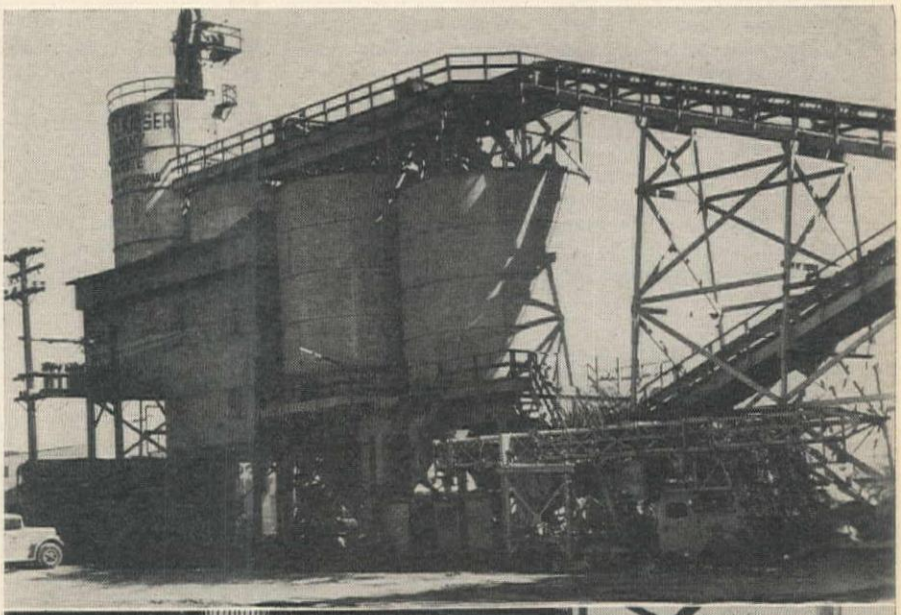
Where the overhead crossed the Western Pacific tracks, only enough room was available for using three columns to support the superstructure. Four columns might have been used but this would have necessitated a design involving concrete caps of such great depth that the minimum clearance of 22½ ft. could not be maintained. This portion of the overhead is constructed with steel columns and pre-fabricated steel cross beams. The 15-ton steel caps are cantilevered 8 ft. on each side to allow for future expansion of the roadway if desired.

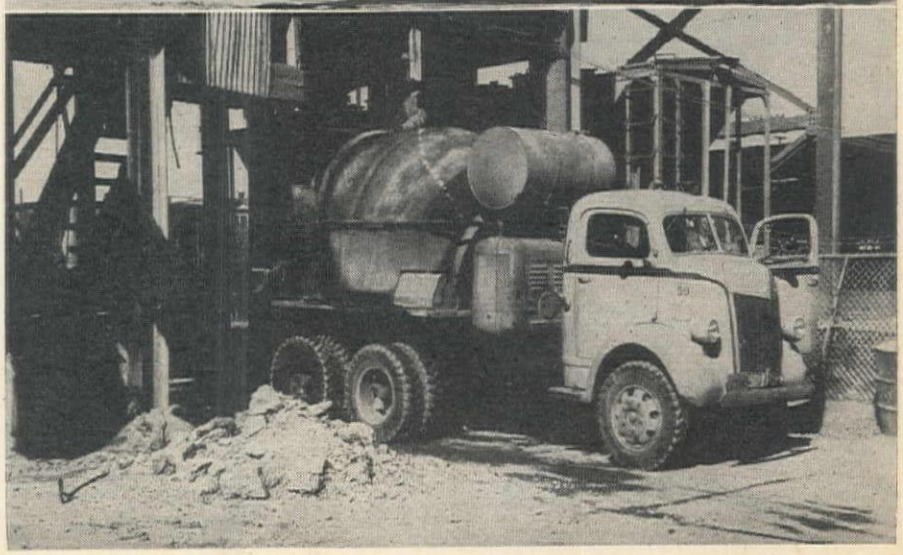
The concrete caps in the remainder of the overhead are provided with construction joints near their ends which may be knocked out to allow the caps to be cantilevered out to support additional roadway if and when needed. Three feet of steel is bent within the joint to provide a tie for the extension of the caps.

The overhead crossing will provide a roadway of Portland cement concrete with a width of 80 ft. between curbs, a 4-ft. division strip and two saftey curbs. All concrete is being mixed at the Henry J. Kaiser batching plant which is set up 500 ft. east of the new structure. At the plant, the cement is pre-shrunk and mixed before it is loaded into the trucks. The 5 trucks used for transporting concrete are 4-cu. yd. Rex Moto-Mixers mounted on Ford chassis.

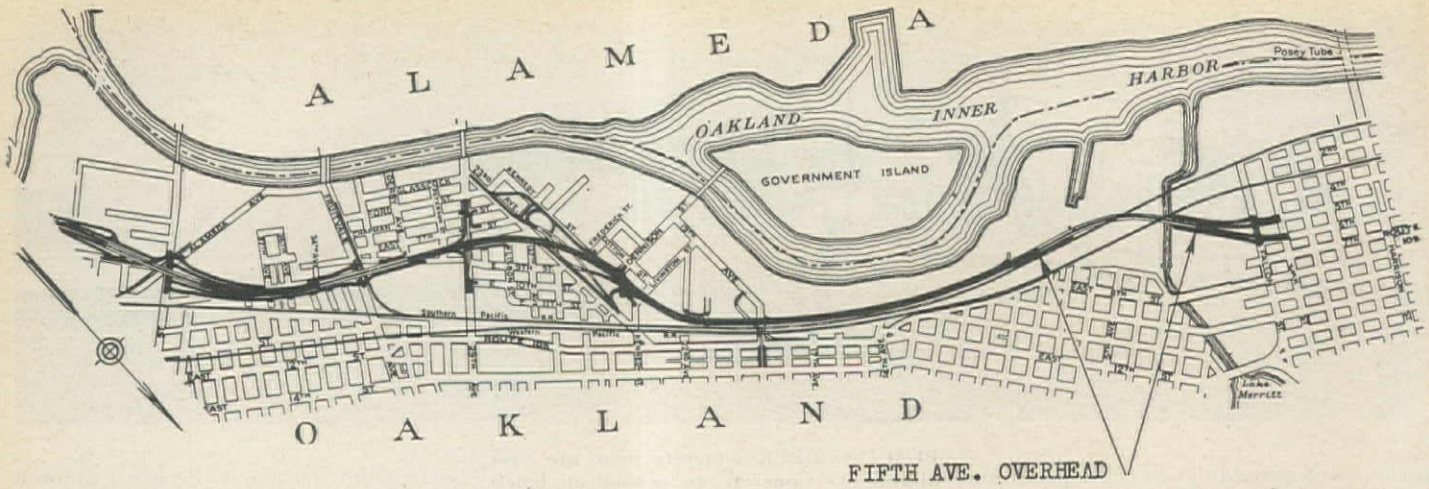
The concrete is taken from the trucks into a crane concrete bucket and then either placed directly in forms or, in laying the deck, swung up and placed in a buggy for placing in forms. A 1½-cu. yd. crane is used for concrete placing. Cotton mats supplied by the state are used for curing the deck concrete. The concrete is first sprinkled with water, and the dampened cotton-batting quilts are left in place for at least 8 days.

With the continual variation in the forms due to superelevation and the roadway curves, no two haunch fillers were alike. To avoid the great amount of measuring and computation involved for sawing each individual filler, Jim Butler, engineer for Stolte, Inc., one of the joint contractors, devised a slide rule which automatically determined the angle relationship between adjacent haunch fillers. A sliding brass sheet was placed over a calibrated sheet so that the linear depth on one side could be set simultaneously with the opposite lineal depth, solving the problem somewhat as a nomograph does. Cardboard templates were marked in the exact





PRE-SHRUNK CONCRETE batch plant set up 500 ft. east of the structure, top. Fleet of five 4-cu. yd. capacity trucks could deliver 500 cu. yd. dur[illegible].g one shift.



shape of the required form to be used by the sawyer. Precision and a saving of time were the result of this unusual method.

Contractors and personnel

Stolte, Inc., Oakland, and Duncanson-Harrelson Co. of San Francisco have the joint contract for the job. Subcontractors are Soule Steel Co., San Francisco, for small steel work; Ransome Co., Emeryville, track and grade work; Russell-Gerrick Co., San Francisco, for placing the large structural steel; and the Del Monte Electric Co., Oakland, for the deck wiring.

George "Buck" Fink, a Duncanson-Harrelson man, is general superintendent on the job, and Glen Sears is assistant superintendent. Bob Dashiell is job engineer, C. T. Morton, project manager, Reg Phares, office manager, Jim Butler is engineer for Stolte and J. E. Burke is resident engineer for the state.

Freeway plan

The Fifth Avenue Overhead will some day be expected to carry more than 50,000 vehicles daily. It will be but one of fifteen structures planned to eliminate cross traffic between Webster St., Oakland, and San Leandro. The entire Freeway plan is an elaborate answer to the growing traffic problems of this area. It is being designed to facilitate movement to and from the Bay region for the industrial and agricultural production of the state as well as to solve current traffic snarls.

The Freeway will eventually extend from the Carquinez Bridge northeast of Richmond a distance of 70 mi. to San Jose where it will join with the Bayshore Freeway from San Francisco. Of the fifteen structures planned for the Oakland portion of the Freeway, contracts have been let to date for a third of the work, and other contracts will be awarded in 1948 for structures now still in the planning stage.

Incorporating the present Eastshore highway as part of the high-speed Freeway, that part of the Freeway from Oakland south which must be constructed begins from the distribution ramps of the Bay Bridge. From there, it will roughly parallel the Bay as it passes through San Leandro, Hayward, and Warmsprings to connect with the Bayshore Freeway at 10th St. in San Jose.

Other major structures

Major structures in Oakland for which contracts have been awarded other than the Fifth Ave. Overhead are for the substructure and superstructure of a 1,410-ft. crossing at Fruitvale Ave., and for the overpasses at 19th Street and 23rd Street. The substructure for the bridge at Fruitvale Ave. is now completed under a $387,000 contract, and work on the $646,000 contract for the superstructure will proceed as soon as the steel for reinforcing the concrete deck becomes available. S. J. Amoroso Construction Co. of San Francisco completed the contract for the substructure, and J. H. Pomeroy & Co., San Francisco, have the contract for the superstructure.

An overpass at 23rd Street is being constructed by A. Soda & Son, Oakland, under a $468,000 contract. It will be 503 ft. in length and will elevate the heavy cross traffic on 23rd Street above the Freeway. The contract for the 863-ft. bridge which will lift 19th Avenue above the Freeway has been let to Carl N. Swenson Co., San Jose, on a bid of $354,000 and construction is just beginning. This crossing also presented a problem in design as it must curve to cross the Freeway and also parallel railroad tracks.

The Freeway will continue on to pass under 28th Avenue, which will cross the main route on a 609-ft. bridge on which construction has already been started by the Lew Jones Construction Co., San Jose. This project, costing $156,000, is now about one-third complete.

Still in the planning stage is the Webster St. undercrossing which will divert traffic from the Alameda tube. This will be a 1,370-ft. bridge extending between Fifth and Sixth Streets. It will span Franklin Street, the Webster Street approach to the planned new tube under the Estuary to Alameda, the Harrison Street outlet from the Posey tube, and Alice Street.

Another important structure will be the High Street bridge at Alameda Ave., a span of 3,476 ft. which will carry the six-lane Freeway across railroads as well as the street. The greatest concentration of Freeway traffic is expected at High Street. State engineers have devised an intricate interchange system at the north

(Continued on page 88)

KEY PERSONNEL at the Fifth Ave. Overhead are, l. to r., BOB DASHIELL, job engineer, GEORGE "BUCK" FINK, general superintendent, and C. T. MORTON, project manager.

Asphaltic Concrete Canal Lining Studied on Pasco Lateral System

Major portion of experimental construction at Pasco, Wash., is of asphaltic concrete, representing great departure from previous lining design and construction methods—Equipment utilized includes specially designed lightweight paver shaped to fit canal bottom

By JEWELL R. BENSON
Bituminous Engineer,
Bureau of Reclamation
Denver, Colorado

THE RECENT construction of approximately eighteen miles of canal lining on the Pasco lateral system of the Columbia Basin Project in Washington by the Bureau of Reclamation includes Portland cement concrete, pneumatically applied mortar and asphaltic linings. The purpose of the construction of these various types of linings was to study the basic costs, methods of construction and service performance of the several types of lining in connection with the Bureau's current program of development of lower-cost canal linings. A general review of canal lining construction on the Pasco Lateral System has been given in a previous article, "Experimental Canal Linings," (*Western Construction News*, September, 1947.)

The lining construction on the Pasco system included 3 mi. of 2-in. and 3-in. thick unreinforced concrete, 3½ mi. of 1½-in. and 2-in. thick pneumatically applied mortar, and approximately 11 mi. of asphaltic concrete. In addition to these linings, one short section of canal was lined with an experimental asphaltic prime-membrane lining. No reinforcing was used in any of these linings. The concrete types were cured with Techkote membrane curing process. The asphaltic linings used in the Pasco system constituted the major portion of the lining construction and represent the greatest departure from previous Bureau large-scale lining construction.

The asphaltic concrete linings were constructed under Bureau of Reclamation Specification No. 1230. The contractor for the project was the J. A. Terteling Co. of Boise, Ida. William Foss was the general superintendent, and A. L. Perry, the project superintendent for the Terteling Co. Charles W. Seeholzer was resident engineer for the Bureau, and Albert Harrison was chief inspector.

Design of asphaltic lining

The asphaltic-lined canals varied in size from 5-ft. bottom widths to 2-ft. bottom widths and from 3.7-ft. to 0.5-ft. water depths. The inverts at the bottom of the lining were constructed with 18-in. radii, and the 8-in. width of berm at the top of the lining was likewise constructed on this radius. All side slopes were 2:1. The designed average water velocity for the asphalt-lined section was 2.85 ft. per sec., the maximum velocity being 6.24 ft. per sec. in one section. One wasteway, constructed on a 20+ per cent grade, will have water velocities greatly exceeding the values noted above, but the wasteway will be subject only to infrequent use.

The design of the asphaltic concrete lined canal sections was based on the use of a Kutter's "n" value of .015. An "n" value of .014 (smoother) was used for concrete, while a value of .016 (rougher) was used for the unbrushed, untroweled gunite lining. The smooth finish obtained on the asphaltic concrete lining may justify the future use of an "n" value of less than .015 for this type of lining. Tests will be made by the Bureau at a later date to determine the actual "n" values of the various surfaces on this project.

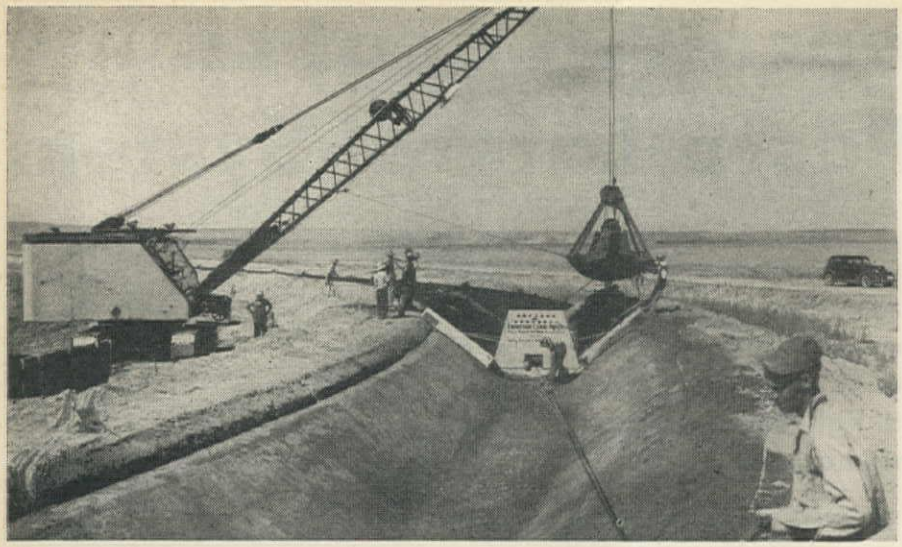
All linings were placed either in compacted soil or in natural cut. To obtain the compacted embankment, the contractor constructed the embankment to full width and to the elevation of the top of the lining. The canal was then excavated by dragline, the excavated soil being used for shoulders of the canal, or the material was placed in berms.

Trimming of the canal sections was accomplished by a rail-mounted trimmer in the 5-ft. and 4-ft. bottom sections, and by a skid-rig operating on 2 x 6-in. wooden planks in the 3-ft. bottom sections. The finish trimming on a large proportion of the 2-ft. bottom sections was performed by hand.

Soil treatment details

Soil sterilization treatments were applied to approximately 18,000 lin. ft. or 25,000 sq. yd. of the Pasco lateral system. The soil sterilization treatment consisted

PAVING PROCEDURE on Pasco laterals. Top, skid-rig trimmer for small laterals; center, paver lifted over ditch checks was easy, due to light weight; bottom, completed section of main pump lateral, having 5-ft. designed bottom width.



PAVING around a curve on a 5-ft. bottom lateral. Winch cable in foreground is anchored to a deadman. Asphalt was transferred from trucks to paver by clamshell.

of the application, in aqueous solution, of either sodium chlorate or a mixture of five parts boric acid to one part of chlorate. Approximately 5,600 sq. yd. of the main canal were treated with the sodium chlorate solution, half of the area being treated at the rate of four ounces (of dry material) per sq. yd., and half at the rate of eight ounces per sq. yd. Boric acid-chlorate mixture was applied in solution at the rate of eight ounces (of dry material) per sq. yd. to all of the remaining 19,460 sq. yd. of treated canal and lateral area with the exception of 2,700 sq. yd. which were treated at the rate of four ounces per sq. yd. While the treated subgrade areas will serve as controls, it is expected that little weed growth will occur in the untreated areas due to the inhibition of weed seed germination in compacted earth, the increased resistance to weed penetration of the low penetration asphalt cement used in the asphaltic concrete, and to the indicated very low existing weed seed contamination of the subgrade soils in the Pasco laterals.

Paving equipment

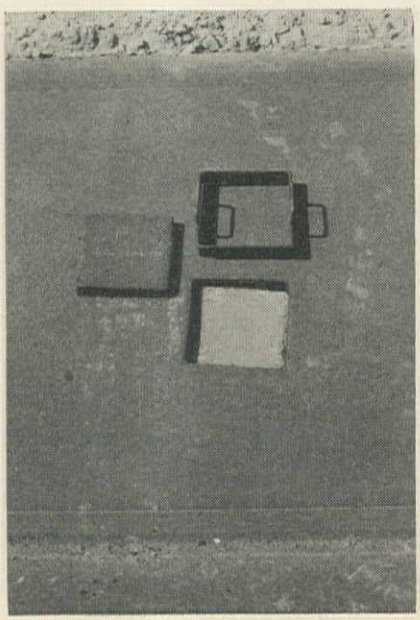
All asphaltic concrete lining, with the exception of hand-placed areas around structures and turns up to 60 deg., was placed with equipment manufactured by the Madsen Iron Works of Huntington Park, Calif. The Madsen canal paver was originally designed by E. O. Ekenstam of the Southwest Paving Co., Roscoe, Calif.

The Madsen paver, as furnished to the contractor by the manufacturer, consisted of an 8-ft. long forward pan, shaped to fit the bottom of the canal and extending up the sides for approximately 1 ft., this pan acting as a stabilizer and a control surface for the rear screeding-ironing section. The forward pan mounted a small 4-cylinder engine and a cable winch. The engine and winch, through a half-inch cable anchored some distance ahead of the paver (a tractor was used as a deadman) pulled the paver forward at speeds varying from 3½ ft. per min. on an empty winch drum to about 5 ft. per min. on a full drum. Connected to the forward pan by two pair of arms, was the rear assembly consisting of a strike-off and moldboard, pressure irons and a roller system. The arms connecting the rear assembly to the forward pan were so arranged by rigid, hinged and adjustable connections, that the entire rear assembly could be raised and lowered to control lining thicknesses. After loading the rear screed to obtain proper densities and finish, some changes in the method of controlling lining thicknesses were necessary.

Control of thickness

After beginning the lining operations, it was found that the rollers provided on the paver for compaction produced only very moderate increases in density over that obtained by the ironing screeds alone, and furthermore, they were creating an undesirable surface checking condition. The side rollers were therefore removed on the third day of lining operations, and the bottom roller was removed a short time later. Better thickness control, surface finish and density were obtained by loading the rear screed with from 3,500 to 4,000 lb. of bagged sand, the ironing screeds assuming the load. It was found that the strike-off and ironing screeds required meticulous adjustment in order to obtain adequate thickness control and the desired nicety surface finish.

LINING SAMPLES for thickness and density were secured by pressing template into hot surface and removing cut plug after the lining had cooled, thus eliminating much labor with hand tools.



Under normal conditions, the thickness of the lining was controlled to within a plus or minus ⅛ in. The use of a mix designed for a high workability and having a fairly high asphalt content contributed greatly to the ability to control the thickness, surface finish and density of the lining by the paving means used. Extensive laboratory tests prior to construction indicated that a high resistance to high temperature creep would be obtained in the completed lining in addition to a high degree of workability of the mix under construction conditions. Densities in the completed lining averaged approximately 92 per cent of the standard laboratory density. Ninety per cent of this density constituted the specification minimum requirement.

The original Madsen machine was constructed to pave only a 5-ft. bottom width canal section. For the 4-ft. and 3-ft. bottom width sections, the contractor remodeled the 5-ft. machine by successively removing 1-ft. widths from the pan and rear screed sections. These operations were performed by the expert use of acetylene-oxygen cutting equipment and arc welding. A minimum of lost time resulted from such remodeling activities as this work was generally performed, whenever possible, at night. A new pan and screed provided by the Madsen Co. was used on the 2-ft. width canals. The simplicity and light weight of the Madsen machine was of great advantage where concrete structures were encountered since the entire machine could be lifted over the structure by a line from the clamshell boom.

Paving operations

A Madsen 2,000-lb. batch plant was used for mixing the asphaltic concrete. A 2-bin separation was used for aggregate control, while fines, consisting of a fine silt obtained from a local dry deposit, were proportioned from a third bin. The plant was equipped with a Madsen dryer fed by a reciprocating feed from the aggregate stockpile. The hot mix was hauled to the site of paving operations in 5-ton flatbed trucks. Paving operations were generally within a 5-mi. radius of the mixing plant at all times so that no particular difficulty was encountered due to heat losses in the mix during transportation. The mix was generally delivered to the paver at from 300 to 325 deg. F. The hot mix was dumped into a steel-lined box mounted on skids and pulled by a tractor ahead of the clamshell. The hot mix was taken from the dump box and placed in the canal paver by means of a ¾-cu. yd. clamshell. The dump box was pulled ahead of the clamshell permitting for-

ward swings of the clamshell, which prevented droppings from the clam from falling on finished lining surfaces. By skillful operation of the clamshell, the hot mix could be distributed in front of the strike-off and moldboard in such manner that practically no hand labor was required for mix manipulation in the paver. Two laborers were stationed at the upper end of the rear screeds to maintain mix in the corners for the berm. Even here, little manual effort was required.

The normal crew at the lining site consisted of one foreman, one dragline operator, one oiler and dump-man, one cat operator, one labor foreman, and three laborers. A crew of five was employed part time in patching sample holes, hand-placing mix around structures, and machine cleanup. In normal operation, no work was required on the lining after passage of the laying machine.

Sand and aggregate

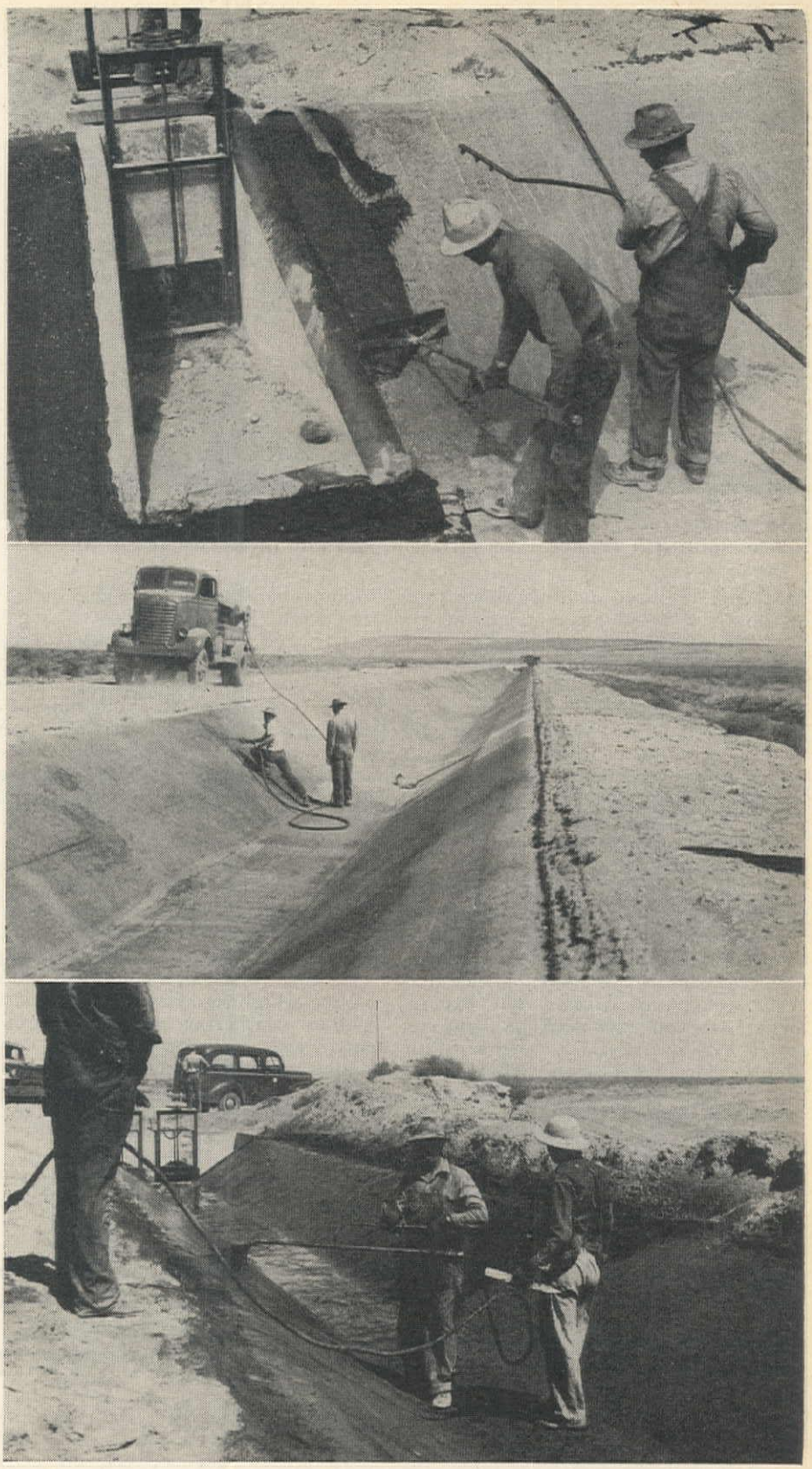
Sand and gravel aggregates for the asphaltic concrete were obtained from wet pits in the Columbia River near Pasco. This material was produced early in 1947 and was stockpiled at the plant site. A small proportion of the coarse gravel was crushed. The specifications for aggregate grading were as follows:

Screen Size	Percent Passing
¾	100
½	80-100
4	65-90
10	55-80
40	15-35
200	5-12

An average of approximately 11 per cent fines passing the No. 200 sieve was maintained during construction. The asphalt content was varied from 8 per cent during the initial construction, to 8½ per cent for the major portion of the work. A 60-70 penetration asphalt cement was used, supplied mainly by the Willbridge, Ore. refinery of the Standard Oil Co. The asphalt was shipped to Pasco in insulated tank cars, and was trucked 13 mi. to the project, where 12,000-gal. storage was provided.

Rate of construction

Paving operations began on May 15 and all lining operations with the exception of minor sealing were completed on July 9. After the first several days of operation, in which construction methods were worked out and a number of changes were made in the Madsen machine, excellent progress was made. The maximum rate of placing lining varied from 1,340 lin. ft., 3,073 sq. yd. and 372 tons of mix placed in eight hours in a 5-ft. canal section to 3,157 lin. ft., 3,662 sq. yd. and 384 tons of mix placed in sixteen hours in a 2-ft. bottom canal. Lining operations were continuous during the day with no shut-downs during lunch periods being taken. This procedure was found necessary to prevent loss of mix due to cooling and to maintain an orderly procedure of work. No serious delays occurred during the work although minor equipment breakdowns frequently occurred.



FINISHING sections of asphaltic-lined canal. Top, hand-placed areas adjacent to structures were sealed by handspray and squeegee; center, cleaning a section of lining preparatory to sealing with 50-60 penetration asphalt cement—air-blast was necessary to remove fine sand and dust in this area which had been badly scuffed during initial operation of paver; bottom, membrane-type lining (see picture on next page).

Sealing of the entire asphaltic lining surface was originally proposed. However, due to the smooth finish and indicated high degree of impermeability obtained by the slip-form operation, the sealing of the entire surface was concluded to be unnecessary. In lieu of the complete sealing, sealing was performed only on unduly rough areas such as those encountered in the hand-placed areas adjacent to structures, the lining in the first 1,000 lin. ft. of operation where roller action and adjustment had caused difficulties, and in small scuffed areas. A 50-60 semi-blown asphalt cement was used for sealing. The sealing

CONSTRUCTION of test section of prime-membrane type lining; diatomaceous earth is being sprayed at 425 deg. F. on surface primed with Diesel fuel and RC-O.

procedure required careful preparation of the asphaltic lining by removing all dirt and dust from the surface. This was accomplished largely by the use of hand brooms and by air blasting. After cleaning, the seal asphalt was applied by a hand spray in the amount of approximately 0.4 gal. per sq. yd. This application was somewhat heavy but was necessitated by the use of hand-spray methods which in turn were required due to the small and irregularly shaped areas which were sealed.

Prime-membrane lining

In addition to the asphaltic concrete lining a section of experimental prime-membrane lining was also constructed in the Pasco pump laterals. The experimental section consisted of approximately 928 lin. ft. of 3-ft. bottom width canal constructed in a compacted fill section of silty soil. The object of the experimental section was to determine the serviceability which might be expected from a shallow prime, prime-membrane type asphaltic lining constructed on a firm stable subgrade. One 328-ft. section of the canal was treated with 8 oz. of sodium chlorate applied in aqueous solution, while the remaining 600 ft. of canal was treated with approximately 0.5 gal. per sq. yd. of Diesel oil. This material served both as a sterilant and a pre-prime application. An application of 0.5 gal. per sq. yd. RC-O was then applied in two applications to the entire area and allowed to penetrate. After reaching a surface-dry condition, a membrane consisting of a mixture of 80 per cent 60-70 penetration steam refined asphalt and 20 per cent of diatomaceous earth was applied. The filled material was applied by hand spray at a temperature of approximately 425 deg. F., and at a rate of about 0.6 gal. per sq. yd. to 0.75 gal. per sq. yd. This formed a thick tough membrane having a high resistance to water action and to weathering. A 28-ft. length of canal, after priming with RC-O, was coated with membranes of catalytically blown unfilled asphalt and several special asphaltic sealing materials. The behavior of the experimental installation of prime membrane lining will be observed in connection with its possible use as a very low cost, easily constructed asphaltic lining.

Winners Named in $200,000 Arc Welding Contest Program

THE TRUSTEES of the James F. Lincoln Arc Welding Foundation have announced the awards in its $200,000 contest program for papers on the application and advance of arc welding techniques. The 467 awards ranged from $100 for honorable mention to $13,200 for the main award.

The first main award of $13,200 was for a paper describing how welded design of a variable pitch propellor for light planes overcame problems presented by low cost manufacturing and strength requirements. The paper, entered under the aircraft classification, was prepared by three of the personnel of the Koppers Co., Baltimore, Md.

Kiser E. Dumbauld, design engineer of the Bureau of Bridges of the Ohio State Highway Dept., received the second main award of $10,700 for a paper entered under the structural building and bridges classification. His subject was the redesign to welded construction of three of Ohio's riveted plate girder bridges. The paper treated all phases of work in great detail and compared the value of the two types of construction.

G. J. Storatz, engineer for the Heil Co., Milwaukee, Wis., was awarded the third main prize of $8,200 for his paper entered under the industry machinery classification. He described the redesign to welded construction of the company's Trailbuilder. Included in the paper was a complete breakdown of cost and weights for the cast and welded design for each major assembly and a final comparison summary.

G. W. Smith and C. H. Darby, bridge engineers with the California Division of Highways, were awarded $1,250 for a paper on which they collaborated. It covered the design and construction of three proposed types of highway bridges especially adapted to desert conditions and included a cost comparison.

The Arc Welding Foundation will publish books and technical articles abstracted from the papers to make available the information accumulated under the award program.

Santa Barbara Proposes Reservoir on Santa Ynez

THE CITY WATER Commission of Santa Barbara, Calif., has recommended to the City Council that Santa Barbara enter into a $12,000,000, 50-yr. water contract with the County of Santa Barbara and the Bureau of Reclamation. A joint meeting is planned, and if the Council approves the resolution, the program will be submitted to a vote of the people.

The resolution states: The Water Commission unanimously recommends that the City Council contract with the county water agency for a minimum of 3,300 ac. ft. of water per year upon the completion of a 210,000-ac. ft. capacity reservoir on the Santa Ynez River and appurtenant works at a site to be selected by the Bureau of Reclamation, and said amount of contracted water to be progressively increased to a minimum of 10,500 ac. ft. in the 37th year after completion of said project. Payment for said water shall be upon a contract at the rate of $35 per ac. ft.

Commissioners said the co-operative plan would provide the city an ample water supply, probably for a century, as well as providing irrigation water for the Santa Ynez Valley, and ample supplies for Goleta, Carpinteria, and Montecito. It was indicated that these districts were in agreement with the plan.

Gross annual income of the city water department now is approx. $600,000. The revenue will climb with the population, but officials doubted that the project can proceed without higher water rates or a tax levy.

OREGON HIGHWAY Users Conference has been reactivated in the state to work out a suggested program for construction and maintenance of the state highway system. Directors of the group are presently engaged in studying the ten-year California highway program with the view in mind of developing a similar plan for Oregon. The conference expects to submit such a plan sometime next year to the legislature interim committee established at the last session of the state legislature to recommend a highway program to include construction, maintenance, and financing. Ray Conway is president of the conference.

Sacramento Freeway Opened

Motorists of California's capitol city find new freedom on modern 4.8-mi. freeway — Grade separations and braided junctions are a tribute to the planning acumen of state engineers—Headaches were caused by steel shortages and threats from irate land-owners to bomb the property fence

By CLYDE J. GORMAN
Sacramento, Calif.

THE NORTH Sacramento Freeway has been opened long enough for law enforcement officers to snag one drunken driver.

Despite one straight-away section that crosses Deadman Slough, no one has wound up in the treacherous tules, though for the first few weeks it has been touch and go.

According to Arthur Elliott, resident engineer for the State, "People will have to become accustomed to the freeway."

The new freedom!

You see, this is the first taste for many a local motorist of a four-lane highball highway. After crouching together on the old two and three lane, stop-lighted, and restricted approach to town, they are lost and a bit addled by all the room, the braided junctions, and the sweeping grade separations. The "Sacramento Bee" in hailing this metropolitan touch admitted, however, that some drivers tried to go west in east-bound lanes.

It isn't that these people don't need a freeway — an average 16-hour traffic count shows 30,026 vehicles at the tie-in below North Sacramento—but it illustrates something that doesn't show up in the plans and specs when the pressure is suddenly released from a bulging rural traffic artery. The State Police showed good foresight and further demonstrated the wisdom of keeping fast new sections well patrolled until the emancipated motorists learn how to handle their new freedom. This is the logical follow-up when highway engineers break camp and move on.

THE WEST END of the freeway as it curves gracefully around the outskirts of North Sacramento. Construction activity in foreground is at the junction with U. S. 40. Marconi Ave. overcrossing is seen at left.
Sacramento Bee Photo.

Yet, while the highway engineers have moved on, it might be well to step behind the grand opening and see what they did. Here, after all, is the story.

Advance design

The North Sacramento Freeway entered the design stage some seven years ago. The fact that the road and structures are as modern as 1960, or whatever date anyone can see from here—well, it's a tribute to the designers. Very little modification was found necessary to match the latest concepts. The State's designers insist they are not that good and point to changes at entrance and egress points not thought necessary seven years ago. But prospective traffic as California fills out has raised the sights.

Another instance of thinking ahead is two overpass structures that end abruptly in a pasture. For the time being they serve as avenues for traffic from the North Sacramento side, but someday people will be living with abutting barbecue pits on both sides of the Freeway. In fact, in its 4.8 mi. of length, cross traffic has six opportunities to go over or under the freeway. The planning did not cut an area in half.

Acts of God, etc.!

Other reviews of California's postwar construction program have made a point of this advance planning which nicely

takes advantage of the current federal-aid program. On this job, getting started early caused something of a rub. Delivery of materials, steel in particular, caused delays that were no fault of the contractor, Guy F. Atkinson Co., despite occasional gripes from local citizens who could see a long slab of inviting concrete with no chance to drive on it. In some instances, even after the steel left the rolling mills for shipment via water to the West Coast, it was fouled up at sea by maritime strikes. Simply allowing for Acts of God was not enough, and main construction dragged from early 1946 to October 6, 1947—nearly two years.

Actual construction time however, was favorable enough, and in no small part due to the minimizing of hand labor. The road was so designed that earthmoving machinery could handle every phase including dressing of the finished job. (I remember working on roads to nowhere in the '30's where heavy equipment stood idle in order to spread out the work.) Another, though minor cost of delay, was a few boils resulting from the unrestricted movement of concrete poured and waiting for connection to the structures. These spots were cut out and resurfaced. (See photo.)

A typical cross-section shows two 12-ft. lanes in each direction of eight-inch (uniform thickness) unreinforced concrete, a two-foot paved shoulder inside, and a three-foot paved shoulder outside. Beyond the paved surfaces, a varying width of oil penetration treatment is used.

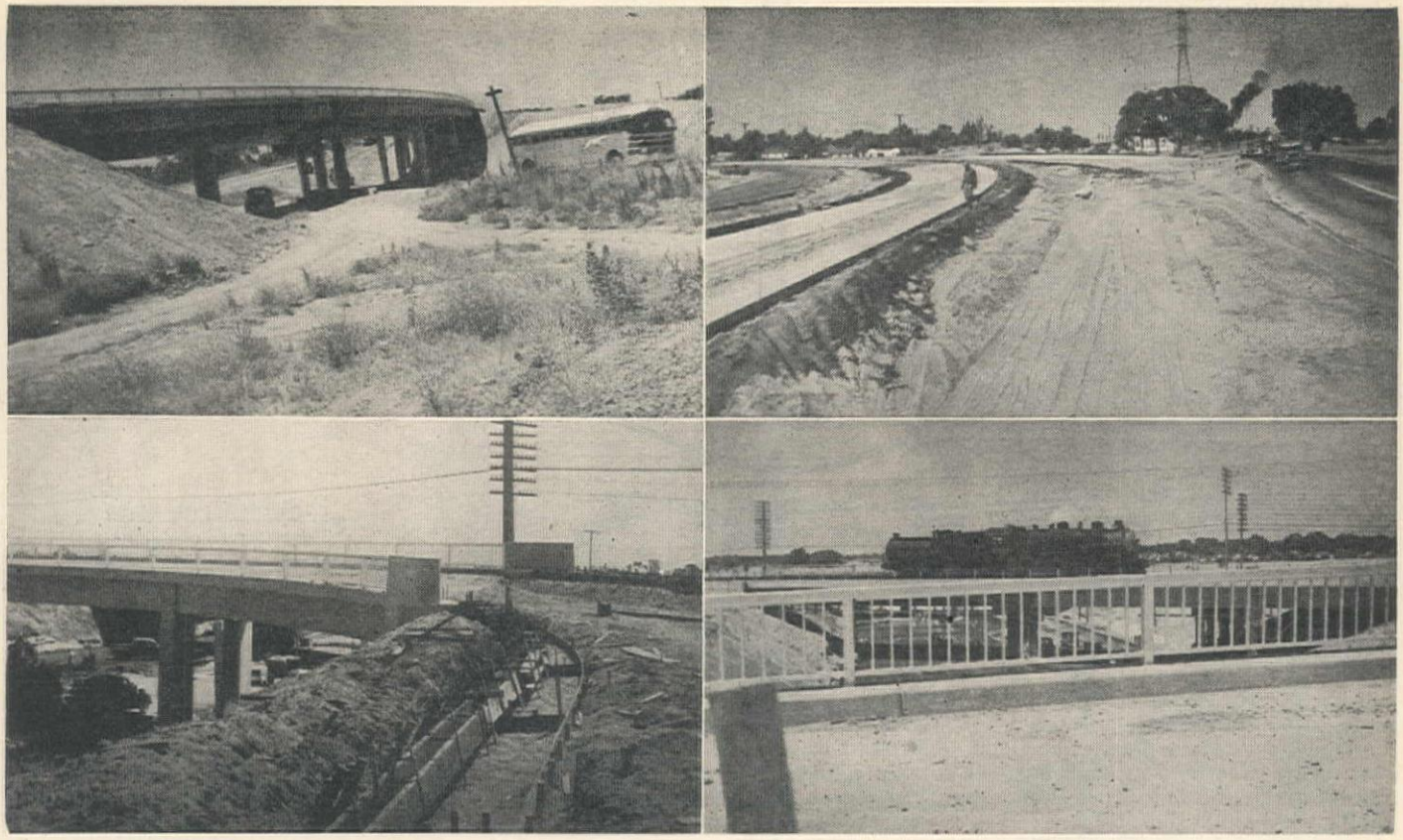
Typical cross-sections

As to the subgrade, there is a minimum of 13 in. and a maximum of 16 in. of imported borrow, depending on underlying soil characteristics. The top four inches is bituminous treated. There were no special problems in the low-lying areas. In fact, hardpan was found at the grass roots in many places and it required a lot of shooting even for minor excavations. The borrow came from sand on the banks of the nearby American River at a State-selected site. When the contractor was stuck for something else to do, he stockpiled treated borrow on the right-of-way midpoint of the job.

Other typical measurements show a minimum of 30 ft. between inside edges of the pavement or opposing traffic lanes. The width of the right-of-way is 160 ft.

In underpass sections it is noted that the pavement is lighter in color. Asked about this, State construction man Earl Withycombe, said it was a difference in curing. Some experiments were made with pigmented curing rather than the usual black method. Noting the success of these test sections, Withycombe sug-

SLOPE DRESSING, top, was accomplished despite steep grades (power pole vertical) by tying two tractors together to work as a team. Next, loading stockpiled bituminous-treated material for top 4 in. of subgrade, and a Traxcavator eats up visual obstruction near the El Camino Ave. overcrossing. Left, during construction period, there were really five lanes. Soft divider strip was ideal for equestrian traffic.



gested that pigmented curing would meet with favor on future jobs. It seems a foregone conclusion that motorists prefer a lighter surface, especially for night driving. These motorists also appreciate the excellent traction afforded by slight striations—the imprint of burlap dragged in curing operations.

Except for the railroad bridge (a Southern Pacific crossing), which is steel plate and girder throughout, all eight structures are of reinforced concrete, hollow-box type. All have trim steel railings. In each case, short multiple-arched crossings are used to avoid increased elevation, essential to longer spans. The result, to the man-behind-the-wheel, is a long, nearly flat stretch with the ultimate in visibility. On no structure is there any provision for pedestrians, which — judging from stout right-of-way fences—is precisely what the designers had in mind.

No cows, no kids!

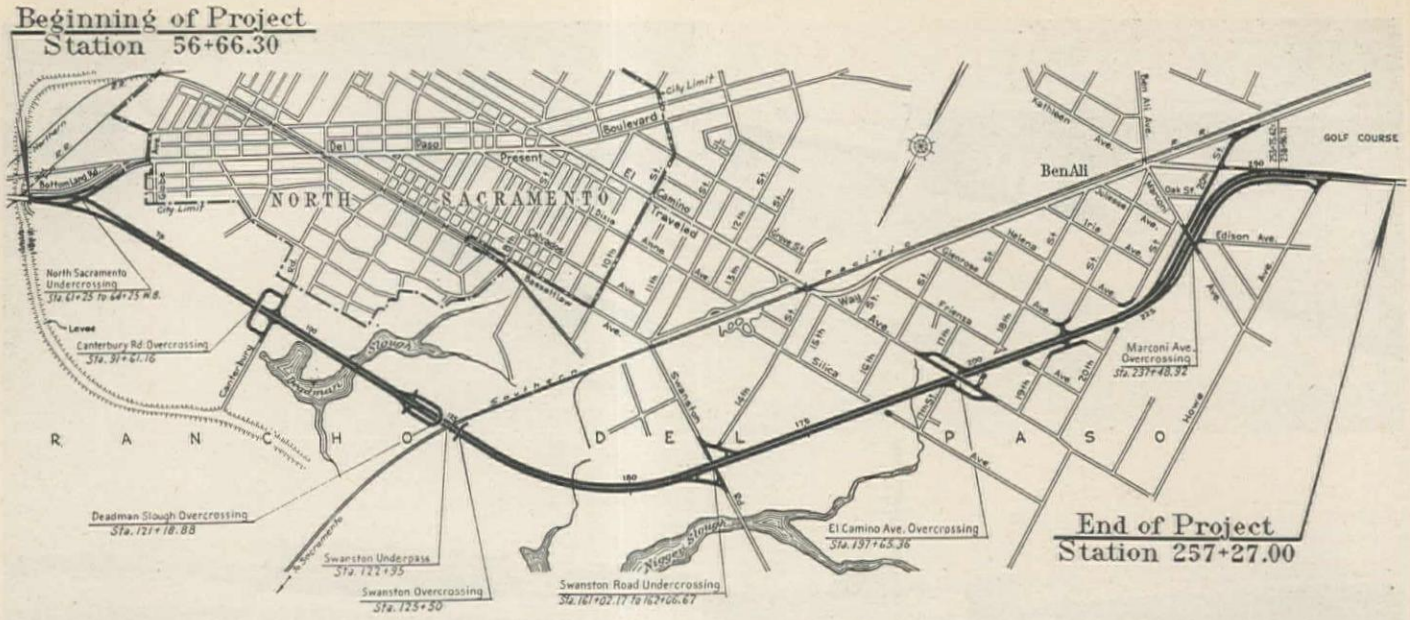
Speaking of fencing, a chain link fence, as formidable as a prisoner-of-war confiner, is used in developed areas and at strategic points between opposing lanes where there would be a temptation to cross. In other areas a strong property fence, to resist cows and kids, is in place.

At this point it may be a comfort for others, who propose to fence off fast roads, to know that the North Sacramento Freeway was not without its headaches. Even while the interview for this story was taking place, a disconsolate motel owner phoned up to announce he contemplated bombing the fence. It happens that a sizeable group of newly-built auto courts along the old U. S. 40 route were cut off from direct access. Some were by-passed entirely. The owners have erected a huge sign at the south turn-off to inform travelers of the bleak stretch ahead, with appeals to take the old road. When strides are taken to make U. S. 40 an express highway, the howls will be even louder. The most probable answer was observed by the writer in a recent trip to Phoenix, Ariz. Here, Van Buren Ave., off the path for many travelers, is none-the-less known as motel row. If anyone is searching quarters for car and family they go out Van Buren, pays their money, and takes their choice. Motel and highway market builders of days to come will doubtless have to figure some such publicized location instead of eyeing highways of the future. Otherwise, there would be no point in building freeways.

THE NORTH Sacramento Viaduct where the new Freeway begins, top left. Earth grade above bus supports local traffic joining inbound vehicles. Top right, tie-in at upper end with U. S. 40 and 99-E allows only west-bound traffic to peel off. Bottom left, work near one of the hollow-box type overcrossings, and right, a Southern Pacific engine tries out the steel girder bridge. Below, pavement chipped away to correct concrete boil shows thickness and type of paving.

Getting back to today's stretch of future highway that we are talking about, everything is done but the landscaping, or as some call it, beautification. The first task here will be to grow anything that will hold the soil. The contract is being readied that will accomplish this and initiate more permanent and pleasing vegetation. When the highway was built, sufficient pipes and hydrants were laid to take care of watering. In this connection, wells dug for water supply during construction will continue in permanent service to keep the beautification green. These wells (see photo) are ten inches in diameter, deep, and with a capacity of 200 g.p.m. located at two well-spaced points along the route. Even the Freeway's topsoil has been stockpiled to aid the program.

Despite its lowland location inside a bend of the American River, the new route is protected by an existing levee. Part of the haste in making a fall closure



to the regular route was to get traffic back on the viaduct that traverses the overflow channel between Sacramento and the North city. While making the tie-in, in-bound traffic had to use a bottomland road that is flooded in moderately heavy weather. In depressed sections of the Freeway proper, sump pumps will handle run-off water.

Cost of the job is $1,850,000. This represents construction only. Add right-of-way costs, etc., which were quite reasonable, and the job is in the vicinity of $2,000,000.

Future extension

Now that the North Sacramento Freeway is completed, the next bite in the move eastward, eventually to the State line, is a continuation of a trail with like specifications. This extension will clip 1.1 mi. off the present route to **and around** Roseville. The cost of right-of-way along the existing two-lane and dangerous highway is so expensive as to warrant a complete new routing through open country. Since the war, roadside operators have moved in like a picket fence along the whole road to Roseville, causing what the experts call "marginal and intersectional friction." Whatever it is, it surely annoys the through motorist, and has raised the accident rate one and one-half times above the average for the State.

Be that as it may, long before the proposed extension is completed, it is expected that local drivers now have enough room for practice so that they can take the rural turnpikes of tomorrow like San Franciscans take the Bay Bridge.

WELLS SUPPLYING 200 gpm. were dug to supply water during construction and will keep landscaping green. This one is on right-of-way near the Marconi overcrossing.

Road Builders May Open New Branch in the West

LOOKING FORWARD to the possible opening of a Western branch with headquarters in San Francisco, the American Road Builders' Association have retained Floyd O. Booe of San Francisco to conduct a two-months' survey of the eleven Western states. If the study reveals a necessity for establishment of the branch, steps will be taken to organize personnel in the Western highway construction field into a Western Association. The proposed association would be autonomous to some extent but would operate closely as a unit of ARBA in matters of policy and administration.

Booe, who will carry on the survey and report results at the ARBA Highway Conference to be held in Washington January 26-28, has already set up temporary headquarters in San Francisco. He has a wide acquaintance among road builders and highway officials in the Western states, having been manager of the Northern California chapter of Associated General Contractors for twenty years and secretary of the Nevada Highway Commission for ten years.

A statement by Charles M. Upham, engineer-director of ARBA, spotlights the reasoning which instigated the decision to make a survey. "We believe the time is ripe for extending our activities into the western part of the nation because of increasing membership and interest in this area. The Pacific coast and mountain states, with their remarkable postwar development and extensive highway programs, should have the services and advantages of membership in this association."

New Machine Packs Sand for Heavy Building Foundations

HEAVY CONSTRUCTION is now possible on sand, it was announced recently, with the introduction of a new machine using powerful vibrations and jets of water to pack loose sand or soil into a firm foundation.

Designated a "vibroflation" machine, it weighs 2,500 lb., is powered by a special General Electric motor, and can be attached to standard types of construction cranes, it was reported. Originally built and tried in Europe, the first American machine, which resembles a large streamlined rocket or missile with an electric motor and vibrating unit assembled in the head, was constructed by the Baldwin Locomotive Works, Eddystone, Pa. It was developed and tested by Parsons, Brinckerhoff, Hogan & Macdonald, consulting engineers, N. Y., and Merritt, Chapman & Scott, general contractors.

A shaft with an unbalanced weight is used to produce a centrifugal force of 20,000 lb. This unbalanced weight carried by two anti-friction bearings, revolves at 1,800 r.p.m., thus setting up the necessary vibrations. Soil of an area 100 sq. ft. to any required depth up to 100 ft. at each application can be packed by the cylindrical unit into a solid mass which could support building foundations, water-retaining dams and heavy airport runways.

Construction Design Chart

LXL... Stiffness Factor for Concrete Columns

THE CHART presented in June, 1947, was for the determination of stiffness factors for reinforced concrete T-beams in the analysis of building frames by the method of distributed moments. The accompanying chart is for determination of the same information in reinforced concrete columns.

The analysis of a statically indeterminate structure is theoretically impossible until the size of all members has been determined. Since the size of members cannot be determined until the stress is known, it is necessary to make approximations of beam and column sizes before making an analysis. Refinements are then made by adjusting the size of members and repeating the analysis if necessary due to large changes. The process might be continued to the point that the design cost would become excessive. Slight changes in member sizes actually make little difference in the ultimate balancing of the moments. The recommendations of the A.C.I. Code and Joint Committee Report, to omit the effect of the reinforcing in computing the stiffness of reinforced concrete members is therefore reasonable. This approximation becomes still more reasonable when we consider the questionable accuracy of prognostications concerning the effect of reinforcing in a composite member.

The accompanying chart, like the one in June is based on the gross section of the concrete, neglecting the effect of the reinforcement. Some building codes still require that allowance be made for the effect of reinforcement in concrete columns. In such cases, it is recommended[1] that the values of K based on only the gross section of concrete be increased 10%.

Table IV of reference 1, gives values of

$$K = \frac{I}{10h}$$ for rectangular concrete columns

of various size and height. As described on page 195, the divisor (10) is used for simplification. On the accompanying chart, the same results are given without the trouble of interpolation. Furthermore, provision has been made on the chart for both square and circular column sections. The values are based on

$$I = \frac{b^4}{12}$$ for square columns

$$I = \frac{\pi D^4}{64}$$ for circular columns.

A single straight line intersecting all scales, is necessary for a solution of the chart. I have drawn a solution line on the chart for a 14-in. square column 16 ft. high. The chart, as will be noted, gives a value of

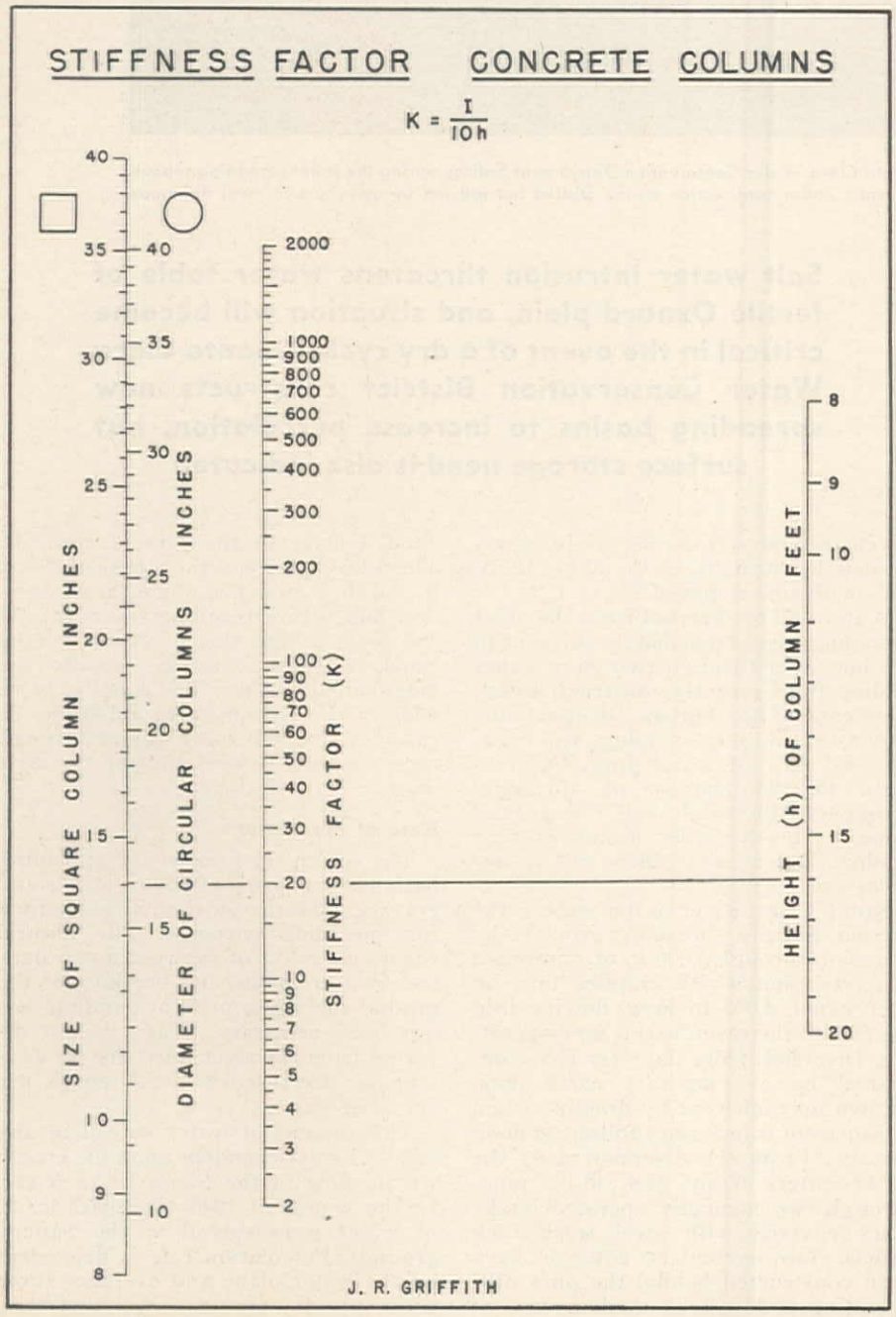
$$K = 20$$

Table IV of reference 1, gives a value of $K = 20$ for the same conditions. By substitution in the equation, we would have the following:

$$K = \frac{I}{10h} = \frac{b^4}{10 \times 12 \times h} = \frac{14^4}{10 \times 12 \times 16} = 20.02$$

On the chart, it will be noted that the stiffness of a 16-in. circular column is almost the same as a 14-in. square column. Thus for the same height, a 16-in. circular column would have a stiffness factor of

$$K = \frac{\pi (16)^4}{10 \times 64 \times 16} = 20.3$$



[1] *Continuity in Concrete Building Frames*, 3rd Edition, Portland Cement Association.

Federal Highway U. S. 10 Alt. Will Now Be U. S. 2

THE HIGHWAY ROUTE between Spokane and Everett, Wash., which has for many years been designated as U. S. 10 Alternate, will be redesignated U. S. 2 to provide the northernmost federal aid highway in the United States with an extension to Puget Sound. Under the present system U. S. 2 extended as far west as Bonners Ferry, Idaho, where it apparently came to an end. Last month erection of new markers began which will place U. S. 2 signs from Bonners Ferry through Sand Point, Idaho, to Newport, Wash., thence to Spokane, Davenport, Wenatchee, over Stevens Pass, and to Everett.

Ventura County Ground Water Lowers

EXISTING SPREADING BASIN of the Santa Clara Water Conservation District near Saticoy during the water spreading season. An 87-acre extension to this basin is currently under construction by the District but will not be adequate to meet demands.

Salt water intrusion threatens water table of fertile Oxnard plain, and situation will become critical in the event of a dry cycle—Santa Clara Water Conservation District constructs new spreading basins to increase percolation, but surface storage need is also indicated

THE URGENT NEED for an increased water reclamation program by the Santa Clara Water Conservation District, Ventura County, California, is expressed in a report submitted by Los Angeles consulting engineer, Harold Conkling, and recently released by Vern M. Freeman, engineer for the District. At the present time the District is operating spreading basins at Piru and at Saticoy, and construction began Nov. 3 on an 87-ac. expansion of the Saticoy grounds. The necessity for surface storage to augment these existing operations is indicated by the Conkling report, and in anticipation of such action the Santa Clara Water Conservation District has filed notices of appropriation on the waters of the Sespe and Piru Creeks and the Santa Clara River.

Saticoy spreading ground

Since the operation of the Saticoy spreading grounds began in 1928, 187,700 ac. ft. of water from the Santa Clara River have been diverted to the basins for spreading. The percolation goes to the Montalvo ground water pool and from there moves underground into the pressure area of the Oxnard Plain. Increased needs of the District for underground storage and anticipation of future surface storage on the streams tributary to the Santa Clara River have called for the 87-ac. expansion on leased land adjacent to and south and east of the present Saticoy spreading grounds.

Clearing of walnut trees on the site began Nov. 3, and the new area is expected to be ready for spreading operations in 60 to 90 days. It will be built by the Santa Clara Water Conservation District, under the direction of Vern Freeman, and will consist of 10 basins formed by straight earth dikes, 12 ft. wide with side slopes of 1½ to 1.

Water will be diverted from the older spreading basin immediately adjacent to the new area through two 36-in. pipes leading from recently constructed concrete control box outlets. Identical outlets, with 5 ft. 8 in. openings, will regulate the flow of water from basin to basin in the process of spreading throughout the total area. The ground slope, as in the older basins, is very gradual, and contour dikes will be unnecessary.

Santa Clara River water enters the present Saticoy spreading grounds by diversion through 3,000 ft. of reinforced concrete pipe which empties into an open canal, 3,000 ft. long, flowing into the first of the seven basins now operating. Diversion from the river is accomplished by a temporary earth dam, thrown up each year by dragline when replacement is necessary following flood damage. From the diversion dam, the water enters 60-in. and 48-in. pipes through two manually operated intake gates covered with steel trash rack panels. Two secondary controls have been constructed behind the ones now operating and will be used in case of flood damage to the present controls. The total capacity of the pipes is 140 sec. ft. and their flow is combined at a transition box before reaching the canal. At the point where the water enters the canal, a gaging station records the height of the water. The canal is 14 ft. wide at the bottom, with a 140-sec. ft. capacity, and the water passes through three siphons before entering the first basin.

Rate of percolation

The soil in the area of the spreading basins is composed of porous sands and gravels, and is therefore admirably suited for spreading purposes. The natural vegetative cover of ragweed and volunteer grain remains, and breaking of the ground surface to prevent puddling has not been necessary. Water is not diverted from the river until the silt content has decreased below 20 cu. ft. per ac. ft. of water.

The amount of water spread in any one season is dependent upon the erratic stream flow in the Santa Clara River. In the winter of 1946-47, 22,000 ac. ft. of water were spread at the Saticoy grounds. Percolation rate is dependent on the water plane and averages three ac. ft. per day per acre of wetted area.

PERCOLATION BASIN in operation at the Saticoy spreading grounds, above. Percolation rate averages 3 ac. ft. per day per wetted acre. Diversion canal carrying water from the Santa Clara River to the Saticoy spreading area, below. The water is conveyed partly in the canal and partly in concrete pipe. Headgates and trash grizzlies at the intakes of the 60 and 48-in. pipes, the 60-in. pipe at the right.

Two problems of maintenance are the presence of moss in the late spring and the burrowing of rodents through the levees. Grizzlies over the intakes check the moss, and a 24-hr. watch by crews under the direction of Roy Vest, caretaker, is successfully combating the destructive action of gophers and squirrels.

Piru spreading ground

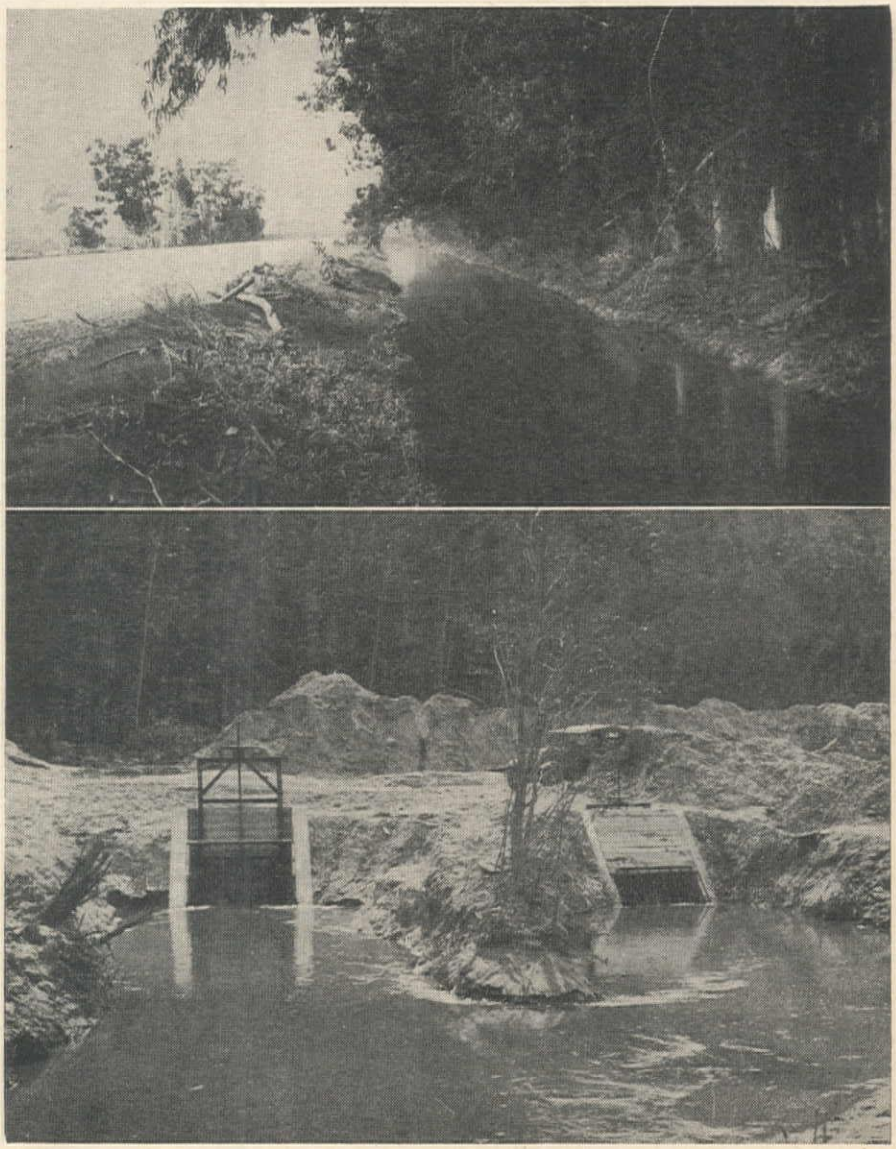
Spreading of water from the Santa Clara River also takes place near the junction of Piru Creek and the Santa Clara River. Earth levees, following ground surface contours, divide the grounds into nine basins throughout which the water is spread after diversion from the river. The total surface area which can be wetted is 43.24 ac. The water is diverted from the river by a temporary rock and sand dam and reaches the first basin through a 48-in. pipe and an open ditch. A 5-ft. Parshall flume, equipped with a water-stage recorder, measures the diverted water. Water enters each basin through an intake in one corner and flows out through an outlet gate in the farthest corner of the same basin. These overpour gates in the levees regulate the flow from basin to basin and skim off the clearer water so that practically clear water is delivered to the lower basins. As in the Saticoy grounds, no water is diverted until the silt content has dropped below 20 cu. ft. per ac. ft. of water.

The water level in Oxnard Plain would be considerably lower than it now is had it not been for the operation of the spreading grounds of the Santa Clara Water Conservation District, the Conkling report stated. The major conclusions reached at the close of the investigation were, however, that these present facilities cannot meet the anticipated needs of the district in an anticipated 14-year drought cycle, and that the present situation in the Oxnard Plain, where the water level is below sea level, is a dangerous one.

Conkling studies

Precipitation cycles of drought and surplus in Southern California have been from 20 to 30 years in length. The discharge of water from Sespe and Piru Creeks, major tributaries of the Santa Clara River, is now being recorded as less than the long time average, suggesting that the drought phase of a new cycle has begun, following the surplus years of 1937-1944. The last drought period was the fourteen years between 1923 and 1936.

Since 1937, during the period of surplus supply, there have been increases in population, industry, and amount of land under irrigation in this part of Ventura County. At the same time, orange and lemon groves have displaced crops needing relatively smaller amounts of water. The Conkling report estimated that demand on the water supply of the Santa Clara River had increased 30,700 ac. ft. over the annual demand as estimated by the State Engineer in 1932. The present annual demand of the Coastal Plain, composed of the Montalvo Basin and the Oxnard Plain and of the west end of Pleasant Valley, is 60,000 ac. ft. The average annual contribution from the Santa Clara River to the water supply of the Coastal Plain, during a 14-year period of drought as 1923-1936, would be about 25,000 ac. ft. plus 5,000 ac. ft. from percolation on the non-pressure area and small streams, a total of 30,000 ac. ft. In a period of drought, the deficiency in supply would



be 30,000 ac. ft., even if no further increase over the present demand occurred. It is estimated, moreover, that annual demand in the Santa Clara Valley in the near future will decrease recharge of the Montalvo Pool by about 12,000 ac. ft. and demand will increase in the Coastal Plain by about 18,000 ac. ft. This would bring an additional deficit of 30,000 ac. ft., making a total probable annual deficiency of 60,000 ac. ft.

Although previously there was an underground flow from Pleasant Valley to Oxnard Plain, the water now moves in the opposite direction. The water level in Pleasant Valley will continue to lower because of the large amount being pumped from the meager supply there. In the spring of 1947 the water level under 55 sq. mi. of Oxnard Plain and Pleasant Valley was below sea level. As there is no subterranean barrier along the coast, there is definite danger that further recession of the water level will be accompanied by sea water intrusion.

The present dangers of a lowering water plane and the threat of sea water intrusion, plus the demands of the future for an increase in water supply, strongly indicate the need for surface storage, through the construction of dams on the Sespe and Piru Creeks, in addition to the present expansion of water conservation operations of the District.

Termites Controlled by Chemical Treatment of Infested Soils

SEVEN CHEMICALS among those which have proved reasonably efficient in the control of termites by soil-poisoning are listed by the Bureau of Entomology and Plant Quarantine, Department of Agriculture. They are sodium arsenite, lead arsenate, sodium fluosilicate, cryolite, phenothiazine, pentachlorophenol, and orthodichlorobenzine. The scientists emphasize, however, that soil-poisoning is, in the main, a measure supplementary to primary termite-control methods of a structural nature, which offer permanent protection.

Soil-poisoning, though beneficial, is less permanent and should be used only where structural control methods are impractical, or in addition to them. Most termite infestations are due to faulty construction and are found principally at filled porches, terraces, and other entrance structures, or in basement apartments. Control consists, in the main, in blocking off termite entry with concrete or other impervious material.

SOIL POISONING experiments by the Department of Agriculture were carried out at the research center at Beltsville, Md. The test area is divided into 10 blocks and untreated wooden stakes are driven in the center of each plot, below. Each fall the stakes are examined and records made by Department entomologists, above.

Other recommended measures for discouraging termite activity include adequate drainage around and under buildings, ample ventilation under them, and the removal of wood debris. Such measures apply to all construction but particularly to basementless dwellings which are exceptionally favorable to termite activity. Here soil poisons have their widest potential application. Numerous chemicals and chemical mixtures have been tried over the years, but most of these tests have been without adequate standards and controls.

In recent tests, holes were dug 15 in. in diameter and 19 in. deep, about 2 cu. ft. of soil being removed. The soil is treated as it is replaced with the chemical to be tested. There are uniform blocks as replications and comparison is made with untreated controls. Wooden stakes are driven in the soil to find whether the material used protects them.

Lead arsenate, used as a dry powder, proved remarkably good during 4 years of service, whether at ¼, ½, or 1 lb. per cu. ft. of treated soil and, after 3 years, dry sodium arsenite, as well as the 10 per cent solution, held up remarkably well in low dosages. Sodium fluosilicate, cryolite, and phenothiazine used dry all showed up well, but diphenylamine and phthalonitrile, which had appeared excellent in the laboratory, failed under these conditions. Trichlorobenzene, either alone or in combination with 5 per cent of pentachlorophenol, proved good.

DDT apparently has value when used as a 5 per cent solution in fuel oil. Further tests are necessary to obtain more complete information regarding the value of DDT as a soil poison against termites, since the use of oil alone proved satisfactory for 2 years.

Incentive Wage Plan Is Upheld in Court Appeal

THE SIXTH Circuit Court of Appeals has been over-ruled by the Tax Court in the case of the Treasury Department v. the Lincoln Electric Co. This case has stirred wide interest among employers and employees of companies operating under the incentive payment plan. The Treasury Department sought to assess taxes against the company for the amount of money it paid out as bonuses. It is reported that the Treasury agent in charge of the case once said, "A man who works with his hands shouldn't be paid as much as $5,000 a year." The average worker at Lincoln Electric makes $5,400 a year. The ruling of the Court, however, is: "It is accordingly our view that we are without jurisdiction . . . to consider further any question as to the reasonableness of the contested payments as compensation." There now remains nothing for the Tax Court to do but to allow the payments in full, and the workers are thus justified in receiving a share of the profits of the company based on their own efficiency and production.

Portrait of an A. G. C. Manager

At 32, W. Don Shaw is the successful Secretary-Manager of the largest Chapter of Associated General Contractors in the United States, maintaining an outstanding program of labor relations and building friendly confidence by the public

By VANE STROTHER
Los Angeles, Calif.

W. DON SHAW at 32 is the youngest secretary-manager guiding the destiny of any of the Associated General Contractors chapters whose respective jurisdictions blanket the entire United States. Shaw's record as an executive, both in Seattle where he headed the Mountain Pacific chapter, and Los Angeles where he is presently top man in the Southern California chapter, is a testimonial to the American custom of giving an efficient man a big job and giving him his head.

Barely 30 when he took over the Los Angeles office, Shaw was faced with the job of filling the shoes of an able predecessor. Frank J. Connolly already had the Southern California chapter well known for its service to contractors. Connolly's dynamic personality was popular and his ability was respected.

Connolly's only mistake in handling the chapter was working too hard at it. Exhausted when he handed the reins to Shaw, Connolly died four months later at the age of 52.

In order to escape the same fate, Shaw delegated authority to carefully chosen subordinates and at the same time held them responsible for their respective departments. Thus avoiding lesser duties, Shaw has more time to function in an executive capacity—more time to utilize his planning and organizing ability.

The result has been not only the upholding of Connolly's high standards, but some worthwhile accomplishments strictly his own.

An early start

One reason young Mr. Shaw has accomplished so much in so short a lifetime is that he had an early start. Graduating from high school in Portland in 1934 as president of the student body, Shaw was handed a scholarship to the University of Oregon. His plans were to work awhile and save some money—then go to college. As yet Shaw hasn't gotten around to his higher education, but then he still has plenty of time.

Shaw's first job brought him into contact with contractors and their problems. Working in the office of the Commercial Explosives Division of the Winchester Repeating Arms Co. proved to be fine background for the work he was to follow. Three years later the young man was transferred to Seattle where his time was taken entirely by calling on contractors in the market for explosives.

By 1940, six years after leaving high school, Shaw was a recognized authority on the construction contracting game. He was offered the secretary-managership of the Mountain Pacific chapter of AGC. In this capacity he represented 70 contractors in western Washington and the territory of Alaska.

War was menacing the nation in 1940 when Shaw was called to Washington by the Army Engineers, or to be specific, Brig. Gen. Philip B. Fleming and Maj. Gen. Eugene Reybold. His job was to coordinate the efforts of his chapter members. Manpower and equipment were to be pooled for one big job—construction of the Alcan highway.

With Shaw working at top speed with the two Army men, the job began to move. Thirty days after he arrived in Washington the first two major contracts on the Alcan were awarded. E. W. Elliott and L. G. Dowell, both past presidents of the Mountain Pacific chapter were the successful bidders. Portions of their prime contracts were subcontracted to approximately 25 northwest outfits.

The Alcan Highway was under construction the way the Army wanted it—as fast as possible.

The largest chapter

Moving to Los Angeles in 1945 was a big step up the ladder for Shaw. Southern California was and is the largest of the nation's 102 AGC chapters. Main reason for the size of the chapter is—some rare common sense exercised by both management and labor in the period just before the war.

For years Southern California was "open shop," a condition described as just short of heaven by many managements. However, contractors were paying for this doubtful luxury in frequent work stoppages, constant bickering with the unions, and the general ill will of construction workers.

W. DON SHAW

In 1941 a closed shop contract was negotiated by AGC that has ended strikes for what looks to be an infinite period of labor peace. Throughout the war the longest any job was stalled due to labor trouble was one-half day. No other chapter can match that record, or the fine record compiled to date in the tumultuous postwar period.

Hub of the arrangement that has worked so well in Southern California is the Joint Conference Board—and the confidence the Board enjoys from both sides. The Board is composed of 16 men, half labor-half management. Regular meetings are held twice monthly, at which time disputes are threshed out. Work continues, meanwhile, and both sides are bound to accept the Board's decisions.

Shortly after the Southern California Master Labor Agreement went into effect between AGC members and the A. F. of L. Building and Construction Trades Council, membership in AGC began to swell. Firms outside the organization began to envy the uninterrupted schedules maintained by AGC members. In the first year membership in the Southern California chapter rose from 125 to 225, and now includes 300 major commercial and industrial builders, highway builders and engineering firms.

Shaw's first job in labor relations, and in other fields, was to hold onto the gains won by Connolly. There was room for expansion in other directions, however.

Legislative activities

Like all AGC chapters, Southern California's service to its members includes aid in the legislative arena. Activity in this field was stepped up considerably by the young executive. To give an idea of how his interest runs along this line, 30 bills were introduced on the floor of the legislature during the 1947 session alone as a result of the chapter's efforts. In addition, Shaw was in the fight alongside Governor Earl Warren to protect the highway program embodied in the Burns bill.

Primary aim of most of the legislation backed by Shaw's office is to halt the drift toward "force account" construction by state, county, and city governments. Shaw terms "force account" the number one enemy of the construction industry. And besides, says Shaw, the theory behind such methods is contrary to the basic principles of free enterprise (a system which he apparently understands from pure competitive instinct).

The man in charge of carrying out the legislative program under the guidance of the chapter's legislative committee is an example of Shaw's ability

WESTERN CONFERENCE of A. G. C. executives was held in Los Angeles last month under the sponsorship of the Southern California Chapter and its dynamic manager, DON SHAW, shown here at the left, joining with MAX KEMPER, Chapter president, right, in welcoming H. E. (DOC) FOREMAN, national secretary, to the meeting.

to draw top-flight personnel around him. Charles W. Lyon, with a career of 22 years in the California legislature behind him, knows what makes the wheels turn in Sacramento. He was formerly speaker of the Assembly and for 12 years was State Senator from Los Angeles.

Other activities

One service which is furnished with varying effectiveness by all AGC chapters is the publication of news pertaining to the industry via a semi-monthly bulletin. In the Los Angeles office an important part of the bulletin's contents is furnished by the law firm retained for general practice. Tax matters, city ordinances and new legislation are interpreted on the basis of what a busy contractor should know, but hasn't time to figure out.

Since few contractors have time to investigate problems outside their own job site, most members find this service of inestimable value.

Allied industries

Another phase of Shaw's battle on behalf of the construction industry is his organization of the Allied Committee of Construction Industries of Southern California. This committee meets monthly and is composed of three delegates each from AGC, American Institute of Architects, Structural Engineers Association, and Building Contractors Association.

Purpose of the allied group, as explained by its organizer, is ". . . a unification of all segments of the industry to promote more favorable public relations with all awarding agencies, and to voice a unified program that is to the best interest not only of the industry, but of government and taxpayers as well."

Broken down into specific goals, Shaw is after uniform building codes and elimination of outmoded zoning restrictions.

Perhaps the biggest accomplishment to be credited by the construction industry to Shaw is in the public relations field. In 1946 the Southern California chapter bought stock in the Home & Building Exposition. The two expositions staged by the corporation so far have been spectacular successes, and the show is now considered the public event of the year by the industry in that part of the state.

Shaw's plans for the AGC exhibit at the 1948 show are already made, but he admits there are several hurdles to be cleared before he can consider them definite. He hopes to build a giant relief map of the Los Angeles area in one of the largest exhibition spaces available at the Pan Pacific Auditorium, where the show is regularly held. On the map will be constructed a complete scale replica of the planned multi-million dollar freeway network for that area.

Also on the map, if his plans are accepted, will be major industrial and commercial construction jobs completed recently or contemplated.

"People don't know how fast this area is developing. They don't know how vast the potentialities are, or how rapidly this potential is being realized," Shaw stated when asked the source of his inspiration for next year's exhibit.

Terrific volume

The young executive's faith in his chapter's geographical good fortune is borne out by figures on the membership's volume of business. For the last ten months, Shaw said, the 300 members have averaged among them a total of $19,000,000 plus in contracts every 30 days. This figure does not include jobs costing less than $25,000, it was explained.

When asked if there was any sign of this volume declining, Shaw said, "Not at all. The upward trend continues from month to month."

There is no mystery about how Connolly worked himself into an early grave, so far as Shaw is concerned. The youthful administrator acknowledged logging 160 hours in the air so far this year while making the rounds of meetings in Washington, D. C., Denver, etc.

Busy though he is, Shaw still finds a little time to spend with his family. Married since 1936, he now has two sons—the oldest, Bill, is now 10.

Bill is already showing promise, the proud father and busy executive reports. Not long ago he approached Shaw on getting a job carrying the water bucket at a construction site. Nothing like getting an early start in one's chosen field, the boy reasoned.

Los Angeles Chapter Is Host to Western A. G. C.

THE QUARTERLY conference of the Western chapters of Associated General Contractors was held in Los Angeles No. 3-4 under the auspices of the Southern California Chapter and Don Shaw, its manager. Practically all Western chapters were represented by their manager and president.

H. E. Foreman, Managing Director of the National Association and J. D. Marshall, Assistant Managing Director, both from the Washington, D. C. office were in attendance and offered important contributions to the program.

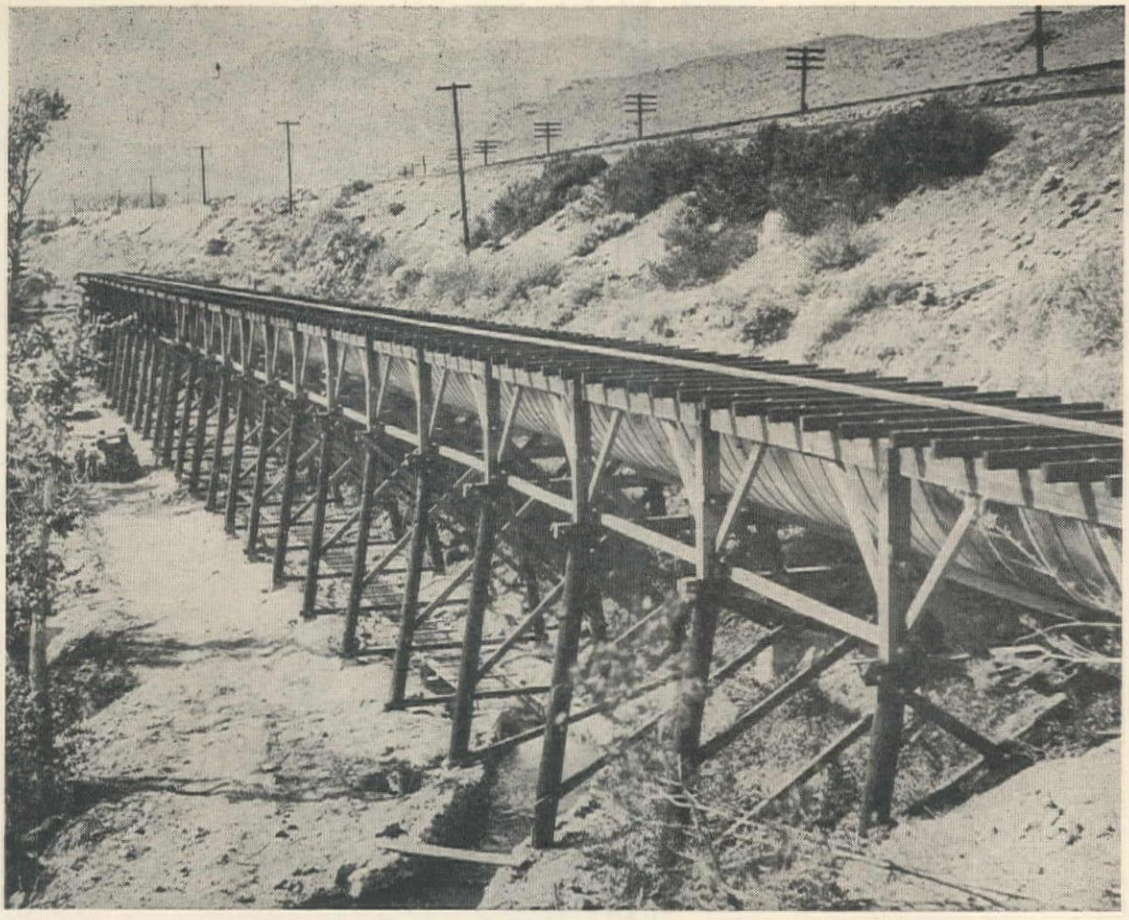
George Atkinson reported on progress of the Special Projects Committee appointed at the previous meeting. Its duty was to assemble information on proposed construction projects over the West. However, the committee had met with little success, particularly from Federal bureaus because of the Budget Bureau limitations on fiscal information.

Colonel Joseph O. Killian, Executive Officer of the Corps of Engineers for the Los Angeles District, outlined in considerable detail the plan to have AGC Chapters sponsor Army Engineer units in the Reserve Army. It was reported that the Portland Chapter was the first to complete its arrangements and to be notified of acceptance of its unit.

National Vice President Adolph Teichert reported briefly on the convention of the National Reclamation Association held the week previous in Phoenix, and pointed out that Resolution No. 3 in that convention proposed a virtual blank check to the Bureau of Reclamation, enabling them to construct their works by force account whenever and to whatever degree they chose. The principal resolution adopted by the Chapter conference urged the Reclamation Association to rescind the force account resolution and urged all chapters to make appropriate efforts to counteract the unfortunate action.

Officers elected for the coming year were: Chairman, A. L. Atherton, Atherton Construction Co., Seattle; Vice-chairman, H. L. Royden, Phoenix, Ariz.; Vice-chairman, Bruce Hazard, R. E. Hazard Construction Co., San Diego; Treasurer, William Tait, W. C. Tait Co., San Francisco.

Luncheons and other social activities were conducted in splendid style by the Southern California Chapter.



FLUME NO. 2 of the Highland Canal of the Sierra Pacific Power Co., which furnishes municipal water to the city of Reno, Nev. This 444-ft. flume was formerly a wooden box, but has been replaced as shown with sheet metal. Underneath the main flume is a small irrigation ditch, seepage from which softened foundations, but this is eliminated by a small metal flume.

Reno Water Supply—
Wooden Box Replaced by Metal Flume

Domestic water supply increased from 70 to 120 cu. ft. per sec. and worn out wooden flumes replaced with semi-circular metal flumes on wooden sub-structures — Single canal system utilized to supply water to power plants, municipalities, and irrigation systems near Reno

By T. A. BITHER
Associate Member,
American Society of Civil Engineers
Berkeley, Calif.

TO MEET demands of increased water consumption, the Sierra Pacific Power Co. of Reno, Nev., has recently replaced several deteriorated structures on their Highland Canal which is one of the main sources of domestic water supply for the cities of Reno and Sparks as well as suburban areas contiguous to them. The Company not only supplies these communities with water, but also with electrical energy for power, light and heat and with propane gas from a new, modern plant for domestic cooking and heating as well as for industrial and commercial uses.

Electrical energy is generated in five hydro-electric plants designated as Farad, Fleish, Verdi, Washoe and Reno. These plants are located in that succession along the Truckee River between Floriston, Calif., and Reno. Approximately 500 sec. ft. of water is diverted from the river at Floriston and is carried down to Farad for a distance of about three-quarters of a mile, where it is dropped through the wheels of the Farad Power House. Due to the narrow, rocky condition of the Truckee River canyon throughout this distance, this diversion is conveyed entirely in a flume which is of the wood box type of construction, 10 ft. wide and 8 ft. deep, constructed on a grade of less than one foot of fall per thousand feet of length.

After passing through the Farad plant, the water returns to the river, to be diverted again a short distance below at a point near the Nevada-California state line. It is conveyed in a canal section and then in a wood box flume of the same type as the Farad flume down to Fleish where it is dropped again, this time through the Fleish plant. In a similar manner diversions are made from the river and conveyed by canal and flume to the three other plants—Verdi, Washoe and Reno.

Source of water

The principal source of water for domestic and industrial use in the city is also the Truckee River. The diversion dam is located about one mile below Verdi, a short distance from the point where the Washoe diversion is made. Water is conveyed in the Highland Canal, taking out from the left side of the river, to three reservoirs located in the northwest part of the city. Water consumption in Reno is very high, the

maximum daily requirement during the summer months being about 28 mgd. which represents a maximum daily per capita consumption of approximately 780 gal. — unquestionably one of the highest in the country. The present capacity of the upper section of Highland Canal is about 70 sec. ft., but due to the rapid growth of the area served and the consequent ever-increasing demand, it is planned to increase the capacity to 120 sec. ft. at the intake. Irrigation turnouts and seepage losses throughout the twelve-mile long canal will permit a reduction in section toward the lower end —it being planned eventually to supply over 50 sec. ft., or about 33 mgd. into the reservoirs from this canal, additional requirements coming from other sources.

Head gates replaced

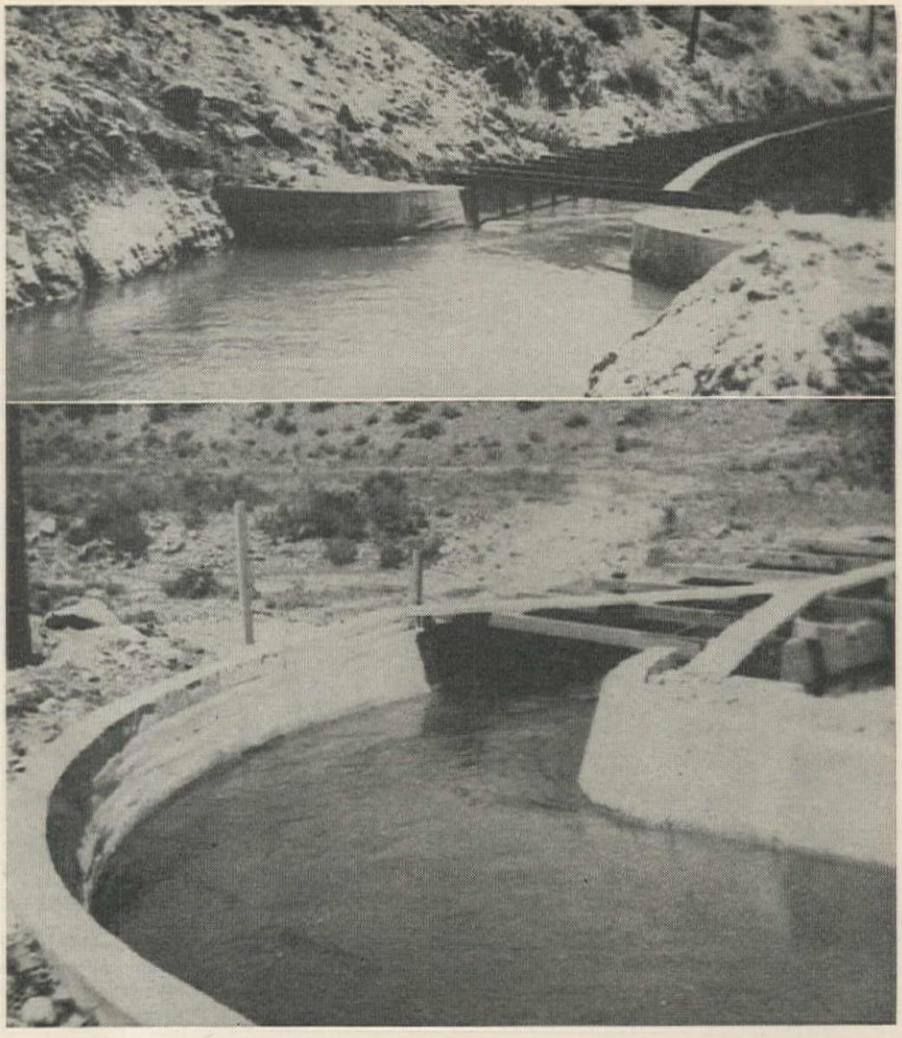
There are 25 flumes on the Highland Canal, of the same general type of wood box construction as those on the power canals, and the diversion gates were also of wood, discharging into the intake end of the canal through wooden troughs. The head gates and several of the flumes, as wells as the pipe line leading from the canal to the three reservoirs, comprised the recent replacements, In conformance with the plans to enlarge the capacity of the canal, these new structures were installed of sufficient size to accommodate the increased flow to be carried in the future.

At the intake there are two 48-in. Calco Metergates each discharging into the canal through 60 ft. of 48-in., 12-gage Armco corrugated pipe. These Metergates have been equipped with differential recording gages which provide a method of keeping a continuous record of the amount of water entering the canal. Similarly, at the lower end of the canal, a 36-in. Metergate has been installed on the pipe line equipped with a recording gage to furnish a continuous record of the diversion to the city reservoir, as well as a 36-in. Metergate to measure and keep a record of the irrigation water passing on into the smaller Highland Ditch Extension, which serves several farms beyond the point where the city water supply is taken out.

Flumes No. 2, No. 22 and No. 23 being those in worst condition, were the ones chosen for replacement first. These wooden flumes were replaced with Armco Lennon Type semi-circular metal flumes on wooden sub-structures. The first one listed, being at the upper end of the canal, is the largest of the three. It is a 16-gage flume with a semi-circular diameter of 107 in. This flume is also the longest of the three, its total length being 444 ft. The sub-structure for this flume is of the two-story type. The lower portion of the structure is constructed with pile butts for posts, placed on a batter on concrete footings. The upper story, carrying the metal flume section has vertical posts. The intake and outlet transitions between canal and flume are of concrete.

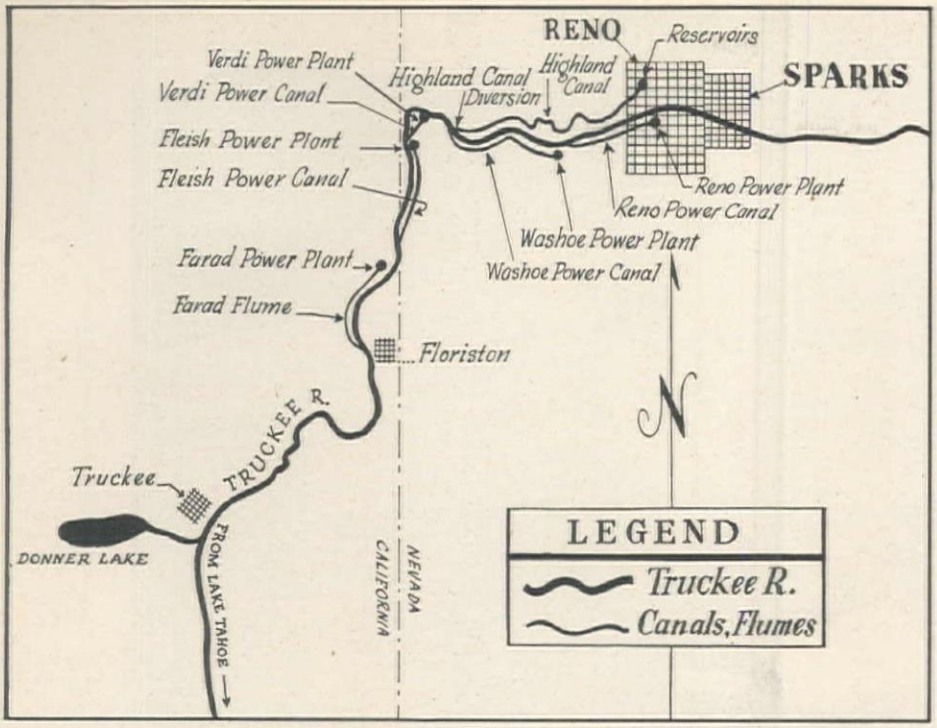
The intake transitions are so constructed that a minimum amount of turbulence exists at the point where the section changes. At the point where flume No. 2 was reconstructed, a small ditch carrying irrigation water runs along the bottom of the swale which this flume spans. The material through which this ditch was dug is of a porous nature, causing seepage through its banks which soaked and softened the ground where the footings of the flume sub-structure were to be poured. To eliminate possible trouble from this source a small metal flume was suspended from the sub-structure of Flume No. 2, near the bottom, to carry the irrigation ditch across this low area.

Flumes 22 and 23, being farther down



TO REDUCE turbulence in canal flow special concrete transition sections were designed at the intakes of the new metal flumes. The top picture shows the transition for No. 2 Flume, while the lower photo is an example of the curved type at the intake of Flumes No. 22 and 23 of the Highland Canal system near Reno.

OLD WOOD box flume 10 ft. wide and 8 ft. high conveying Truckee River water to the Farad power plant, one of five plants in the system. Leaks in the flume are frequent.



the canal where less capacity will be required, have a diameter of 7 ft. 7¾ in. The substructure for these flumes is of similar construction to that of Flume No. 2 and the transitions are likewise of concrete. However, in both cases the transitions are of necessity constructed on a curve, requiring special designs.

The pipe line carrying water from the canal to the reservoirs consists of 1,351 ft. of 36-in., 14-gage, Armco asbestos bonded paved invert pipe connected with watertight couplers.

The advantages of using metal flume as compared to wood box construction were immediately apparent, the principal ones being smooth interior with high carrying capacity and entire elimination of leakage.

The work described was under the direction of F. G. Barnett, general superintendent of the Sierra Pacific Power Co. and under the immediate supervision of Neil W. Plath, construction superintendent. William A. Totman is superintendent of the Water Department.

Runway Standards Are Established By Civil Aeronautics Authority

THE CIVIL Aeronautics Administration has set maximums on length and strength of runways for which Federal money will be supplied, naming six classifications of fields ranging from Feeder Airports, having a length of 3,500 ft. to International Express Airports, with runways 8,400 ft. long.

Purpose of the order is to guide employees of the CAA regarding approvals and recommendations for runway design; to indicate to sponsors of airport projects under the Federal Airport Act the extent to which Federal funds will be applied; and to indicate to manufacturers and operators of transport type aircraft the runways which will be available.

Following are the standards set by CAA:

Definitions of the airport classifications follow:

Feeder—Airports to serve certificated feeder line airlines.

Local—Airports to serve smaller cities on airline trunk routes.

Express—Airports at important cities or junction points on trunk routes.

De Luxe—Airports serving aircraft making long non-stop domestic flights.

International—Airports terminating long international flights.

International Express—Airports serving the highest type of transoceanic flights.

The runway lengths established are for airports at sea level, and a temperature of 59 deg. F. These lengths will be increased for airport elevation by 7% for each 1,000 ft. of elevation above sea level, and one-half of one per cent for each degree by which the mean temperature of the hottest month of the year, averaged over a period of years, exceeds the standard temperature. Runway gradient also will be taken into account in determining length.

Air Carrier Service	Runway feet Length	Runway feet Width	Taxiway feet Width	Landing Strip feet Width	Pavement Loading per wheel in lbs. Single Wheel	Pavement Loading per wheel in lbs. Dual Wheel
Feeder	3500	100	40	300	15,000	20,000
Local	4200	150	50	400	30,000	40,000
Express	5000	150	60	500	45,000	60,000
De Luxe	5900	150	75	500	60,000	80,000
Internatl.	7000	200	75	500	75,000	100,000
Intl. Expr.	8400	200	100	500	100,000	125,000

Railroad Proposed From California to Nevada

J. N. LENTELL, veteran northern California engineer, has presented proposals for a new railroad line to run from Humboldt Co., Calif., to Humboldt Co., Nev. The line would be from Trinidad, one of the oldest ports in California, thence over a 3,500-ft. summit to the Sacramento Valley near Red Bluff, Calif., and on across the Sierra Nevadas at 5,000-ft. elevation through Susanville and on into Winnemucca, Nev. The maximum grade of the proposed route would be one per cent.

Lentell stated that his proposal was the result of many years of preliminary surveys. He suggested that such a railroad would provide the shortest and straightest route across the United States, and that the California terminal would be further west than any other.

Other arguments for the new railroad are that it is needed across northern California to open vast timber, mining and stock raising regions, and that Trinidad has promise of being the best port between San Francisco and Seattle. The war boom in shipping to the Orient was the original incentive for the plan.

The railroad companies are as yet disinterested in the possible development. G. W. Harris, chief engineer of the Atchison, Topeka and Santa Fe, disagreed that water traffic could be diverted from either San Francisco or Los Angeles and said his company would not be interested in the proposition. Charles Esley, president of the Western Pacific Railroad Co., said they were not in a position to undertake a project of such magnitude.

University of Colorado Plans Memorial Recreation Center

PLANS FOR THE largest and most costly structure to be built on the University of Colorado campus at Boulder have been announced by President Robert L. Stearns. The building, to cost $2,500,000, will be a student recreation and social activities center and has been designated as the official state memorial dedicated to Colorado war heroes who lost their lives in World War II.

Design of the new building will simulate the same "Rural Italian" architecture as the other newer buildings on the campus. It will be five floors high and measure 180 x 290 ft. A tentative site has been designated in the area east of the library and directly south of the men's gymnasium. Dr. Stearns stated that he hoped construction could be started next summer.

Malibu Shore Road Rebuilt

Extremely heavy cuts and fills feature relocation of Pacific Coast Highway—Million and a half cubic yards of excavation necessitate use of heaviest equipment—Extra length culverts, some built on curves, also add to interest in the project to eliminate slides, bad curves and narrow paving

By ERNEST DENNING
Long Beach, Calif.

A NEW, almost completely relocated 4.8-mi. segment of U. S. Highway 101 about ten miles west of Santa Monica, Calif., probably will be completed early in January. Prime contractor on this $1,543,000 job is Peter Kiewit Sons' Co. of Arcadia, Calif.

The Division of Highways of the Department of Public Works of the State of California authorized the project because the old road was too narrow, too full of sharp curves, and too apt to suffer from slides—especially during annual rainy seasons. It closely paralleled the coast line at an average elevation of 18 ft. above sea level, at the bottom of precipitous, poorly consolidated bluffs. A portion of the old highway even slid into the sea in 1938. Several other bad slides occurred during other years of the 1930's.

Original construction of this portion of the Pacific Coast Highway was completed in 1926. Some repaving took place in 1939 when the highway was widened in places and, because of slides, some relocating was accomplished.

Improvements made

The exact location of the new road is from Malibu Creek bridge to a point west of Latigo Canyon—4.8 miles—on the highway between Santa Monica and Oxnard. The new survey makes these improvements over the old: the old road is entirely replaced; the highway is straightened, widened; and most sharp curves are eliminated; the old road was surfaced with blacktop, the new is of Portland cement concrete; much of the new alignment is atop the bluffs, sometimes a quarter-mile from the shore.

The old survey was followed some of the distance but entirely new locations form 60 per cent of the contract. Where the new road coincides with the old, the latter has been renewed by regrading and repaving.

Project history

After the State Division of Highways authorized the project, the prime contractor submitted its bid September 26, 1946. The contract was awarded October 25, 1946. In granting the contract, the State specified that the job should be completed by February 25, 1948. The contractor expects to be done ahead of schedule.

Some preliminary studies of the area were made before the bid was submitted —especially test holes to determine material which would be encountered in the deeper cuts.

Some widening and dividing projects are anticipated for the vicinity in the future.

Job description

Five arch culverts from 442 to 560 ft. long were cast in place before grading began. These arch culverts are of horseshoe design. Their inside height measures up to 8 ft. Culvert walls vary from 7 to 10 in. in thickness.

Culverts were cast in Winter, Marie, Puerco, Flat Rock and Latigo Canyons (east to west). The culvert in Flat Rock Canyon was later replaced with a 60-in. reinforced concrete pipe. The culvert in Latigo Canyon is designed on a reverse curve to follow the course of the streambed under the high fill. There is a 21-ft. arch bridge at Solstice Creek.

Grading ranges from cuts 200 ft. deep to the 110-ft. fill across Flat Rock Canyon. Maximum grade is the first hill west of Malibu Creek near the east end of the project; it is 7 per cent. Maximum curvature on the new alignment is a curve with a radius of 3,000 ft. Cuts are expected to stand alone with slopes of ¼:1

for rock cuts and 1½:1 for the balance of the job.

From Solstice to Corral Creeks there are 11,500 cu. yd. of heavy stone riprap seawall.

Paving

Conglomerate excavated from the cliffs was employed as select base material on the highway. It was procured along the highway between Solstice and Latigo Canyons (near the west end of the project), crushed, and then placed for paving base in a layer 0.5 to 1.5 ft. thick.

Concrete pavement was laid starting in Mid-October. The paving is 24 ft. wide for both east bound and west bound lanes. It was laid in two slabs 11 ft. wide and 8 in. thick. East and west lanes are divided by a strip varying from 6 to 20 ft. in width, mostly 6 ft. The dividing strip will be planted with 60,000 ice plant cuttings.

No expansion joints in the concrete paving are being placed. While no reinforcing steel was used in the slabs, tie bolts were utilized between adjacent lanes.

Shoulders on both sides were treated with road-mix bituminous surfacing. Road oil base was laid on driveways and road approaches. Top soil and grass seed will cover excavation slopes on 1½:1 and flatter slopes. Drainage tile was laid in ditches on the high side of the highway to intercept seepage. Water is led off into natural drainage channels to relieve seepage and slide dangers.

The new road goes across many deep canyons and through deep cuts. Grading totalling almost 1½-million cubic yards was necessary. One problem was to relieve the weight of material above the road especially near Solstice Creek. Slide possibilities were reduced by removing 80,000 cu. yd. of material. The ground is heaved up in this vicinity. Strata are inclined toward the sea and toward the canyons.

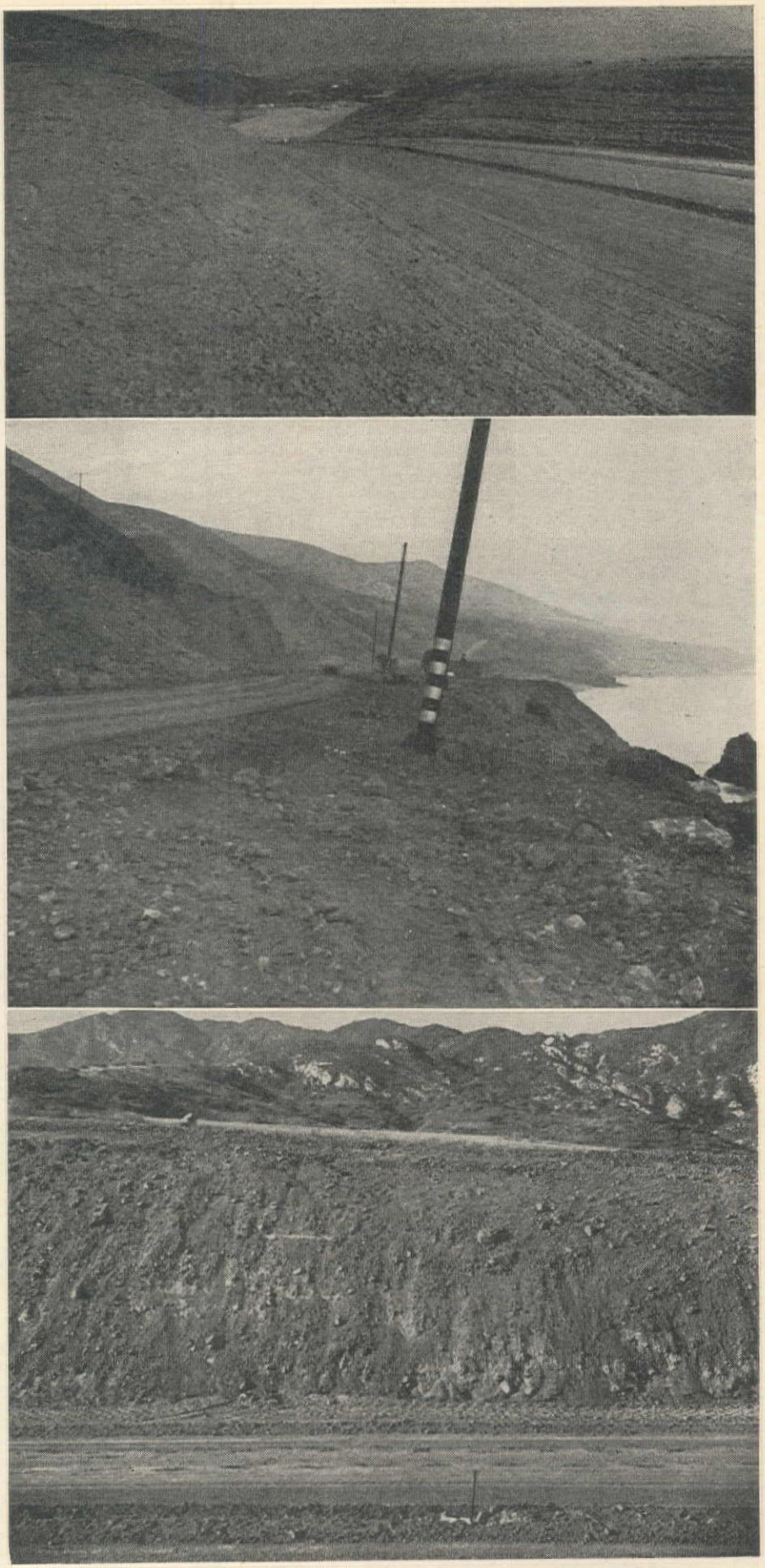
Equipment and quantities

Manufacturers whose heavy equipment was used are Caterpillar Tractor Co.; R. G. LeTourneau, Inc.; Euclid Road Machinery Co.; Northwest Engineering Co.; and the Koehring Co.

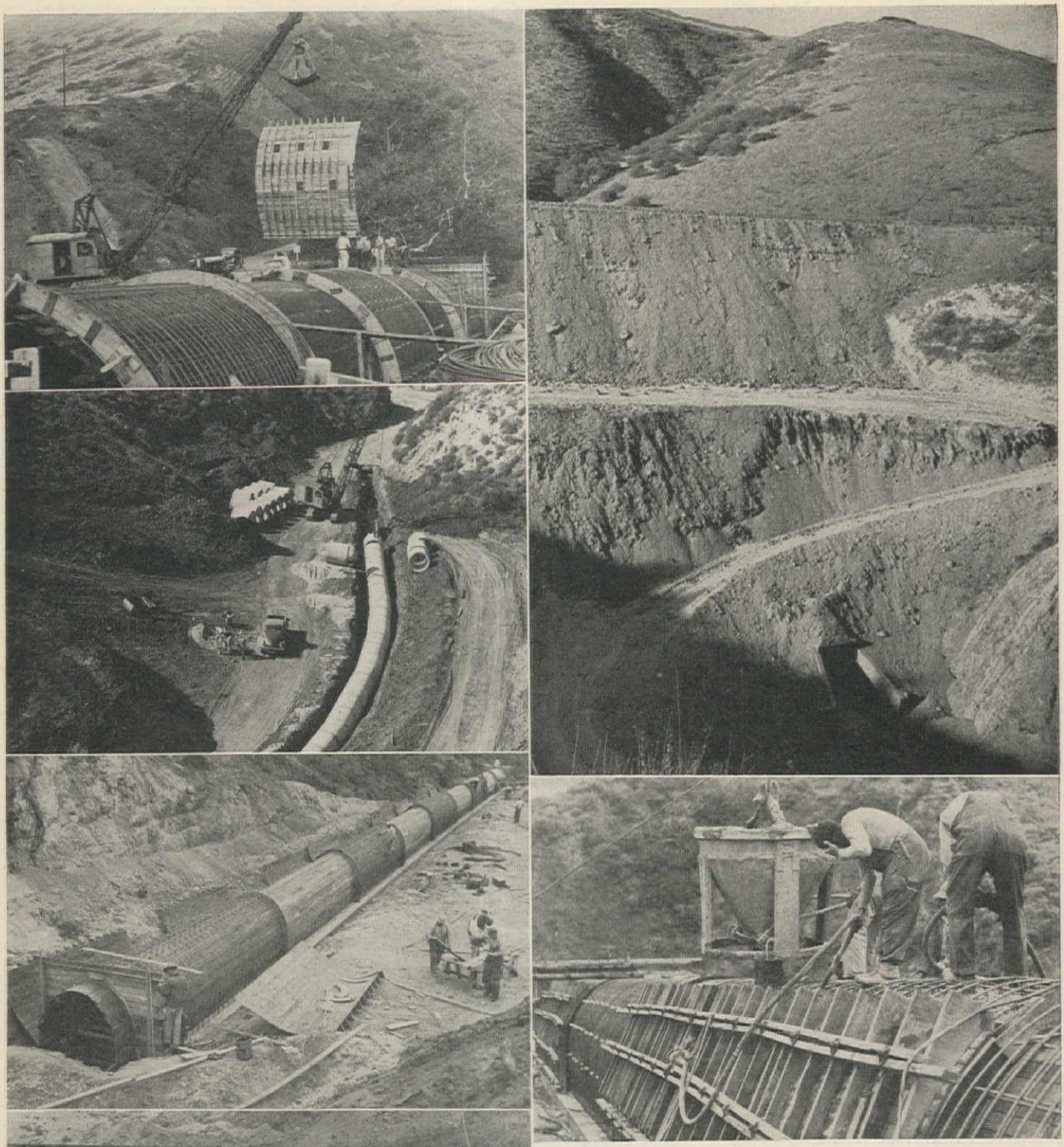
Specifically, Northwest shovels and cranes and one Koehring crane were used. Fills were compacted with eight passes of a heavy sheepsfoot roller; in the ground thus treated, no settlement is anticipated. Three kinds of equipment were used for excavation: tractors and carryalls; Tournapulls; and shovel-and-bottom-dump and shovel-and-rear-dump Euclids.

The following are major quantities for the project:

1,500,000 cu. yd. roadway excavation.
14,000,000 sta. yd. overhaul called for in the contract; the project will exceed this.
16,500 cu. yd. structure excavation.
40,000 bbl. Portland cement in paving.
3,000 bbl. Portland cement in structures.



TYPICAL EXCAVATION along the Malibu-Latigo canyon highway improvement. The cut at the top is 1,600 ft. long with a maximum depth of 55 ft. Road grade is close to 7 per cent. Maximum cut near the shore, center, was 200 ft. in conglomerate material. Loose condition of topsoil, bottom. The material was windrowed at the top of the cut slopes and pushed over with a grader. It was then removed by shovel and truck.



Photos by the author and John F. McLaughlin.

CULVERT CONSTRUCTION on the Malibu Highway project. Upper left, placing forms by crane for the 21-ft. arch bridge at Solstice canyon. Next picture below shows the 60-in. reinforced concrete pipe at Flatrock canyon; this drainage line was 560 ft. long. Second from bottom, left, construction of Winter canyon arch culvert with inside forms placed for the full length and steel set on alternate sections preparatory to placing outer forms. Arch culvert form supports for Puerco canyon drainage, bottom left; all arch bridges were cast on forms similar to these and some of the form units were used over as many as three times. In all cases the invert was poured first. Upper right, 64-ft. fill in Puerco canyon after arch culvert was installed. Pouring and vibrating concrete in Puerco canyon culvert; as shown in the opposite picture, concrete was poured in alternate sections.

27,200 cu. yd. Portland cement paving.
87,500 sq. yd. roadmix bituminous treated shoulder—both sides.
2,340 cu. yd. structural concrete.
3,600 ft. reinforced concrete pipe.
440 ft. corrugated metal pipe.
11,500 cu. yd. heavy stone riprap.

Interesting features

One of the contractor's early difficulties was waiting for a project-office telephone for ten weeks. Annoying delays were encountered because all communications had to be made by personal contacts or mail or through a long distance toll phone nearly a mile away. The project office was 40 mi. from the contractor's Arcadia office. This distance was directly through downtown Los Angeles traffic.

Army coast observation station telephone lines and civilian telephone lines alongside the highway had to be moved during the project.

Probably the gravest difficulty came in connection with highway traffic which included passenger car, bus, and truck vehicles. This traffic was very heavy along U. S. 101 during most of the construction period because it was vacation season. The terrain frequently permitted no detour construction. As a result the construction people found it necessary to hold up traffic for 15 to 20 min. at a time. When traffic was allowed through, equipment was necessarily idle sometimes as long as a half-hour.

One feature of interest was a sand blanket under one of the fills in the Malibu area. This blanket was laid to break capillary attraction where the ground water-table is high. No vertical sand drains were used in this vicinity.

Contractor and State personnel

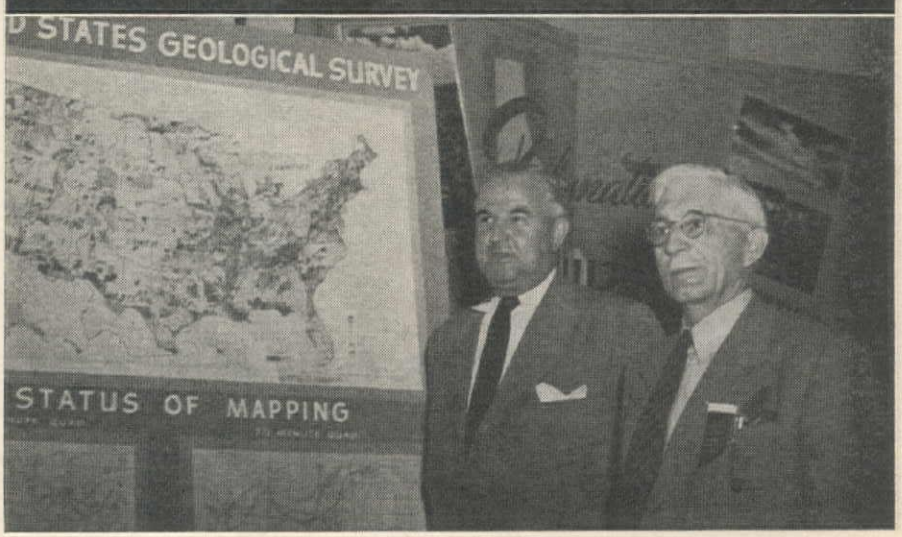
Prime contractor was Peter Kiewit Sons' Co. of Arcadia, Cal. Their personnel included H. C. Studer, general superintendent; Roy Hill, job superintendent; Donald E. Tillman, project engineer; O. K. Hoeppner, job office manager; Walter St. Jacques, mechanical superintendent.

Sub-contractors were as follows: concrete pipe, United Concrete Pipe Co.; structural concrete, Young Construction Co., Inc.; corrugated metal pipe, Armco Drainage Co.; reinforcing steel, Ceco Steel Products Corp.; asphalt plant mix material, G. & S. Asphalt Materials Co.; paving aggregate, Graham Bros., Inc.; liquid asphalt, Douglas Oil and Refining Sales Co.; cement, Southwestern Portland Cement Co., California Portland Cement Co., Monolith Portland Cement Co.; tie bolts for pavement, Ernest Figley.

State engineers having responsibility for the authorization, inception and execution of this project are G. T. McCoy, State Highway Engineer; S. V. Cortelyou, Assistant State Highway Engineer; P. O. Harding, District Engineer of Operations; F. B. Cressy, Assistant District Engineer; E. L. Seitz, Resident Engineer; E. C. Daniels, Assistant Resident Engineer, and J. H. Anderson, Chief of survey party.

Reclamation Association in Largest Convention

NATIONAL RECLAMATION Association held the largest convention in its history in October at Phoenix, Ariz. Prominent in the program were the men pictured below: MILTON KIDD, farmer, left, and CHARLES L. KAUPKE, California director of the Association, top photo; GILBERT JERTBERG, attorney, left, and EDSON ABEL, California Farm Bureau Association, center photo; WARDNER G. SCOTT, State Engineer of Nebraska, left, and FRED BUCK, State Engineer of Montana, bottom photo. Kidd, Jertberg and Abel all delivered forceful addresses attacking undesirable features of the program of the Bureau of Reclamation. The convention adopted resolutions urging repeal of the 160-ac. land limitation provision in the Central Valley of California, the San Luis Project in Colorado and the Gravity Canal Project in Texas.



NEWS OF WESTERN CONSTRUCTION

DECEMBER, 1947

California Builders Analyze Trend in Construction Costs

CONSTRUCTION COSTS will continue to rise and no hope is seen for even a leveling off of costs in the predictable future. The prevailing high costs in the construction industry are but the reflection of an inflated economy which is affecting every major consumer item. Wages and costs will continue to inch up in a slowly ascending spiral as long as a limited supply of skilled labor and material exists and until unit prices become somewhat stabilized in contrast to their present tendency to fluctuate rapidly under varied inflationary pressures.

These statements spotlight the consensus of opinion among the 250 Northern California building contractors and financiers who met recently at the annual Construction Industry Conference held in San Francisco. The architects, engineers, contractors and bankers concurred on most points in their analysis of the prevailing high cost of construction, but were uniform as well in being unable to recommend any cure for the continuing trend toward higher prices. A dozen common and familiar causes were blamed, from the labor and material shortages to government-imposed, incentive-killing taxes. What to do to remedy the causes, even when considered individually, could not be determined by the conferees. The general feeling was one of futility in the face of relentless economic trends.

Fred J. Early, Jr., northern California contractor, told the conference that he could see nothing in the immediate future which might stop the increase or tend to level off prices in the heavy construction field. He said that only a national economic catastrophe could lower prices now. He suggested, however, that sub-contractors and materials men should maintain present price levels and wage scales so that costs may be kept down to some degree.

Harry H. Hilp of the contracting firm of Barrett & Hilp, observed that demand and costs are interdependent and the demand for construction has in no way been satisfied. But he said that costs could go down if industry and labor could be streamlined in cooperation and if techniques continued to improve. An interesting point, brought up by a member of the panel in connection with this view, is that, in the heavy construction industry, the investment in time saving implements and machinery per man on the job is six times what it was before the war.

Despite the mood of futility which characterized the conference, the representative builders adjourned with the hope that they had justly defended themselves against criticism of the industry as playing a major role in contributing to rising costs.

The conference was held under auspices of the Building Industry Conference Board of the Producers' Council. John S. Bolles, San Francisco architect, acted as chief moderator. F. K. Pinney is chairman of the board.

APOLOGIES OFFERED FOR NOISE OF STEEL BUILDING ERECTION

TENANTS OF ADJOINING office buildings were startled a few days ago to see a sign on the steel work of the new General Petroleum Corp. building in Los Angeles, reading, "Our sincere apologies to our neighbors for the unavoidable annoyance this hammering must occasion." P. J. Walker Co. of Los Angeles is the contractor on the height-limit building, a block long and a half-block deep, to be finished in 1948.

San Franciscans Okeh Tremendous Bond Issue

A SECOND PIPELINE from Hetch Hetchy Tunnels around the Bay to bring water into San Francisco will be constructed under a tremendous program to be financed by bond issues totaling $87,050,000. The bond issues were carried by a heavy plurality in the Nov. 4 San Francisco elections. Six propositions approved by the voters provide $25,000,000 for the new pipeline, $22,850,000 for street improvements in San Francisco, $20,000,000 for municipal railway rehabilitation, $12,000,000 for expansion of the city's recreation facilities, and $5,000,000 for construction of downtown parking facilities.

The projected pipeline approved by the civic-minded citizens of San Francisco will consist of 60-in. pipe from the Hetch Hetchy Tunnels, major portion

of which are in Tuolumne Co., and will traverse Stanislaus, San Joaquin, Alameda, and San Mateo Cos. before reaching delivery point in San Francisco. Major portion of the street improvement program will be the removal of tracks and replacement of streets. The tracks will lose their usefulness as soon as the city purchases the motor coaches and trackless trolleys provided for by the railway rehabilitation bonds.

The recreation bonds make possible the improvement and enlargement of existing playgrounds and provide for the acquisition of new playgrounds and recreation centers and the construction of appurenant buildings. The downtown traffic problem in San Francisco will be alleviated as quickly as possible under the terms of approval of the off-street parking bonds. Public parking lots and public garages are planned to facilitate handling of the traffic burden in the congested area.

Profit Increase Shown For Morrison-Knudsen

NET EARNINGS of Morrison-Knudsen Co., Inc., Boise, Idaho, construction concern, for the nine months ending Sept. 30 were $2,558,500 after reserve for taxes, or $3.52 per share of $10 par value common stock after provision for preferred stock dividends, company president Harry W. Morrison announced in a letter to stockholders.

During the corresponding period in 1946, net earnings totaled $2,393,300, or $3.28 per share on the same basis.

Morrison, reporting the declaration by the board of directors of the regular quarterly dividend of 62½ cents per share on the corporation's 60,000 shares of five per cent preferred stock ($50 par value) and the second 1947 semi-annual dividend of 45 cents per share on the 698,200 shares of common stock, pointed out that dollar volume of contract work during the first three quarters of the year is above last year's, and the backlog of uncompleted work is greater than it was at this time in 1946.

The earnings covered in the letter to stockholders include those of the parent company, plus its share in those of its domestic subsidiaries.

Cheyenne Streets Resurfaced

ALMOST HALF of the streets in Cheyenne, Wyo., have been resurfaced or newly laid since spring. One hundred block lengths have been resurfaced, laid or repaired to a high standard.

The downtown district has been reconstructed with asphalt surfacing, as has most of the Capitol Heights section. The entire South Side has been either resurfaced or repaired, and new streets have been located along Logan Ave., part of Snyder, and Fifth St.

A. W. Trout, Cheyenne Commissioner of Streets, stated that the city's streets are in better condition than they were before the war stopped the construction program.

CONTRACTORS SIGN ENGINEER UNIT SPONSOR'S AGREEMENT

PAUL FIORITO, president (right), and PAUL FREDRICKSON, secretary-manager (left) of the Mountain Pacific Chapter of the Associated General Contractors, Seattle, sign a sponsor's agreement in the presence of LT. COL. WILLIAM R. SHULER, executive officer for the Seattle district, Corps of Engineers. Under the terms of the agreement the Mountain Pacific Chapter will sponsor the headquarters and headquarters company of an engineer port construction and repair group. A military committee consisting of T. H. YOUELL, chairman, C. R. WILCOX, JOHN WARD, C. W. WOODS, and J. A. TROXEL will select the group commander from among engineer reserve officers in the Seattle area.

Recent REA Loans Provide $5,500,000 For Western Electrification Projects

LOANS MADE available by the Rural Electrification Administration to Western borrowers in recent weeks include the following amounts. These funds will be used to finance rural electric facilities, including transmission lines, to individual farms and other rural establishments. New construction will start as soon as materials become available.

California

To Plumas Sierra Rural Electric Cooperative, Portola, $200,000 to complete prior work, including 10 mi. of transmission lines and 59 mi. distribution lines.

Idaho

To Kootenai Rural Electrification Association, Coeur d'Alene, $190,000 for 7 mi. of line.

Montana

To Furges Electric Coop., Lewistown, $540,000 for 350 mi. of line; to Big Flat Coop., Turner, $150,000 for 107 mi. of line; to Northern Electric Coop., Opheim, $100,000 for completion of previously approved work.

Nebraska

To Howard-Greeley Rural Public Power District, St. Paul, $436,000, for 14 mi. transmission line and 187 mi. distribution line.

New Mexico

To Farmers Electric Coop., Clovis, $265,000, for system improvements and 162 mi. of distribution line.

North Dakota

To West Plains Electric Coop., Dickinson, $400,000, for completion of earlier construction, and 240 mi. of distribution line.

Oklahoma

To Kiwash Electric Coop., Cordell, $340,000 to complete previous construction and for 165 mi. distribution line; to Harmon Electric Assn., Hollis, $272,000 for 125 mi. of distribution lines.

South Dakota

To Butte Electric Assn., Newell, $180,000, for 131 mi. of distribution line.

Texas

To Fort Belknap Electric Coop., Olney, $185,000, for 173 mi. of line; to Concho Valley Electric Coop., San Angelo, $280,000, for system improvements, warehouse, and 233 mi. of line; to Guadalupe Valley Electric Coop., Cost, $50,-

000, to finance farmstead wiring and plumbing and electric appliances; to Pedernales Electric Coop., Johnson City, $215,000 for 153 mi. of line; to Stamford Electric Coop., Stamford, $100,000, for 58 mi. of line; to Wise Electric Coop., Decatur, $250,000, for system improvements and 183 mi. of line; to Medina Electric Coop., Hondo, $185,000, for headquarters, completion of earlier work, and 9 mi. of line; to Deaf Smith County Electric Coop., Hereford, $350,000, for 193 mi. of distribution line.

Washington

To Big Ben Electric Coop., Ritzville, $415,000 for completion of previous construction and 204 mi. of line; to Pend Oreille County P.U.D. No. 1, Newport, $90,000 to complete previously approved construction.

Wyoming

To Hot Springs County Rural Electric Assn., Thermopolis, $180,000, to complete earlier work and for 70 mi. of line.

Building Code Changes Planned at Conference

COMPLETING twenty-five years of maintenance of the Uniform Building Code, the Pacific Coast Building Officials Conference and its affiliate, the Uniform Building Code Association, met in their annual business meeting at Grand Canyon, Arizona recently. The release of a new building code for small jurisdictions was announced to the 270 members of the organization.

The new document is an abbreviated form of the basic document, the parent Uniform Building Code, and is designed for jurisdictions of under 10,000 population and to apply to buildings not over 7,500 sq. ft. in ground floor area. The small code requires that all other structures comply with the latest edition of the parent code.

At the same meeting, the organization continued its work of keeping the Uniform Building Code up to date by introducing some 300 suggested revisions to the 1946 edition. These suggested revisions had been published during the course of the year for study by the members of the organization and had been the subject of committee study for a year or more.

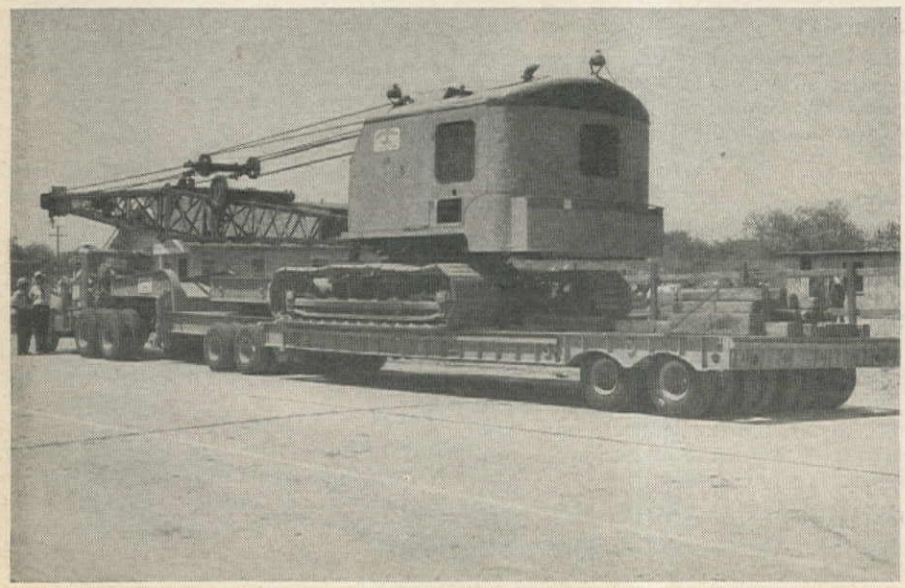
Of the 300 revisions, approximately 100 were approved by members representing cities operating under the Uniform Code, the balance either approved tentatively and set aside for another year of study or disapproved.

Meetings during the week of the conference featured discussions by leading building officials on modern time-saving, money-saving and labor-saving provisions for the next edition of the Code which will come from the press in 1949 and will supersede the 1946 edition now being used. The new edition, accompanied by an edition of the small code, will be released March 1, 1949. Keynote of the sessions was a discussion concerning cooperation of the building officials of the United States on a national basis, disregarding geographical boundaries.

Building officials from all over the United States and representing Canada attended the sessions. Featured speakers were Senator Ernest McFarland, United States Senator from Arizona; James W. Follin, Assistant Administrator, Federal Works Agency in Washington, D. C., who gave the keynote address, and James H. Mooney, president of the Building Officials Conference of America, Boston, Mass.

TWO-IN-ONE TRAILER HAS 100-TON CARRYING CAPACITY

THE HUGE TRAILER has two semi-trailer units of the "gooseneck" type operating as one with each having an individual load carrying capacity. This design was necessary to obtain proper weight distribution. A total of 42 tires cushions the load. Dimensions of the rig exceed legal limits so highway operation is by special permit. Manufactured in Los Angeles by the Fruehauf Trailer Co., the trailer is being used for hauling construction equipment by Artukovich Bros., contractors at Hynes, Calif.



Total New Construction Value Tops 1946 Figure

NEW CONSTRUCTION put in place in the United States during October, 1947, is estimated at $1,252 million, a less than seasonal drop of 1 per cent from the revised September figure and a gain of 17 per cent over October, 1946, the Construction Division, Department of Commerce, has announced.

Total new construction during the first 10 months of 1947 is estimated at $10,275 million, a gain of 29 per cent over the corresponding period of last year and 4 per cent higher than all of 1946.

New private construction in October, estimated at $958 million, was $1 million more than in September. Of this total, private residential construction (exclusive of farm) was $500 million, a contraseasonal gain of 3 per cent over September. October private nonresidential building was $281 million, 2 per cent above September.

Privately financed public utility construction in October totaled $127 million, a loss of 4 per cent from the September figure. New public construction in September, estimated at $294 million, was 3 per cent below the September figure. Of this total, public residential construction accounted for $9 million, the same as in September. Public nonresidential building totaled $43 million, a 4 per cent loss from September.

Public highway construction in October totaled $140 million, the same as in September.

Fifth Ave. Overhead . . .

(Continued from page 64)

end of the bridge. Nearby, in the vicinity of 42nd Avenue, will be two clover leaf structures to take High Street traffic under Southern Pacific and Western Pacific tracks and San Leandro Boulevard, guiding it to and from the highway. Bids will be called early next year for these structures.

The development of the San Leandro Bay area into a $60,000,000 marine terminal and industrial center, and the Eastshore Freeway are designed to complement each other upon completion. Along the Alameda shore, dredges are pumping up sand and depositing it along the Freeway route where it will run between the Bay and the new industrial area. Johnson-Western American of Alameda have the $897,000 contract involving the movement of 900,000 cu. yd. of sand.

Seven of the Freeway structures will be built in the San Leandro area. Farthest to the south will be a 1,462-ft. bridge spanning San Leandro Creek and nearby rail lines. At 98th Ave., the Freeway will pass under a grade separation to bring San Leandro and East Oakland traffic into the Freeway. A similar structure 580 ft. in length will be built at Hegenberger Road designed to handle the traffic eventually to come from the marine terminal and industrial area. As the Freeway skirts the shore of San Leandro Bay, it will pass over four more bridges, each about 90 ft. in length, spanning Bay sloughs.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.,—If a way can be found to place the bill on the Calendar, it seems probable that potential legislation will be brought up in the Special Session providing for complete mobilization of industry and absolute control of the civilian economy, in the event of an emergency which might spring from the threat of war, or actual war. National Defense Secretary Forrestal and Munitions Board Chairman Thomas J. Hargrave, testifying before the Senate War Investigating Committee, urged anticipatory action on the grounds that the enabling legislation should be enacted during the period while the Congress has time to discuss it, rather than to wait to rush it through in the event of an emergency. It is feared that if the discussion of such proposed legislation is left until the last moment, the controversy in Congress and throughout the country might cause a dangerous delay.

The military planners hope that such legislation will be enacted at least not later than during 1948. It is quite clear from the testimony that the Defense agencies feel the international situation does not warrant the assumption that too much may be left to chance. The Secretary of National Defense urged upon the committee that there is nothing on the statute books now which would enable the Government to secure the mobilization the Armed Services (necessary if war threatens), and that such "laws and directives should be on the shelf, as it were, ready to pull out when they are necessary." It was Chairman Hargraves who reported that the staff of the Munitions Board is working on such a program, and it was his opinion that the necessary legislation could be passed now when Congress and the Nation could give it more unemotional consideration. The program and the discussion which may soon come before the country has a very direct bearing on the business of the heavy construction industries. Manpower for essential industries will naturally be one of the most important demands when an emergency arises.

Skilled labor shortage

We are told here that the supply of skilled workers is still very short, and that essential and non-essential industries are in sharp competition for their services. The plans to implement the potential Marshall Plan are expected to involve discussions about the need for skilled workers in certain industries. At this time, early in the Special Session, Congress shies away from the suggestion of general man-power controls. The demobilization of the armed forces has left a huge reservoir of workers within the country. Their absence as soldiers and sailors during the war made manpower controls imperative.

It is assumed any revival of controls at this time would stir the Labor Unions to active opposition. It is true the President has suggested he be given authority to fix "such wage ceilings as are essential to maintain the necessary price ceilings," but it is anticipated that almost any renewal of price controls will force a check on wage increases, and, in some instances, a holiday on wage increases. Another Labor Union campaign for wage increases is supposed to be around the corner.

Controls will come

Despite the uproar about the controls demanded by the President, it is deemed certain they will be authorized. It is incontrovertible that the European Recovery Program can be successfully initiated only by the system of allocations of steel and other scarce materials, largely used by the heavy construction industries as well as the utilities, and similar units of the economy. It is assumed the heavy industries and utilities and their various cousins of the economy will be given priorities on steel and other critical materials.

Commerce Department reveals the domestic demand by the report which showed that electric, gas, and rail utilities have spent far more money for new plants and new equipment in 1947 than the manufacturing industries. The annual rate of expenditure is estimated at $2,000,000,000 at the end of this year.

As the result of an informal conference among engineers in New York, a group of industrial executives have made an off-the-record proposal to Congress that the operation of the Marshall Plan be speeded by subcontracting the whole job to American business firms on the same basis as American war-production was handled. It is suggested the delays, troubles, and inefficiencies, which have been prevalent in some places and jobs in Government construction work after the war, can be avoided by specific time and cost schedules, and by the arrangement and administration of contracts under the direction of competent personnel.

The chief troubles now seen as barriers to maximum results are: (1) that fees for supervision provide only for hiring minimum technical grade engineers, and do not provide for employing engineers with salaries over $9,000 a year; (2) budgets provided for jobs are estimated by Federal agencies unfamiliar with actual prices of current transactions for available materials, many of which are above openly quoted trade prices; (3) scarcities of skilled employees in crafts and trades mean that premium inducements have to be offered to get the best men, and these inducements cannot be offered on Government contracts.

The persons who have been negotiating with the Congressional group suggest that in administering the Marshall Plan full freedom be given engineers to use short-cuts wherever they can be used economically; to use substitutes, such as light metals where heavy metals are short; to use new and uncodified building materials where scarce short-supply materials will otherwise be specified; and, in general, to use individual responsibility and skill for classified red tape and formal specification. There is no doubt the suggestions are sound, from a business standpoint; and that they are intended to give aid in a troublesome position. The difficulty is that some of the Government practices the engineers would eliminate are almost inseparable from Government procedure; not because Government wishes to be stubborn and stupid, but because the assumed protection of the public funds and public interest requires the red tape and devotion to apparently needless detail in order to avoid such glaring scandals as have developed in the investigation of the contracts which brought the name of Gen. Meyers, second highest officer of the Air Corps during the war, into public discussion.

The President's speech

You probably have read and heard that the reception given to the President's address at the opening session of this Special Convocation of the Congress was the coldest and least enthusiastic that has been accorded to any President's words within the memory of any

IT WAS publicly announced by Warren Francis (Washington correspondent, Los Angeles Times), president of the National Press Club, in the presence of Gen. Ike Eisenhower and Lt. Gen. W. Lawton Collins, that Gen. Collins is the new Chief of Staff. Over 500 members of the club heard the statement. Gen. Eisenhower was sitting next to Francis; Gen. Collins accepted the announcement by arising and bowing an acknowledgment. Two days later, at an extraordinary press conference called by the President at 9 in the morning, the President announced the appointment of Gen. Omar H. Bradley. It is general gossip in Washington that Truman has been cold to Eisenhower since his candidacy for President has become an actual equation in current politics. The question in the Capitol now is . . . was the early morning extraordinary announcement of Bradley's appointment made to slap down Eisenhower's acceptance of Collins' presumed appointment? It is a vivid example of the bubble, bubble, toil and trouble, seething in Capitol politics.

professional observer. The mousily polite applause was that faint courtesy which damns, and was the conventional greeting which is worse than none. Rep. Crosser, of Ohio, Democrat, slept so candidly that he repeatedly gave cause for distress because he was on the point of tumbling out of his chair, and falling on his face; Sen. Bob Taft, the Republican bellwether, looked as if he might any moment let out a long and bored yawn. One could not help wondering what the nearby Diplomatic Corps thought about all this. Even the Galleries, at least half filled by women, were dull and apathetic.

Truman, dapper, friendly but unimpressive as a man, however much his office gives him distinction, is not able to play up to the world-shattering implication of power and dramatic significance.

Congress has a healthy distaste for reimposing controls, and is not enthusiastic about relief for Europe. But it seems certain that essentially what the President asked will be supplied. This means, in essence, Congress is aware of an emergency, an emergency springing out of the world situation as well as conditions at home; and it is not entirely unlikely that we will be forced into the situation which will require that Congress devise a law which in name or substance will declare a State of Emergency. Who will be selected to administer the law, unquestionably will be the factor that will join the issue which may determine the direction in which our political system will head in the future.

Control by military?

This issue probably will be the battleground for the great struggle ahead in Congress. The military sincerely hold the administration of controls should devolve upon them, in the light of the crisis unfolding in world affairs. In civilian clothes, and on leave as officers, Generals, Colonels, Majors, and lesser ranks, are plentifully woven into the fabric of the organization of the civilian Government agencies.

Gen. Eisenhower is regarded as the most likely potential for nomination on some party ticket for the Presidency. We are told here he is popular with the veterans. Gen. McArthur is unpopular with veterans, according to Washington estimates, but has made a record that is almost flawless as an Administrator in the Asiatic area. The politicians are beginning to talk more in terms of candidate popularity than in the social, political, and ideological significance of the popular candidates.

Side by side with apprehension about the danger of Communism, we are beginning to hear rumbles of fear of Fascism. In Congress itself there are men like Bertrand (Bud) Gearhart, of the San Joaquin Valley in California, one of the most powerful members of the Ways and Means Committee, and a member of the Republican Policy Committee, who thinks, and says, it is high time those who believe in our pristine Democracy should boldly stand forth and demand that our system be kept headed straight for individual liberty; freedom to do business without interference; freedom to live and do business competitively; and freedom to do business under the system of Capitalism. Gearhart, unlike many others, would not give an inch to any of the modifications introduced by the New Deal, or others. He holds we should revive the system which has made this country capable of being pushed into the role of world savior. There is little doubt this philosophy of undiluted Democracy, without modifications of British Socialism, Russian Communism, Fascism, or any other ism—just pure and simple and almost outmoded American Democracy, will play a striking part in the debates ahead in Congress.

Opening session impressions

The opening assembly of the Special Session in minuscule was the concentrate we call the United States of America. It was a county fair, a political convention, and a business meeting, with much circumstance but no pomp. It faintly reflected the past, vividly incarnated the present, and adumbrated the future: history—romance; the living pulse; and ominous portents of what may come. It seems important to this reporter that you, as a business or professional man, should feel what happened here because it may give you the feel of what is happening in your America. Like the myriads of wires on the switchboards of a gigantic telephone exchange, this particular day of the special session of the Congress focused within the House all the various and complicated interests that are shaping the destiny of the United States. Only God knows what the mechanism of Government will do with the load.

With the retirement of Gen. Eisenhower it has been announced that Gen. W. Lawton Collins becomes Chief of Staff. (See box on preceding page—Ed.) His appointment is regarded as a triumph for those in and out of the Army who believe in rigid regimentation, such as will come with the Universal Military Training Program. The more natural sequence of succession would have brought the appointment to Gen. Omar N. Bradley, head of the Veterans' Bureau, idolized by GI's, regarded as next to Eisenhower the best soldier in command in Europe, and less definitely a disciple of regimentation.

There is a strong and substantial element in Congress, and apparently elsewhere, which earnestly believes the stupendous crash must come sooner or later as the result of the disorganization of the world, and that this disorientation will be absolutely unavoidable in the end, and that it may be better to let it come now, rather than later. They think we have reached the end of a millenium, and that we are feebly trying to fend off the inevitable throes of change.

Foreign relief may backfire

There is still another group which holds that the relief we may give to Europe and Asia must be of such volume, and be extended over such a length of time, and in effect be so futile, that the deprivations we will suffer by direct and indirect reactions will gradually take away from us so many supplies that our way of life will be changed. They think we will be compelled to do with less, reduce the scale of our living, and permit our standards of life to be materially and permanently lowered. It was pointed out by Sen. George Malone, of Nevada, that the network of trade agreements negotiated by the Department of State, which in most instances have cut our imposts 50%, have opened our markets to the goods produced in countries with much lower standards of living and lower wages, whose producers may now flood our markets with a competition we cannot meet unless we reduce our wages and cut our costs. The reduction in duties is defined by the Department of State, and others, as a part of our effort to bring relief to those peoples of the world who have no dollars to buy our goods which they need. The effect is that we permit them to send their cheaper goods to our markets to get our dollars so they may buy from us goods we will be forced to make more cheaply by reducing our wages and living standards that we may bring them relief and sell them our goods. The whole tendency is, of course, to depress our standards. The program has a curious appeal to the two extremes of current socio-economic and political ideologies. Our New Dealers—who blend into the Social Democracy of Britain and into the Communism of Russia—honestly think it is essential we should bring down our standards in order to help to lift the standards in those areas where the levels are lower than ours. On the other hand, the most conservative element of what for the want of a better term we call Big Business, also believe in those controls which will introduce foreign competition, open foreign markets for export, reduce wages here, and place tighter reins on Labor Unions, and build a containing wall around Smaller Business.

The quadrennial election year ahead affords the political genius of this country tremendous opportunity. It is a challenge to great patriotism as well as to great intellect. Thus far Washington has not become aware of any person with the quality of epochal leadership which seems to measure into the stupendous job. There are those here who wonder if any human being is big enough to fill the space.

Miscellaneous

Port interests of Boston, Baltimore, Philadelphia, Norfolk, New Orleans and New York, have joined the American steamship industry in fighting the St. Lawrence seaway project. The opposition is based on the fact that the projected 27-ft. depth of the proposed canal would prevent nearly all American ships from using it when carrying a "pay load." Fog and ice also would prevent use of the seaway 6 months of the year. The bill, S. J. Res. 111, has been reported out of Committee, but does not go before the Congress until a report is filed by the Senate Foreign Relations Committee, which is expected in January,

just after the present five-week session ends.

It is expected the Rockwell bill, H. R. 2973, urged by Mike Straus, which extends power cost repayment periods on Reclamation dams, will be reported promptly and passed by the House. But unless all signs fail it will have tough going in the Senate Public Lands Committee, where it is expected to be snagged until well into next year.

A studious Congressman made a quiet canvass of Government agencies to find out if the pressure upon the taxpayer from Marshall Plan expenditures had stirred any department to reduce its budget. He found they all were striving to get even more, on the plea they had special duties imposed upon them by the Marshall Plan, and because they felt Congress would not dare to be too economical in an election year.

CAA to Operate Landing Aid Experiment Station

THE CIVIL Aeronautics Administration will assume supervision of the Landing Aids Experiment Station at Arcata, Calif., on Jan. 1, 1948. The station will continue to be operated by Transocean Air Lines, as in the past, under contract with the Federal Government. The transfer of supervision to the CAA from the U. S. Navy will be largely a "paper" change, involving little or no difference in operations or policy at the station.

Arcata, 290 mi. north of San Francisco near Eureka, was chosen for secret experiments with fog dispersal equipment called "FIDO," with radar control of aircraft, and with poor-visibility airport and approach lighting systems. Arcata is subject to frequent, heavy fogs. FIDO experiments were outlined in WCN for May, 1946.

After the war, experiments with bad-weather landing aids were continued under joint sponsorship of the Army Air Forces, the U. S. Navy, the Civil Aeronautics Board, the Civil Aeronautics Administration, the Air Transport Association, and the Air Line Pilots Association. Funds were provided jointly by the Army and Navy, with the Navy supervising the contract. After January 1, the CAA instead of the Navy will supervise the contract. The same sponsorship will continue.

Equipment now installed at Arcata includes a FIDO installation, several types of high-intensity lights, an instrument landing system, and ground controlled approach radar facilities.

Kiewit Opens Oregon Shop

PETER KIEWIT SONS CO. has established a storage and maintenance shop at Redmond in central Oregon. Headquarters of the firm are in Omaha, Neb., but in recent years the company has been active in the Pacific Northwest and the Redmond location was selected as a central one from which equipment could be shipped to various projects.

Bids to Be Advertised on Western Reclamation Projects This Month

PROJECTS for which invitations to bid have been, or will be, sent out by the Bureau of Reclamation during December are for completion of the Anderson Ranch Dam northeast of Mountain Home, Idaho; for furnishing and installing pipeline and storage tanks on the Boulder Canyon Project, Nev.; for construction of 30 mi. of transmission lines in Arizona on the Davis Dam Project; for construction of structures, pipelines and earthwork on the All-American Canal Project near Indio and Coachella, Calif.; for construction of 8 pumping plants near Merrill and Tulelake, Ore., on the Klamath Project; for earthwork and structures on 3.5 mi. of the Locket Gulch Wasteway near Nyssa, Ore., on the Owyhee Project; for construction on 14.5 mi. of the Friant-Kern Canal on the Central Valley Project in California; for construction of 36 mi. of transmission line in east central Wyoming on the Missouri Basin Project; for construction of the Muddy Ridge Tunnel and portions of the Wyoming Canal near Pavillion, Wyo., on the Riverton Project, and for construction of five steel penstocks on the Davis Dam Project west of Kingman, Ariz.

Bid calls expected for January and February are for the construction of two concrete pumping plants and earthwork and structures for 14 mi. of laterals on the Yakima Project, Wash.; for construction of the arch-gravity concrete dam and a power plant near Coram, Mont., on the Hungry Horse Project; and for construction of the Smoky Hill earthfill dam near Hays, Kansas on the Missouri Basin Project. Expected bid calls for canal earthwork and structures are for 13.6 mi. of the Delta-Mendota Canal near Fresno and 17.2 mi. of the Friant-Kern Canal near Porterville, Calif., on the Central Valley Project; for 10 mi. of the Horsetooth Feeder canal, including a diversion dam on the Big Thompson River, a one-mile tunnel and 12 concrete siphons near Loveland, Colo., on the Colorado-Big Thompson Project, and for 12.5 mi. of the Cambridge Canal on the Frenchman-Cambridge Unit of the Missouri Basin Project in northwestern Nebraska.

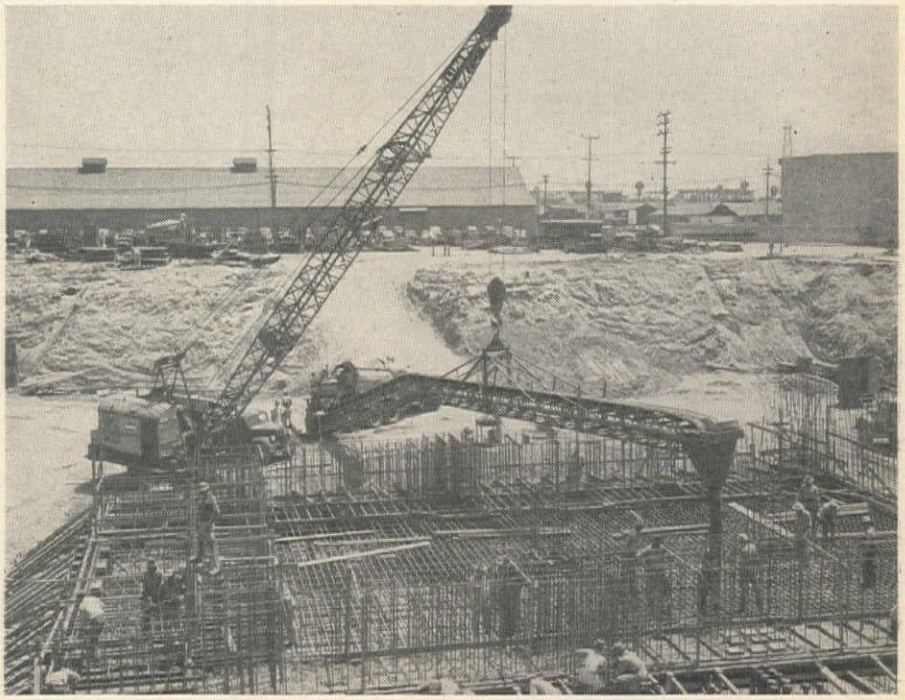
Bids Asked on Medicine Creek Dam in Nebraska

A CALL for bids has been issued for the construction of Medicine Creek dam in Nebraska's Republican River Valley by the Chief Engineer's office of the Bureau of Reclamation. The dam is to be constructed near Cambridge, Neb., scene of a devastating flash flood in June which took 13 lives and caused property damage in excess of $16,000,000.

Medicine Creek Dam is to be a rolled earthfill structure 102 ft. high with a crest length of 3,600 ft. Total excavation will amount to 3,500,000 cu. yd.; the em-

CRANE MANEUVERS CONVEYOR FOR CONCRETE FOUNDATION PLACEMENT

IN POURING the foundation of Los Angeles Department of Water and Power's Wilmington steam power plant, Guy F. Atkinson Co., contractor, uses a Lima crane to place a 100-ft. conveyor with 24-in. belt exactly where the next pour is to be dumped. The conveyor has a hinge point 50 ft. from the hopper, and wheels at the loading end to assist the crane in steering the conveyor.



bankment will require 2,500,000 cu. yd. of fill. Included in the construction is a concrete spillway at the left abutment of the dam and a 7.5 mi. gravel-surfaced access road. Bids are to be opened at the Bureau of Reclamation office at Indianola, Neb., at 10 a. m. on Dec. 23.

The reservoir, to be created by the construction of the dam, will regulate water for flood control, irrigation, and silt control. Designs provide for a 40,000-ac. ft. capacity at normal water surface elevation and for an additional flood storage capacity of 53,000 ac. ft. The spillway is to have a capacity of 139,000 cu. ft. per sec. at maximum water surface elevation.

The dam is part of the Frenchman-Cambridge unit of the Missouri Basin project which includes Enders dam now being constructed under a $4,109,927 contract with the Wunderlich Contracting Co. When completed, the combined storage provided by Medicine Creek and Enders dams will permit irrigation of approximately 53,000 ac. of land in the Republican Valley. Both dams are an integral part of the over-all development plan for the huge Missouri Basin.

Morrison-Knudsen Gets Salt Lake Sewer Award

LOW BID on the Salt Lake County suburban sewer project was submitted by Morrison-Knudsen Co., Inc., and Winsor Construction Co. The bid of $3,134,417 was approximately $500,000 higher than the engineers' cost estimates.

Because of the excess of the bid over the estimates, revisions will have to be made in the project or arrangements made to increase the amount of the revenue bond contract with Lauren W. Gibbs of Salt Lake City and associates in Omaha, Nebr.

One other overall bid of $4,085,268 was submitted by the United Concrete Pipe Co. and Stolte, Inc. Five contractors bid on parts of the project.

The bids received by the Salt Lake County Commission did not include a proposed sewage disposal plant which will cost approximately $500,000. Plans and specifications for this unit are now being prepared by Caldwell, Richards & Sorenson, the project engineers.

The Editor's Mail...

Estes Park, Colo.
Nov. 12, 1947

Dear Sir:

I would like to order a subscription to your magazine for my husband, Clayton W. Rockwell. As I picked up a copy of the magazine in a **beauty shop,** I have no idea how much the subscriptions are or the length of time they run. So if you will send me this information I would appreciate it.

Yours truly,

Mrs. Clayton W. Rockwell

Note: *Western Construction News* is found everywhere!

Sorry—Two Errors

REGRETTABLY, two errors have appeared in recent issues of *Western Construction News,* and we take this opportunity to present the corrected statements:

On page 104 of the August issue, we stated that John R. Austin Construction Co. was driving a highway tunnel near Golden, Colo. Actually, this $332,878 contract is held by Larson Construction Co. of Denver, and equipment shown in the picture on the above-mentioned page is rented from the Austin company.

And on page 79 of the November issue, in reporting the convention of the Structural Engineers Association of California, we listed among the speakers, S. B. Barnes. We identified him as being associated with the Portland Cement Association. In reality, he is a consulting engineer in Los Angeles, and Hugh D. Barnes is district engineer for the Portland Cement Association in the same city. Our sincerest apologies all around!

—Ed.

OBITUARIES...

Ezra F. Scattergood, 76, nationally known electrical and hydraulic engineer, died Nov. 15 of heart disease in Los Angeles. He was general manager and chief electrical engineer of the power unit of the Los Angeles Department of Water and Power from 1909 until his retirement in 1940 and was the dominant figure in the building of the far-flung $315,000,000 Los Angeles power system. He had been a consultant to the power division since his retirement. Among the major accomplishments in engineering fields credited to him were a large part in planning of the Owens Valley-Los Angeles Aqueduct and the Hoover Dam-Los Angeles power transmission line.

* * *

Henry A. True, 64, a director of land purchases of the Texas Oil Co. and former Wyoming state engineer, died recently of a heart attack in his home at Shelby, Mont. True had engaged in railroad and irrigation engineering in various parts of the United States and Cuba. His death came shortly before his scheduled retirement after twenty years' service with the oil concern.

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Clayton V. Welch, former head of the Los Angeles, Calif., Department of Building and Safety, and an employee of the City Building Department for 32 years, died Sept. 25. Welch is noted for the framing of the first comprehensive city building ordinance for Los Angeles.

* * *

H. H. Boomer, 91, retired railroad contractor, died recently in Spokane, Wash., of a sudden heart attack. He was a member of the old firm of Winters, Parsons & Boomer of Butte and Spokane which did a considerable amount of pioneer railroad building in the Northwest. Boomer was later associated with the construction of the Bucks Dam on the Feather River in California, extensive highway work for the state of Idaho, bridge work for Montana and other construction projects in the West.

* * *

Fritz Ziebarth, Long Beach, Calif., contractor, died recently following a heart attack at his Palmdale Ranch. Ziebarth was one of the West's outstanding contractors for power lines and electrical transmission systems. Among contracts he successfully undertook were for the electrical installations at Shasta and Hoover Dams, and for the lines from Parker Dam to Arizona and California.

* * *

Cecil O. Dale, office engineer on the Bureau of Reclamation's Parker Dam Power Project, died recently at Los Angeles, Calif. Dale had served in similar capacity on the Minidoka Project, Ida., and the Elephant Butte Power Project in New Mexico. From 1920 to 1933 he engaged in building design and construction in Los Angeles.

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Frank C. Sewell, 59, treasurer of the W. A. Bechtel Co. of San Francisco, died recently at his home in San Francisco. Sewell, associated with Bechtel since 1908, had taken an active part in the company's participation in the construction of Hoover Dam, the San Francisco-Oakland Bay Bridge and the Arabia pipeline.

* * *

Peter E. Fluor, president of the Fluor Corporation, Ltd., construction company for the oil, chemical, and allied industries, died at his home in Anaheim, Calif., on Sept. 10. He was associated with the company for thirty-five years and helped this father, J. Simon Fluor, formulate the present corporation.

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Clarence B. Eaton, 66, partner in the construction firm of Eaton & Smith, San Francisco, died recently. He went into partnership with J. M. Smith in 1914 and was one of the originators of the Northern California chapter of Associated General Contractors.

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John H. Gray, Jr., 81, retired former chief testing engineer for the city of Oakland, Calif., died recently at his home in San Francisco. He was also formerly testing engineer for the city of San Francisco previous to taking a similar position in Oakland.

* * *

Stanley M. Hands, 58, chief testing engineer for the city of Oakland, Calif., died last month at his home after a week's illness. He was at one time city engineer for Iowa City, Iowa.

MASTER MECHANIC

Where They're Working:

AMONG THE master mechanics whose work has recently been reported to *Western Construction News* are **Orvel Banks,** with George Pollock Co. of Sacramento, at the gravel plant furnishing aggregates for the Friant-Kern Canal; **Joe Fink,** with Peter Kiewit Sons' Co. on its outfit "G" on the Friant-Kern Canal, and **Wayne Brockelsby** who is mechanical superintendent on the same job; **G. T. Long,** with Peter Kiewit Sons' Co. at Friant-Kern, on their outfit "A", and **S. J. Hamby,** who is shop foreman in the same outfit; **Paul Havens,** with the Griffith Co. of Los Angeles on highway construction, from Bakersfield 4 mi. northerly; and **Les Hunt,** with the Gunnar Corporation and J. E. Haddock of Pasadena, on construction of Highway 99 between Fresno and Fowler, Calif.

In Montana, **Jerry Sheehan** is master mechanic on Peter Kiewit's 6.9-mi. road job between Balfour and Bridger, and in Washington, **Lester Schuh** is mechanical foreman for General-Morrison-Shea on construction of Ross Dam.

"Skyhook" to Motivate Mount Hood Aerial Tramway System

MT. HOOD AERIAL Transportation Co. has been authorized by the U. S. Forest Service to construct a new type of aerial tramway between Timberline Lodge and Government Camp on the west slope of Mt. Hood about 50 mi. east of Portland.

The equipment to be used will be the newly developed "skyhook" which has recently been perfected by Pointer-Willamette, Inc., of Portland for use in logging operations. The system includes a self-powered car operating on fixed cables and capable of transporting heavy loads. Present plans contemplate the use of one power car with several passenger carrying cars which will permit one car to be carried along the tramway while others are being loaded and unloaded.

A Master Mechanic Says:

Sirs:

The expiration of my subscription to *Western Construction News* was in no way caused by the quality of, or dissatisfaction with the magazine. You will please note that my subscription has since been renewed.

It is the best magazine I have read pertaining to construction, and all the angles. I hate to miss an issue regardless of what my work may be at the time. It keeps one well informed at all times.

Resp. yours,
L. B. COLEMAN,
Estes Park, Colo.

Diesel Power Units Operate Much Postwar Construction Machinery

DIESEL POWER is daily achieving greater prominence in the field of construction equipment, and a thorough knowledge of its operation and its many applications is an essential for the competent postwar master mechanic. Pictured here are two recently observed applications of the Diesel engine in the West.

Above is a Cedarapids portable primary and hammermill plant owned by Don Kaser at Girard, Kans. It crushes 88 tons of rock per hour and is powered by two 6-cylinder General Motors Series 71 Diesels mounted together and driving a single shaft through a 1.77-to-1 reduction gear box. This twin engine is rated at 260 brake horsepower at 1,600 rpm. Each engine has individual throttle and clutch controls. Power is furnished through a telescoping shaft, which in turn drives the pulverizer by a series of V belts. Heavy duty air cleaners on the engines protect them from the exceedingly dusty conditions always common to rock crushing work. An auxiliary power unit mounted on a platform at the head of the hammermill plant furnishes screen and conveyor driving energy.

The lower picture shows a portable well servicing rig operated by the Standard Oil Co. of California in its Southern California fields. The rig is operated by a double drum hoist mounted on a White truck in which a Hercules model HXD Diesel engine is installed. The derrick is laid down over the unit for traveling and can be raised and telescoped upward into working position in about ten minutes by the power unit. The machine has a capacity up to 7,700 ft. of wet 2½-in. tubing.

Just as the early day master mechanic who was mostly a blacksmith gave way to the expert on steam operation, and he in turn to the man who understood the workings of a gas engine, so the application of Diesel power is engaging the attention of more and more mechanical specialists.

NEW BOOKS...

APPLIED ARCHITECTURAL ACOUSTICS—by Michael Rettinger, engineering department RCA Victor Division, Radio Corporation of America. Published by the Chemical Publishing Co., Inc., Brooklyn 2, N. Y. 189 pages, 5½ x 8. Price $5.50.

How to plan for good hearing conditions in any type of room is the theme of this book, which gives an alphabet of architectural acoustics. Designed as a handbook for architects and contractors, the theoretical aspects of the text would also be of interest to students and engineers. Chapters on Geometric Acoustics, Reverberation, Sound Insulation, Acoustic Materials, Sound-Stages, and many others are included. This book would be an excellent aid in the prevention of excessive room reverberation, echoes or noise, which might mar music or the spoken word.

PRINCIPLES OF ELECTRICAL ENGINEERING—by T. F. Wall, head of electrical engineering department, University of Sheffield. Published by the Remsen Press Division of the Chemical Publishing Co., Brooklyn 2, N. Y. 563 pages, 5½ x 8. Price $8.50.

Basic principles of the science of electrical engineering are the subject of a comprehensive, though compact discussion in this book. Methods of solution of a wide range of technical problems are shown, and new developments in applications, testing, and materials are also covered. Identity of the principles relating to both heavy-current and light-current engineering practice is emphasized throughout the book.

HEAT PUMPS—by Philip Sporn, E. R. Ambrose, and Theodore Baumeister. Published by John Wiley & Sons, Inc., 440 4th Avenue, New York, and Chapman & Hall, Ltd., London. 188 pages, 5½ x 8. Price, $3.75.

A clear technical treatment is offered here on the subject of the development of the heat pump. Written by the president of the American Gas and Electric Service Corporation, an air conditioning engineer, and a consulting engineer and college professor, it discusses the progress made in adapting the pump not only to building heating and cooling service, but also to such industrial processes as the evaporation and purification of liquids, the drying of solids and the simultaneous chilling and heating of process fuels. Questions and data found in the book are thoroughly practical.

ELEMENTS OF RAILROAD ENGINEERING—by William G. Raymond, Henry E. Riggs, and Walter C. Sadler. Sixth Edition. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 442 pages, 6 x 9¼. Price $5.00.

The practical approach of previous editions is preserved so that this book serves not only as a textbook for students specializing in railroad engineering, but also as a general survey of the subject for engineers who want to understand the basic principles of railroading. There are two new chapters on streamlined trains and on power and passenger equipment. Tables have been revised to cover the enormous passenger and freight business of the war years. Many sections were rewritten to include information of current usefulness.

PERSONALLY SPEAKING

Eugene Sternberg, Czechoslovakian architect and town planner, has been appointed associate professor of architectural design at the Denver University School of Architecture. He has been active in the replanning of bombed areas in London since the war and worked on schemes for the reconstruction of his home country. He was formerly on the staff of the department of city and regional planning at Cornell University. Other appointments at the University of Denver are of **Donald W. Decker** as instructor in building construction, and **Garwood Andresen** as associate professor of building construction and contracting and in charge of building methods and material research.

William A. Peterson has been appointed by the U. S. National Forest Service as supervisor of the Plumas National Forest with headquarters at Quincy, Calif. He is an expert in forest fire control and recreation problems. Peterson, who had been supervisor of the San Bernardino National Forest in southern California for the past three years, will replace **Carl A. Gustafson** who was recently promoted to assistant chief of fire control in the Washington, D. C. headquarters of the Forest Service.

The Colorado State Highway Dept. has discharged **Tom Ledgerwood** of Craig, who had previously been suspended as maintenance superintendent in northwestern Colorado, after a complete investigation. Ledgerwood was accused of using state-owned highway equipment to build himself a home at Craig. The position will be filled by **Glen K. Cummings,** who has been with the department for 14 years in the Denver area and served as chief of a state oiling crew for seven years.

Ralph C. Pybus, Commonwealth Construction Co., Ltd., Vancouver, B. C., was elected president of the Vancouver General Contractors Association at their annual meeting recently. **F. J. Dawson** and **L. G. Murray** were elected as vice-presidents. **H. H. Johnson** is past president. Directors are **John Tucker, M. C. Cameron, J. E. Amundson, W. T. Lee, R. A. Hall, B. McAlister** and **A. J. Armstrong.**

R. K. Durant is construction engineer and **S. S. Leonard** is field engineer for the Bureau of Reclamation on the Friant-Kern canal, part of the Bureau's Central Valley Project in California. Division engineers are **G. W. Manly, E. C. Smith, J. R. Lawrence** and **J. A. Fraps. E. C. Fortier** is engineer in charge of the distribution systems, **L. E. Cramer** is managing the office engineering and **H. C. Cox** is the design unit head.

Thor M. Peterson, general contractor, Port Alberni, B. C., has expanded with a view to entering the contracting field in British Columbia as a whole. In the past his activities were confined to northern Vancouver Island area. He has incorporated as Thor M. Peterson, Ltd., and has appointed **E. R. Pudsey** as manager and estimator at a branch office which has been opened at Granville St., Vancouver.

O. L. Norman, who served as coordinator of utilities under the War Production Board in San Francisco, and also as a Lieutenant Commander in the Navy, has been named general manager of the Salt River Valley Water Users' Association, with headquarters in Phoenix, Ariz. **H. J. Lawson,** formerly general superintendent and chief engineer has been made superintendent of operations, and **F. L. Rowe,** formerly superintendent of power is now chief engineer. **L. L. Lee** has been advanced from the position of office engineer to assistant chief engineer, and **A. C. Messer** has been named superintendent of power.

Orville Kofoid is now associate professor of structural engineering in the Civil Engineering Dept. of Oregon State College at Corvallis, Ore. He was formerly head of the structural design section of the Thirteenth Naval District and most recently design engineer for Homer M. Hadley, Seattle, Wash., consulting engineer.

"Bert" Givan has retired after 24 years of service as a consulting engineer in Sacramento, Calif. He was the first president of the Sacramento section of A.S.C.E. and served a long term on the board of directors of the Sacramento Municipal Utility District which he had originally helped to organize.

Jean L. Vincenz, for the past five years with the U. S. Army Engineers in both a military and civilian capacity directing army base and airport maintenance, has been named director of public works of San Diego County, Calif.

Stephen A. Wallace, Sr., highway engineer for the Public Roads Administration, has retired after 35 years of government service. His tenure with Public Roads has been monumented by his location of many well-known National Forest and Park highways including the well known Trail

Ridge Road in Rocky Mountain National Park, the Walnut Canyon highway at Carlsbad National Park and others. Wallace transferred to the Bureau of Public Roads in 1919 from the U. S. Forest Service. He will make his residence in Denver.

* * *

Louis Goss has been appointed by the city council of Redondo Beach, Calif., as city engineer. Goss formerly served as manager-engineer of Brawley and as administrative official for Monterey Park in California. For the past year he has been in the Los Angeles office of the War Assets Administration.

* * *

Art Showman has been promoted to principal engineer and head of the planning branch of the U. S. Army Engineers, Sacramento, Calif., district. **F. G. Christian,** former head of the planning branch, is now deputy chief of the engineering division. **Henderson McGee,** the former deputy chief of the engineering division, is now working on special projects for the district engineer. This work includes investigating and correlating the behavior of soils and other materials under various destructive forces including that of atomic bombs.

* * *

Mark S. Edson, supervising hydraulic engineer for the Division of Water Resources for the Sacramento, Calif., district, has retired after 25 years of service with the division. After wide experience in construction and hydraulic engineering both in the United States and abroad, Edson became an employee of the state in 1922 as a junior hydraulic engineer.

COLONEL JOSEPH S. GORLINSKI has assumed duties as head of the Sacramento, Calif., district, Army Corps of Engineers. His last assignment was in China as chief engineer on General Wedemeyer's staff.

R. D. Canfield is now district engineer for the Arizona State Highway Dept. at Tucson. He will work on construction and maintenance for District No. 4.

* * *

Charles H. Rader, with the Bureau of Reclamation on the Tucumcari irrigation project, New Mexico, has received a new rating as acting construction engineer. He will act in this capacity for the remainder of the current construction work.

C. E. Wood has resigned as maintenance engineer with the Nevada State Highway Dept. at Carson City. Wood assumed the job in 1941 after being division engineer at Ely, and previous to that, field engineer at Carson.

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E. A. Rolison, appointed as city manager of Redwood City, Calif., returns to the position he held fifteen years ago. Rolison has served as manager of several California cities since 1930 and during the war was in the federal service.

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The Tacoma, Wash., chapter of A. G. C. has announced their new manager as **Clarence Todd,** formerly assistant manager of the Seattle chapter. He replaces **W. A. Osborne.**

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A. V. Dienhart is now field engineer for the Northern States Power Co. at Sioux Falls, S. D. He will supervise construction of a steam power plant which the company is building at Sioux City.

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Henry R. Domby, formerly with the Bureau of Reclamation in Denver, is now general manager of the branch of the Universal Motors Co. and Moffat Engine and Supply Co. at Rifle, Col.

* * *

John H. Bjork is now construction engineer for the Bureau of Reclamation on construction of the All-American Canal near Banning, Calif. His work involves design of the distribution system for the canal.

SUPERVISING THE JOBS

A. Aegerter and **W. E. Bradbury** are general and assistant superintendent, respectively, for the James I. Barnes Construction Co., Santa Monica, who have the contract for construction of the hospital for the Veterans' Administration at Fresno and Clinton Sts., in Fresno, Calif. The $5,645,100 structure will be of 250-bed capacity, seven stories high, air conditioned, and will be built of structural steel with concrete terra cotta facing. **H. Goldsworthy** is the project manager for the Barnes company and **Leslie Liess** is the job engineer. **L. B. Westfall** is acting as general carpenter foreman, **Roy Eastburn** is office manager, and **Roy Webb** is expediter. **J. L. "Jack" Newman** is the resident engineer. **Gene Richards** has the sub-contract for the excavation work, and **Jack Summers** is his excavating foreman. Anderson & Rowe, San Francisco, have the sub-contract for plumbing, heating and ventilation. **S. L. Berg** is their superintendent, **C. G. Crouch** is the plumbing foreman, and **R. W. Beasley** is the labor foreman.

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H. Earl Parker, Inc., Marysville, Calif., have the contract for construction of the Big Dry Creek Reservoir near Clovis, Calif., being built for the Bureau of Reclamation. **A. G. Britton, Jr.** and **J. B. Martin** are the labor foremen on the job. **R. E. Ebersole** is inspector, **A. J. Sadler,** structural engineer, and **M. S. Kelly** is resident engineer for the Bureau. **Jack Newman** is the engineer for this Reclamation area. **F. D. Westcott** is superintendent for McCoy-Butler of Marysville who have the sub-contract for the concrete work on the job. Additional personnel for McCoy-Butler are **N. M. Ubick,** cement foreman; **Chester Cordes, John Askins** and **Oscar Church,** carpenter foremen; and **Milo Hardie,** labor foreman. **E. E. Goss** is job superintendent for the San Jose Steel Co., sub-contractor for steel work on the project.

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C. F. Beattie is superintendent and **W. F. Evans** is project manager for National Constructors, Inc., on construction of the Allatoona Dam near Cartersville, Georgia. These principals and others on the project are construction men from the west coast who are helping to erect the 230 x 1280-ft. all-concrete dam. Other Westerners on the job are **William H. Hale** as concrete foreman, and **Roy V. Fultz** as concrete finish superintendent.

* * *

Construction activity on the Friant-Kern canal, part of the Central Valley Project in California for which Peter Kiewit Sons' Co. have the contract, is divided among separate outfits. **W. W. White** is superintendent for "Outfit A" which carries out the structures work. **F. E. Grounds** and **C. J. Barr** are the general foremen, **T. E. Powell** is foreman of reinforcing steel placement, and **Bob McKinney** is carpenter foreman. For "Outfit B" which is handling excavation and grading operations, **C. R. Fowler** is the superintendent and **B. F. Helling** and **G. Q. Walker** are foremen for the grading. **Floyd McLemore** is superintending the activity of "Outfit E" which is concerned with the Monighan Spreader operations. **B. E. Grounds** is acting as assistant superintendent and **H. A. Norris** is grading foreman. **E. C. Smith** is resident engineer for the Bureau of Reclamation for this area of construction on the Friant-Kern canal. **Keith Wasson** is project manager for the contractors for the work of these three outfits and also for the canal lining and siphons work.

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W. O. "Til" Tilford is job superintendent for Peter Kiewit Sons' Co. on construction of the canal lining and siphons on the Friant-Kern Canal, part of the Central Valley Project in California. **Keith Wasson** is project manager, **Jim Garver** is general foreman, and **Jack Stone** and **Gene Hiltenum** are the job engineers. **Vern Brinlee** is labor foreman, **Bill Miller,** forms foreman; **Joe Miller,** trimmer; **Ralph Glanville,** cement finish; **Ray Hultquist,** drains; **Jim Bett,** batch plant; **C. P. Peterson,** rail; and **Chet Corbly** is the truck foreman. **Jim Dunn** is the office manager. Other foremen on the job are **Alb. C. Ansiel, George Harlan, John Thomas, John Scales, Thurman Cox, Dave Christian, John Counter, Ed Chester, Al Chaffin, John Crouse, Neal Snip, Frank Armstrong, Morse Marshall, John Hennessey,** and **Frank Crowder.**

* * *

Frank Cronin is the superintendent and **S. F. Immel** is project manager for the Griffith Co., Los Angeles, who have the contract for construction of 3.5 mi. of the limited access highway north from Bakersfield. Beside the grading and paving work, the job involves erection of an overpass and underpass. **C. E. McCracken** is the bridge superintendent and **J. M. Amos** is the carpenter foreman. Grading foremen are **Jim McNatt, W. B. McDonald** and **J. W. Brigham,** and **T. W. Akard** is foreman for the concrete work. **Walt Nett** is resident engineer for the state.

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Neil Borgquist and **M. W. Stanfreid** are superintendent and project manager, respectively, for the Gunner Corp. and J. E. Haddock, both of Pasadena, on construction along State Highway No. 99 between Fresno and Fowler, Calif. Foremen on the job are **C. E. Jasper,** grading operations, **W. F. Wright,** concrete work; **Sam A. Chuck,** concrete work; and **Thayne Johnson,** carpentry. **J. C. Fuhler** is the office manager for the contractors. **Fred Oliphant** is resident engineer for the state.

* * *

L. B. "Cort" Cortner is the superintendent for constructor Otis B. Pierson, Bellflower, Calif., on his contract for erection of a bridge on the Stockdale Highway 6 mi. southwest of Bakersfield. **Sam Ovesen** is his foreman for the pile driving. **Robert Graham** and **Vernon Smith** are the resident and assistant resident engineers for the state on the job.

Ken B. Selby is field superintendent for Diamond Drillers, Inc., of San Francisco, Calif., who have the contract for drilling and grouting for the foundations of the power house and spillway at Davis Dam, Nev. **R. J. Kangas** is assistant superintendent, **Robert Wheadon,** engineer, **Bill Brownfield,** office manager, and **W. H. Peterson** is paymaster. **George M. Philpott** of San Francisco is supervising the project. Camp accountant is **Paul Tolton.** Responsible for the favorable reports about the commissary at Davis Dam are **Bill Ketron,** camp manager, and **Cecil Missiaen** in charge as chef, with **Duane Both** assisting. The commissary is being operated by the Utah Construction Co. **Earl A. Steiner** is supervising the construction of the housing project at Davis Dam for John Bohannan.

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Robert L. Kenning is the project manager for Guy F. Atkinson Co., San Francisco, on construction of the freeway including erection of an overpass and underpass at Fresno, Calif. **Joseph C. Lawrence** is structure superintendent and **Robert Hart, Lester L. Watson** and **H. B. "Dink" Ward** are carpenter foremen. **K. S. Cornell** is labor foreman on the job and **L. R. Chambers** is the chief time-keeper. Resident engineer for the state is **P. A. Boulton. Charles B. Eckhardt** is the steel foreman for Ceco Steel Products Corp., Los Angeles, subcontractors for steel work on the project.

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Hugh Alexander is superintendent for the Rand Construction Co., Bakersfield, who have the contract from the State of California for construction of 6.1 mi. of the Central Valley Highway between Wasco and Pond. Foremen for the grading operations are **G. M. Gibson, Harry Crawford,** and **Jim Black. Don Evans** is resident engineer for the state.

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Harry Bailes is superintendent for the Geo. Pollock Co., Sacramento, and **Ralph Rockwell** is manager of the company's gravel plant operations on the Friant-Kern canal, part of the Central Valley Project in California. **Dick Wetzel** is plant foreman for night operation and **Bill Colcleaser** is general foreman while **Theodore Lemon** is foreman for the night operation of the plant.

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L. E. Robertson was job superintendent on the construction of a reinforced concrete weir and headgate on the Kaweah River at the head of Deep Creek, 10 mi. east of Visalia, Calif., built at a cost of $18,000 for the Kaweah River Association. **H. H. Holley** was resident engineer. The job, done by force account, was completed recently in two calendar months.

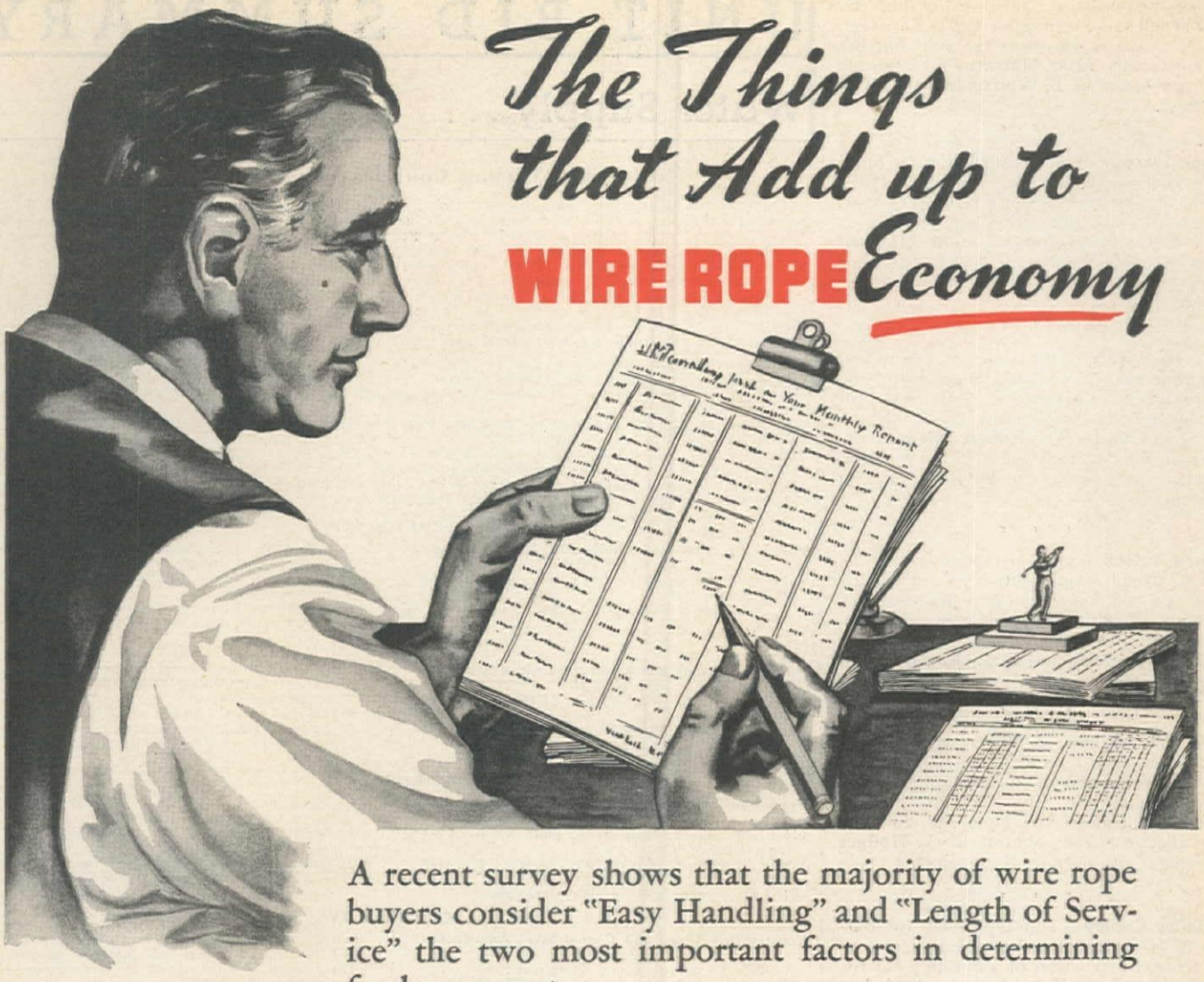
* * *

J. E. Geertsen is superintending the construction of frame and stucco elementary school buildings at 2615 E. Huntington Dr., San Marino, Calif., for the Baruch Corp., Los Angeles. The buildings are being erected under a $357,000 contract.

* * *

E. A. "Jerry" Reed is the superintendent for the Hermann Co., Los Angeles, on construction of field offices for the Richfield Oil Co. on Kern Road in Bakersfield, Calif. **D. Lewelling** is the carpenter foreman and **Jack Bradshaw** is labor foreman for erec-

The Things that Add up to WIRE ROPE *Economy*



A recent survey shows that the majority of wire rope buyers consider "Easy Handling" and "Length of Service" the two most important factors in determining final rope cost.

And more and more wire rope users are finding, by actual experience, that they can depend on Preformed "HERCULES" (Red-Strand) Wire Rope for these two top-ranking features. As it is available in a wide range of constructions – both Round Strand and Flattened Strand – they have *also* found that in "HERCULES" there is a *right rope* for any heavy duty purpose.

If you have not tried Preformed "HERCULES" (Red-Strand) Wire Rope you, too, would like its easy handling, smooth spooling and long life. Give it a chance to *prove* its money saving ability! We invite your inquiries.

"HERCULES"

REG. U.S. PAT. OFF.

RED-STRAND WIRE ROPE

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

ESTABLISHED 1857

5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI

NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE

tion of the one-story, $350,000 building. **H. L. Yarnell** is superintendent for Latisteel, Inc., Pasadena, who have the sub-contract for steel work. **Mike Martin** is foreman for steel work, and **C. T. Whiteside** is the labor foreman.

* * *

Leo Hare is superintendent for the Sapp Construction Co., Inc., Beverly Hills, Calif., on construction of a reinforced concrete and steel, one story fair building at the Fair Grounds, Pomona, Calif. **Maxwell Sapp** is project manager for the job for which the contract award price was $527,-740.

* * *

C. H. Smith is the superintendent and **Jess Masters** is the project engineer for the J. Masters Co., Fresno, on construction of a truck terminal in Fresno, Calif., for the Kenworth Motor Co. **Robert Hines** is the foreman for concrete work on the building which is designed as a reinforced concrete structure, 60 x 100 ft.

* * *

Jack P. Neil is job superintendent for the Del E. Webb Construction Co., Phoenix, Ariz., on the erection of a building for Phoenix Newspapers, Inc., in Phoenix. Carpenter foremen on the job are **Art Zachary, Ed Neil,** and **O. L. Jones,** and **Al Shore** is steel foreman.

* * *

W. W. Fawns is superintendent for Steadman and Powell, Los Angeles, on construction of a building at 52nd Ave. and East 10th St., in Los Angeles, for the Stoddard Cleaners and Dyers. **T. Sartwell** is in charge of the concrete work. **Hodges** is resident engineer on the project.

* * *

Henry Cooley is superintendent for Barrett & Hilp, San Francisco, on their contract for construction of a building for the Pacific Paint and Varnish Co. at Berkeley. **Ben Raffin** is engineer on the job which is just being completed.

* * *

John Bertone is job superintendent for Pacific Iron & Steel Co., Los Angeles, Calif., for the steel construction on a transit shed at berths 6 and 7, Pier A, Long Beach Harbor. **Walter T. Norris** is project manager and **D. B. Bertone** is purchasing agent for the $544,641 project.

* * *

Marvin L. Atkinson is the superintendent for L. H. Hansen & Sons, Fresno, Calif., on their construction of the shopping center at Blackstone Blvd. and Clinton St. in Fresno. The building should be completed before the end of the year.

* * *

J. W. Green is the superintendent for Franceschi Construction Co., San Francisco, on construction of an $85,000 brick and concrete store and office building at Delano, Calif., for the Treanor Equipment Co. **Ross Shelton** is the carpenter foreman on the job.

* * *

Dick Sharp, 53, superintendent for the J. Masters Co., Fresno, Calif., for the past six years, died recently. He had engaged in construction work for 30 years and had been general superintendent on construction jobs for the government in Alaska. A native of South Dakota, he most recently lived in Fresno.

UNIT BID SUMMARY

Water Supply . . .

California—Various Counties—District—Aqueduct

The East Bay Municipal Utility District, Oakland, awarded contracts amounting to $10,421,642 for the construction of Units C, D & E, Second Mokelumne Aqueduct, approx. 47 mi. long in Contra Costa, San Joaquin and Calaveras Counties. Western Pipe & Steel Co. of San Francisco was awarded the contract on Schedule No. I to furnish lined and lined and coated steel pipe for Unit C, at $1,875,903. The same company bid $4,093,671 on Schedule No. II, to furnish lined and lined and coated steel pipe for Unit D, and was awarded the contract. P. & J. Artukovich, Los Angeles, received the $1,095,429 contract on Schedule No. IV to construct the lined and coated steel aqueduct for Unit D. The final award was made to United Concrete Pipe Corp., Baldwin Park, on its bid of $3,356,639, to furnish and install reinforced concrete aqueduct for Unit E. The 67-in. diameter aqueduct will be used to carry water under hydrostatic heads varying between 180 and 510 ft. and will be located on the District's right-of-way. Unit bids follow:

(A) Western Pipe & Steel Co.—(Sch. I) $1,875,903; (Sch. II) $4,093,671; Sch. III) $2,425,511.
(B) P. & J. Artukovich—(Sch. IV) $1,095,429.
(C) United Concrete Pipe Corp.—(Sch. IV) $1,344,270; (Sch. V) $1,058,235; (Sch. VI) $6,059,797; (Sch. VIII) $3,356,639.
(D) American Pipe & Construction Co.—(Sch. VI) $5,965,635; (Sch. VII) $3,439,645.
(E) Artukovich Bros.—(Sch. IV) $1,107,625; (Sch. V) $1,307,255.
(F) Atkinson, Teichert, Bressi & Bevanda & Kettlewell—(Sch. IV) $1,434,348; (Sch. V) $1,158,571.
(G) M. & K. Corp., Fredrickson & Watson, Pollock Co.—(Sch. IV) $1,409,616; (Sch. V) $1,284,698.
(H) Pacific Pipeline, Haddock, & Stolte—(Sch. IV) $1,682,520; (Sch. V) $1,458,260.
(I) Southwest Welding & Mfg. Co.—(Sch. I) $2,131,895.

SCHEDULE I

Furnishing Lined, and Lined and Coated Steel Pipe for Unit C

(1) 55,865 lin. ft. furn. ½-in. plate x 68-in. ID steel cylinders.
(2) 1,826 constr. bells on plate steel cyl.
(3) 54,025 lin. ft. lining 68-in. ID steel cyl. with ½ in. of cem. mortar.
(4) 1,900 coat. 68-in. ID steel cyl. with ¾ in. of reinf. cem. mortar.
(5) 940,000 sq. ft. paint. lined steel pipe sects.
(6) 55,865 lin. ft. del. steel pipe sect. at site of inst.

SCHEDULE II

Furnishing Lined, and Lined and Coated Steel Pipe for Unit D

(1) 1,070 lin. ft. furn. 7/16-in. plate x 68-in. ID steel cyls.
(2) 105,380 lin. ft. furn. ½-in. plates x 68-in. ID steel cyls.
(3) 3,880 const. bells on plate steel cyls.
(4) 112,560 lin. ft. lining 68-in. ID steel cyls. with ½ in. of cem. mortar.
(5) 112,180 lin. ft. coat 68-in. ID steel cyls. with ¾ in. of reinf. cem. mortar.
(6) 116,450 lin. ft. del. steel pipe sects. at site of install.

SCHEDULE III

Furnishing Lined, and Lined and Coated Steel Pipe for Unit E

(1) 67,090 lin. ft. furn. ⅜-in. plate x 68-in. ID steel cyls.
(2) 10,700 lin. ft. furn. 7/16-in. plate x 68-in. ID steel cyls.
(3) 2,450 constr. bells on plate steel cyls.
(4) 75,150 lin. ft. lining 68-in. ID steel cyls. with ½ in. of cem. mortar.
(5) 74,950 lin. ft. coat. 68-in. ID steel cyls with ¾ in. of reinf. cem. mortar.
(6) constr. pipe bends for Pardee Tunnel Outlet.
(7) 77,790 lin. ft. del. steel pipe sects. at site.

SCHEDULE IV

Constructing Lined and Coated Steel Aqueduct—Unit D

(1) 329,500 cu. yd. excav. for trench.
(2) 350 cu. yd. excav. for structs.
(3) 214,100 cu. yd. backfill.
(4) 115,800 lin. ft. install 67-in. ID pipe sects.
(5) 370 constr. bell and spigot joints in pipe, 7/16-in. thick steel cyls.
(6) 3,510 constr. bell and spigot joints in pipe, ½-in. thick steel cyls.
(7) 1 constr. butt-strap joints in pipe, 7/16-in. thick steel cyls.
(8) 25 constr. butt-strap joints ½-in. thick steel cyls.
(9) 12 circum. cuts in pipe.
(10) 400 cu. yd. reinf. conc. in struct.
(11) 100 cu. yd. plain conc.
(12) 1,580 bbls. P.C.C., furn.
(13) 32,000 lbs. furn. and pl. reinf. bars.
(14) 31 ea. constr. hous. structs. for pipe manholes.
(15) 17 ea. hous. struct. for pipe manhole and vacuum relief valve.
(16) 2 ea. hous. struct. for pipe manhole and 12-in. top blowoff.
(17) 375 lin. ft. furn. and drive timber piling.
(18) 50 furn. and install std. manholes on pipe.
(19) 15 furn. and install 6-in. air and vacuum relief valves, 225-lb. WP.
(20) 2 furn. and install 8-in. air and vacuum relief valves, 225-lb. WP.
(21) 6 furn. and install 1-in. automatic air release valves.
(22) 2 furn and install 12-in. top blowoffs.
(23) 100 lin. ft. furn. and install 12-in. bell and spigot CI pipe.
(24) 100 lin. ft. furn. and install 24-in. reinf. conc. culvert pipe.
(25) 60 sq. yd. furn. and pl. PCC pavement at road crossings.
(26) 540 sq. yd. furn. and pl. bitum. pave.
(27) 1,650 cu. yd. furn. sand for backfill.
(28) 2,600 cu. yd. furn. imp. backfill for pipe fdn.
(29) 2,600 cu. yd. compact. backfill below pipe gd.
(30) 22,500 cu. yd. furn. sand for backfill in saturated ground.
(31) install spec. valves and fittings near Sta. 1929.
(32) sealing crossovers.

SCHEDULE V

Constructing Lined and Coated Steel Aqueduct—Unit E

(1) 180,000 cu. yd. excav. for trench.
(2) 700 cu. yd. excav. for struct.
(3) 102,700 cu. yd. backfill.
(4) 77,350 lin. ft. install 67-in. ID pipe sects.
(5) 2,100 construct. bell and spigot joints ⅜-in. thick steel cyls.
(6) 350 constr. bell and spigot jts. 7/16-in. thick steel cyls.
(7) 230 constr. butt-strap jts. ⅜-in. thick steel cyls.
(8) 20 constr. butt-strap jts. 7/16-in. thick steel cyls.
(9) 115 circum. cuts in pipe.
(10) 440 cu. yd. reinf. conc. in struct.
(11) 100 plain conc. in struct.
(12) 1,520 bbl. furn. PCC.
(13) 35,000 lb. furn. and pl. reinf. bars.
(14) 1 constr. hous. struct. for pipe manhole.
(15) 26 constr. hous. struct. for pipe manhole and vacuum relief valve.
(16) 24 constr. do for pipe manhole and 8-in. top blowoff.
(17) 78 furn. and install std. manholes on pipe.
(18) 9 furn. and install 6-in. air and vacuum relief valves, 125-lb. WP.
(19) 14 furn. and install 6-in. air and vacuum relief valves, 175-lb. WP.
(20) 75 furn. and install 8-in. air and vacuum relief valves, 125-lb. WP.
(21) 19 furn. and install 8-in. air and vacuum relief valves, 17-lb. WP.
(22) 38 furn. and install 1-in. automatic air release valves.
(23) 9 furn. and install 8-in. top blowoffs, 125-lb. WP.
(24) 5 furn. and install 8-in. top blowoffs, 175-lb. WP.
(25) 720 lin. ft. furn. and install 8-in. bell and spigot CI pipe.
(26) 60 lin. ft. furn and install 12-in. bell and spigot CI pipe.
(27) 7 furn. and install manhole frame and cover assem.—Unit 2—on conc. struct.
(28) 20 furn. and install manhole frame and cover assemb.—Unit 3—on conc. struct.
(29) 35 furn. and install 24-in. reinf. conc. culvert pipe.
(30) 725 sq. yd. furn. and pl. bitum. pave. at road crossings.
(31) 625 cu. yd. furn. sand backfill.
(32) 1,600 cu. yd. furn. imp. backfill for pipe fdn.
(33) 4,700 cu. yd. compact backfill below pipe gd.
(34) install special valves and fittings near Sta. 189 and near Sta. 527 plus 75.

(Continued on next page)

FAST-WORKING LORAIN TL-20 MOTO-CRANE OF COMMERCIAL DISTRIBUTING CO. SPEEDS UP TACOMA PIPE-LAYING JOB

Thew Lorain TL 20

Tacoma pipe-laying is a snap for this new Lorain Moto-Crane of the Commercial Distributing Co., Tacoma, Washington. This fast-moving Lorain TL-20 unloads 9000 lbs. of 58-inch diameter pipe on a seven mile water line for the city of Tacoma, Wash.

And when you install a Lorain TL-20 for crane lifting service, the standard unit comes to you as a "complete package" including all equipment and accessories essential to heavy-duty, accurate, safe, steel-erector's lifting service. You get—(1) 2-piece, all-welded boom; (2) All-purpose boom head; (3) Steel erector's precision boom hoist; (4) Boom stops; (5) Swing brake; (6) Power load lowering. Ask your Thew-Lorain Dealer about the TL-20 "complete package" feature and What it means in profits on your jobs!

THE THEW SHOVEL CO., LORAIN, OHIO

Lifting 9000 lb. Tacoma water main sections is no problem for this fast-moving, big-producing Lorain TL-20 Moto-Crane. Speeds of 30 m.p.h. on big rubber tires keep this TL-20 in the profit column wherever it works.

See Your THEW Lorain REG. U. S. TRADE MARK Dealer

BUNTING TRACTOR CO., Inc. *Boise, Twin Falls, Gooding, Fairfield, Burley, Carey, Idaho La Grande, Oregon*

CATE EQUIPMENT CO. *Salt Lake City 4*

CENTRAL MACHINERY CO. *Great Falls and Havre, Mont.*

COAST EQUIPMENT CO. *San Francisco 3*

A. H. COX & COMPANY *Seattle 4, Wash.*

P. L. CROOKS & CO., INC. *Portland 10, Ore.*

LE ROI-RIX MACHINERY CO. *Los Angeles 11*

LIBERTY TRUCKS & PARTS CO. *Denver 1*

MOUNTAIN TRACTOR CO. *Missoula and Kalispell, Mont.*

LEE REDMAN EQUIPMENT CO. *Phoenix, Arizona*

SANFORD TRACTOR & EQUIPMENT CO. *Reno, Nev.*

TRACTOR & EQUIPMENT CO. *Sidney, Mont.*
Branch: Miles City Equip. Co., Miles City, Mont.

WORTHAM MACHINERY CO. *Cheyenne, Wyo., Billings, Mont. Branches: Sheridan, Greybull, Casper and Rock Springs, Wyo.*

SCHEDULE VI

Furnishing and Installing Reinforced Concrete Aqueduct—Unit D

(1) 6,910 lin. ft. furn. Class 67-440 reinf. conc. pipe.
(2) 10,090 lin. ft. furn. Class 67-460 reinf. conc. pipe.
(3) 28,000 lin. ft. furn. Class 67-480 reinf. conc. pipe.
(4) 30,010 lin. ft. furn. Class 67-500 reinf. conc. pipe.
(5) 40,730 lin. ft. furn. Class 67-520 reinf. conc. pipe.
(6) 60 lin. ft. furn 67-in. ID lined and coated steel pipe with ½-in. steel plate cyl.
(7) 115,800 lin. ft. deliv. pipe at site.
(8) 371,500 cu. yd. excav. for trench.
(9) 350 cu. yd. excav. for structs.
(10) 220,800 cu. yd. backfill.
(11) 115,740 lin. ft. install 67-in. ID reinf. conc. pipe.
(12) 60 lin. ft. install 67-in. ID lined and coated steel pipe.
(13) 100 lin. ft. furn. and install 12-in. bell and spigot CI pipe.
(13) 1 ea. constr. bell and spigot joints in steel pipe.
(14) 7 ea. constr. butt-strap joints in steel pipe.
(15) 510 cu. yd. reinf. conc. in struct.
(16) 100 cu. yd. plain conc. in struct.
(17) 2,000 bbls. furnished PC.
(18) 41,000 lbs. furn. and pl. reinf. bars.
(19) 31 ea. constr. hous. struct. for pipe manhole.
(20) 17 ea. constr. hous. struct. for pipe manhole and vacuum relief valve.
(21) 2 ea. constr. hous. struct. for pipe manhole and 12-in. top blowoff.
(22) 375 lin. ft. furn. and drive timber piling.
(23) 50 furn. and install std. manholes on pipe.
(24) 15 furn. and install 6-in. air and vacuum relief valves—225-lb. WP.
(25) 2 furn. and install 8-in. air and vacuum relief valves—225-lb. WP.
(26) 6 furn. and install 1-in. automatic air release valves.
(27) 3 furn. and install 12-in. top blowoffs—225-lb. WP.
(28) 100 lin. ft. furn. and install 12-in. bell and spigot CI pipe.
(29) 100 lin. ft. furn. and install 24-in. reinf. conc. culvert pipe.
(30) 65 sq. yd. furn. and pl. PCC pavement at road crossings.
(31) 590 sq. yd. furn. and pl. bitum. pave.
(32) 1,750 cu. yd. furn. sand for backfill at road crossings.
(33) 2,300 cu. yd. furn. imp. backfill for pipe fdn.
(34) 2,300 cu. yd. compact backfill below pipe gr.
(35) 1,000 cu. yd. furn. sand for backfill in saturated ground.
(36) install spec. valves and fittings near Sta. 1929.
(37) seal crossovers.

SCHEDULE VII

Furnishing and Installing Reinforced Concrete Aqueduct—Unit E

(1) 980 lin. ft. furn. Class 67-180 reinf. conc. pipe.
(2) 2,480 lin. ft. furn. Cl. 67-200 reinf. conc. pipe.
(3) 2,680 lin. ft. furn. Cl. 67-220 reinf. conc. pipe.
(4) 4,780 lin. ft. furn. Cl. 67-240 reinf. conc. pipe.
(5) 5,760 lin. ft. furn. Cl. 67-260 reinf. conc. pipe.
(6) 9,640 lin. ft. furn. Cl. 67-280 reinf. conc. pipe.
(7) 9,280 lin. ft. furn Cl. 67-300 reinf. conc. pipe.
(8) 11,470 lin. ft. furn. Cl. 67-320 reinf. conc. pipe.
(9) 7,480 lin. ft. furn. Cl. 67-340 reinf. conc. pipe.
(10) 8,700 lin. ft. furn Cl. 67-360 reinf. conc. pipe.
(11) 3,120 lin. ft. furn. Cl. 67-380 reinf. conc. pipe.
(12) 4,420 lin. ft. furn Cl. 67-400 reinf. conc. pipe.
(13) 5,740 lin. ft. furn Cl. 67-420 reinf. conc. pipe.
(14) 700 lin. ft. furn. Cl. 67-440 reinf. conc. pipe.
(15) 120 lin. ft. furn. 67-in. ID lined and coated steel pipe with ⅜-in. steel plate cyl.
(16) fab. pipe bend for Pardee tunnel outlet.
(17) 77,350 lin. ft. deliv. pipe at site.
(18) 210,000 cu. yd. excav. for trench.
(19) 250 cu. yd. excav. for structs.
(20) 109,500 cu. yd. backfill.
(21) 77,230 lin. ft. install 67-in. ID reinf. conc. pipe.
(22) 120 lin. ft. install 67-in. ID lined and coated steel pipe.
(23) 3 constr. bell and spigot joints in steel pipe.
(24) 6 constr. butt-strap joints in steel pipe.
(25) 225 cu. yd. reinf. conc. in struct.
(26) 100 cu. yd. plain conc. in struct.
(27) 1,525 bbls. furn. PC.
(28) 16,000 lbs. furn. and pl. reinf. bars.
(29) 1 constr. hous. struct. for pipe manhole.
(30) 50 constr. hous. struct. for pipe manhole and vacuum relief valve.
(31) 24 constr. hous. struct. for pipe manhole and 8-in. top blowoff.
(32) 75 furn. and install std. manholes on pipe.
(33) 31 furn. and install 6-in. air and vacuum relief valves, 125-lb. WP.
(34) 19 furn. and install 6-in. air and vacuum relief valves, 175-lb. WP.
(35) 38 furn. and install 1-in. automatic air release valves.
(36) 9 furn. and install 8-in. top blow-offs, 125-lb. WP.
(37) 15 furn. and install 8-in. top blow-offs, 175-lb. WP.
(38) 720 lin. ft. furn and install 8-in. bell and spigot CI pipe.
(39) 60 lin. ft. furn. and install 12-in. bell and spigot CI pipe.
(40) 35 lin. ft. furn. and install 24-in. reinf. conc. culvert pipe.
(41) 740 sq. yd. furn. and pl. bitum. pave. at road crossings.
(42) 675 cu. yd. furn. sand for backfill.
(43) 3,000 cu. yd. furn. imp. backfill for pipe fdn.
(44) 11,700 cu. yd. compact backfill below pipe gr.
(45) install spec. valves and fittings near Station 189 and near Sta. 527 plus 75.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
SCHED. I									
(1)	26.40								30.50
(2)	3.50								3.65
(3)	3.00								3.20
(4)	4.25								4.45
(5)	.12								.13
(6)	2.00								2.10
SCHED. II									
(1)	23.70								
(2)	26.40								
(3)	3.50								
(4)	3.00								
(5)	4.25								
(6)	1.90								
SCHED. III									
(1)	20.60								
(2)	23.70								
(3)	3.50								
(4)	3.00								
(5)	4.25								
(6)	$3,935								
(7)	3.00								
SCHED. IV									
(1)		.90	1.40		.97	1.84	1.70	2.00	
(2)		3.00	12.00		3.00	7.00	5.00	15.00	
(3)		.40	.40		.40	.37	.65	.75	
(4)		1.90	2.80		1.50	1.43	1.12	1.30	
(5)		75.00	75.00		85.00	106.00	100.00	110.00	
(6)		80.00	75.00		90.00	106.00	100.00	120.00	
(7)		250.00	150.00		170.00	200.00	350.00	500.00	
(8)		300.00	150.00		180.00	200.00	350.00	550.00	
(9)		40.00	50.00		50.00	55.00	65.00	100.00	
(10)		75.00	70.00		60.00	60.00	85.00	80.00	
(11)		50.00	50.00		50.00	60.00	85.00	60.00	
(12)		3.00	4.00		4.00	4.00	5.00	4.25	
(13)		.15	.15		.12	.10	.15	.14	
(14)		450.00	400.00		325.00	275.00	400.00	340.00	
(15)		500.00	400.00		350.00	450.00	650.00	390.00	
(16)		532.00	450.00		350.00	450.00	600.00	400.00	
(17)		5.00	5.00		10.00	2.50	9.00	4.00	
(18)		250.00	400.00		250.00	275.00	300.00	250.00	
(19)		350.00	600.00		575.00	450.00	600.00	520.00	
(20)		550.00	800.00		800.00	700.00	900.00	$1,000	

(Continued on next page)

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(21)	.....	.....	40.00	70.00	.....	50.00	75.00	60.00	70.00	.....
(22)	.....	.....	650.00	900.00	.....	$1,250	$1,000	$1,000	$1,000	.....
(23)	.....	.....	8.00	8.00	.....	5.00	8.00	10.00	8.00	.....
(24)	.....	.....	10.00	12.00	.....	10.00	8.00	9.00	10.00	.....
(25)	.....	.....	12.00	10.00	.....	9.00	5.00	20.00	30.00	.....
(26)	.....	.....	5.00	10.00	.....	5.00	2.75	6.00	8.00	.....
(27)	.....	.....	6.00	3.50	.....	3.50	4.00	2.00	6.50	.....
(28)	.....	.....	2.50	2.50	.....	2.75	4.00	2.00	7.50	.....
(29)	.....	.....	2.00	2.50	.....	3.00	4.00	2.00	4.00	.....
(30)	.....	.....	2.50	2.00	.....	2.75	2.00	2.10	3.75	.....
(31)	.....	.....	$1,000	$1,500	.....	$1,000	$3,000	$1,200	500.00	.....
(32)	.....	.....	$1,000	$1,200	.....	$1,500	$3,000	$1,100	$3,000	.....
SCHED. V										
(1)	.....	.....	.....	2.00	.....	3.60	2.30	2.62	4.00	.....
(2)	.....	.....	.....	12.00	.....	6.00	8.00	5.50	10.00	.....
(3)	.....	.....	.....	.40	.....	.50	.45	.94	.75	.....
(4)	.....	.....	.....	2.70	.....	2.00	2.13	1.33	1.10	.....
(5)	.....	.....	.....	70.00	.....	80.00	106.00	117.00	100.00	.....
(6)	.....	.....	.....	75.00	.....	85.00	106.00	117.00	110.00	.....
(7)	.....	.....	.....	130.00	.....	160.00	200.00	340.00	300.00	.....
(8)	.....	.....	.....	150.00	.....	170.00	200.00	342.00	320.00	.....
(9)	.....	.....	.....	40.00	.....	50.00	55.00	62.00	100.00	.....
(10)	.....	.....	.....	75.00	.....	60.00	60.00	90.00	80.00	.....
(11)	.....	.....	.....	50.00	.....	50.00	60.00	90.00	60.00	.....
(12)	.....	.....	.....	4.00	.....	4.00	4.00	4.40	4.25	.....
(13)	.....	.....	.....	.15	.....	.12	.10	.13	.14	.....
(14)	.....	.....	.....	400.00	.....	325.00	400.00	430.00	340.00	.....
(15)	.....	.....	.....	400.00	.....	350.00	475.00	640.00	390.00	.....
(16)	.....	.....	.....	400.00	.....	350.00	450.00	620.00	350.00	.....
(17)	.....	.....	.....	400.00	.....	250.00	275.00	280.00	250.00	.....
(18)	.....	.....	.....	500.00	.....	500.00	400.00	470.00	500.00	.....
(19)	.....	.....	.....	500.00	.....	500.00	400.00	485.00	500.00	.....
(20)	.....	.....	.....	650.00	.....	675.00	640.00	730.00	750.00	.....
(21)	.....	.....	.....	650.00	.....	675.00	640.00	740.00	750.00	.....
(22)	.....	.....	.....	70.00	.....	50.00	70.00	57.00	70.00	.....
(23)	.....	.....	.....	400.00	.....	450.00	380.00	450.00	500.00	.....
(24)	.....	.....	.....	500.00	.....	450.00	380.00	510.00	500.00	.....
(25)	.....	.....	.....	6.00	.....	4.00	6.00	8.30	6.00	.....
(26)	.....	.....	.....	8.00	.....	5.00	8.00	11.00	8.00	.....
(27)	.....	.....	.....	200.00	.....	135.00	135.00	180.00	150.00	.....
(28)	.....	.....	.....	350.00	.....	160.00	160.00	213.00	175.00	.....
(29)	.....	.....	.....	12.00	.....	10.00	8.00	11.00	10.00	.....
(30)	.....	.....	.....	10.00	.....	5.00	2.75	1.00	8.00	.....
(31)	.....	.....	.....	3.60	.....	4.00	5.50	1.00	6.00	.....
(32)	.....	.....	.....	2.50	.....	4.00	4.00	1.00	3.50	.....
(33)	.....	.....	.....	2.50	.....	3.50	4.00	1.00	4.00	.....
(34)	.....	.....	.....	$3,000	.....	$2,000	$4,000	$3,500	$2,500	.....
SCHED. VI										
(1)	.....	.....	.....	39.00	38.55	.....	.....	.....	.....	.....
(2)	.....	.....	.....	39.80	39.45	.....	.....	.....	.....	.....
(3)	.....	.....	.....	40.50	40.40	.....	.....	.....	.....	.....
(4)	.....	.....	.....	42.00	41.30	.....	.....	.....	.....	.....
(5)	.....	.....	.....	43.00	42.25	.....	.....	.....	.....	.....
(6)	.....	.....	.....	60.00	60.00	.....	.....	.....	.....	.....
(7)	.....	.....	.....	2.00	1.00	.....	.....	.....	.....	.....
(8)	.....	.....	.....	1.30	1.10	.....	.....	.....	.....	.....
(9)	.....	.....	.....	12.00	4.50	.....	.....	.....	.....	.....
(10)	.....	.....	.....	.40	1.00	.....	.....	.....	.....	.....
(11)	.....	.....	.....	2.50	2.90	.....	.....	.....	.....	.....
(12)	.....	.....	.....	10.00	6.00	.....	.....	.....	.....	.....
(13)	.....	.....	.....	200.00	225.00	.....	.....	.....	.....	.....
(14)	.....	.....	.....	250.00	325.00	.....	.....	.....	.....	.....
(15)	.....	.....	.....	70.00	60.00	.....	.....	.....	.....	.....
(16)	.....	.....	.....	50.00	35.00	.....	.....	.....	.....	.....
(17)	.....	.....	.....	4.00	4.25	.....	.....	.....	.....	.....
(18)	.....	.....	.....	.15	.12	.....	.....	.....	.....	.....
(19)	.....	.....	.....	400.00	275.00	.....	.....	.....	.....	.....
(20)	.....	.....	.....	400.00	350.00	.....	.....	.....	.....	.....
(21)	.....	.....	.....	450.00	340.00	.....	.....	.....	.....	.....
(22)	.....	.....	.....	5.00	6.75	.....	.....	.....	.....	.....
(23)	.....	.....	.....	400.00	275.00	.....	.....	.....	.....	.....
(24)	.....	.....	.....	600.00	500.00	.....	.....	.....	.....	.....
(25)	.....	.....	.....	800.00	775.00	.....	.....	.....	.....	.....
(26)	.....	.....	.....	70.00	75.00	.....	.....	.....	.....	.....
(27)	.....	.....	.....	900.00	850.00	.....	.....	.....	.....	.....
(28)	.....	.....	.....	12.00	7.00	.....	.....	.....	.....	.....
(29)	.....	.....	.....	8.00	14.00	.....	.....	.....	.....	.....
(30)	.....	.....	.....	10.00	12.00	.....	.....	.....	.....	.....
(31)	.....	.....	.....	10.00	4.80	.....	.....	.....	.....	.....
(32)	.....	.....	.....	3.40	4.00	.....	.....	.....	.....	.....
(33)	.....	.....	.....	2.50	2.50	.....	.....	.....	.....	.....
(34)	.....	.....	.....	2.50	2.00	.....	.....	.....	.....	.....
(35)	.....	.....	.....	2.00	3.00	.....	.....	.....	.....	.....
(36)	.....	.....	.....	$1,500	950.00	.....	.....	.....	.....	.....
(37)	.....	.....	.....	$1,200	$3,650	.....	.....	.....	.....	.....
SCHED. VII										
(1)	.....	.....	.....	27.30	30.05	.....	.....	.....	.....	.....
(2)	.....	.....	.....	27.80	30.40	.....	.....	.....	.....	.....
(3)	.....	.....	.....	28.30	30.80	.....	.....	.....	.....	.....
(4)	.....	.....	.....	28.80	31.20	.....	.....	.....	.....	.....
(5)	.....	.....	.....	29.30	31.55	.....	.....	.....	.....	.....
(6)	.....	.....	.....	29.80	32.00	.....	.....	.....	.....	.....
(7)	.....	.....	.....	30.30	32.50	.....	.....	.....	.....	.....
(8)	.....	.....	.....	30.80	33.05	.....	.....	.....	.....	.....
(9)	.....	.....	.....	31.30	33.50	.....	.....	.....	.....	.....
(10)	.....	.....	.....	31.70	34.40	.....	.....	.....	.....	.....
(11)	.....	.....	.....	32.40	35.35	.....	.....	.....	.....	.....
(12)	.....	.....	.....	32.80	36.30	.....	.....	.....	.....	.....
(13)	.....	.....	.....	33.50	37.25	.....	.....	.....	.....	.....
(14)	.....	.....	.....	34.00	38.30	.....	.....	.....	.....	.....
(15)	.....	.....	.....	50.00	50.00	.....	.....	.....	.....	.....
(16)	.....	.....	.....	$4,000	$2,150	.....	.....	.....	.....	.....
(17)	.....	.....	.....	1.80	.90	.....	.....	.....	.....	.....
(18)	.....	.....	.....	2.00	1.45	.....	.....	.....	.....	.....
(19)	.....	.....	.....	12.00	5.50	.....	.....	.....	.....	.....
(20)	.....	.....	.....	.40	1.00	.....	.....	.....	.....	.....
(21)	.....	.....	.....	2.50	2.90	.....	.....	.....	.....	.....
(22)	.....	.....	.....	10.00	5.00	.....	.....	.....	.....	.....
(23)	.....	.....	.....	200.00	175.00	.....	.....	.....	.....	.....
(24)	.....	.....	.....	250.00	300.00	.....	.....	.....	.....	.....

(Continued on next page)

Welded Design Eliminates Dead Weight in 4-Story Structure

By Roy L. Brown, Partner
Brown's Machine Shop, Sedalia, Mo.

THE all-welded design of our new four-story building now under construction has eliminated structural dead weight and thus increased each floor's capacity to carry heavy machinery loads. The reduction in steel and speedier erection with arc welding have also cut construction costs.

We designed the 92 x 120′ building for our own use as an automotive machine shop. All welding was done with "Fleetweld 47" electrode.

Double pipe columns reinforced with concrete are used throughout and are reported to be superior to conventional upright floor supports. Rising from the reinforced concrete basement floor to support the first floor are columns made of 10″ steel pipe with 6″ pipe inside, both filled with concrete and welded to a 2″ bearing plate.

ALL-STEEL FLOOR

Fig. 1 shows a similar 10″ double pipe columnar support for the second floor being welded to the top flange of a 24″ I beam at the first floor level. This column contains a 4″ pipe. The columns for upper stories are 7″ pipe with 4″ pipe inserted. In Fig. 1 bar joists have been welded to the I beams. Steel deck flooring was later welded to the bar joists. During construction this floor supported a truck and hoist to raise a 40-ft. beam weighing 4 tons.

Fig. 2. Two welders weld heavy beams simultaneously to avoid distortion.

Fig. 2 shows a vertical weld being made to join a curved lintel section to a straight lintel. Two welders are simultaneously welding on each side of the joint to maintain proper alignment. This procedure was used for welding all large beams. The curved lintel was shop-fabricated and hoisted into position for welding to straight lintels 80′ and 35′ long.

Fig. 3 shows the framework for the elevator penthouse and loading dock. Here 12″ door channels were formed from ¼″ steel plate and welded to a 13″ Z-bar, and 6″ x 6″ x ⅜″ angles were welded to the Z-bar to complete the lintel over the loading dock door.

Fig. 1. Welding pipe column to first floor I beam. Column has a smaller pipe and concrete inside.

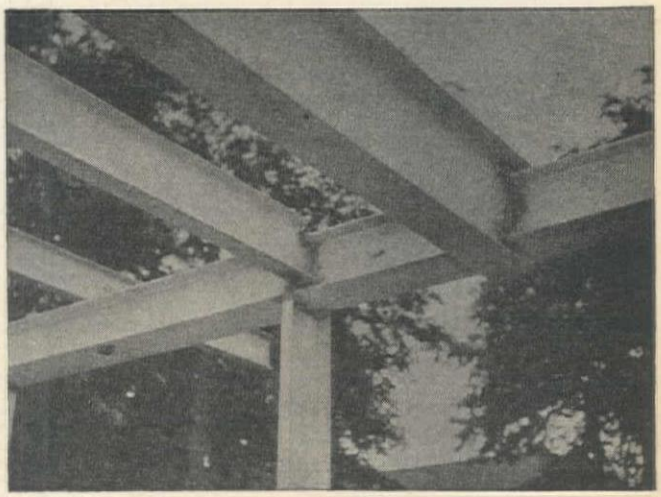


Fig. 3. Framework for loading dock contains channels, I beams, angles and Z-bar.

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	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(25)	.....	.....	.....	50.00	60.00	.....	.....	.....	.....	.....
(26)	.....	.....	.....	50.00	35.00	.....	.....	.....	.....	.....
(27)	.....	.....	.....	4.00	4.25	.....	.....	.....	.....	.....
(28)	.....	.....	.....	.15	.12	.....	.....	.....	.....	.....
(29)	.....	.....	.....	400.00	275.00	.....	.....	.....	.....	.....
(30)	.....	.....	.....	400.00	350.00	.....	.....	.....	.....	.....
(31)	.....	.....	.....	400.00	340.00	.....	.....	.....	.....	.....
(32)	.....	.....	.....	400.00	275.00	.....	.....	.....	.....	.....
(33)	.....	.....	.....	500.00	450.00	.....	.....	.....	.....	.....
(34)	.....	.....	.....	500.00	500.00	.....	.....	.....	.....	.....
(35)	.....	.....	.....	70.00	75.00	.....	.....	.....	.....	.....
(36)	.....	.....	.....	400.00	400.00	.....	.....	.....	.....	.....
(37)	.....	.....	.....	500.00	475.00	.....	.....	.....	.....	.....
(38)	.....	.....	.....	6.00	5.00	.....	.....	.....	.....	.....
(39)	.....	.....	.....	8.00	7.00	.....	.....	.....	.....	.....
(40)	.....	.....	.....	12.00	12.00	.....	.....	.....	.....	.....
(41)	.....	.....	.....	10.00	4.80	.....	.....	.....	.....	.....
(42)	.....	.....	.....	3.60	4.00	.....	.....	.....	.....	.....
(43)	.....	.....	.....	2.50	2.00	.....	.....	.....	.....	.....
(44)	.....	.....	.....	2.00	2.00	.....	.....	.....	.....	.....
(45)	.....	.....	.....	$3,000	$1,900	.....	.....	.....	.....	.....

Bridge and Grade Separation . . .

Arizona—Greenlee County—State—Bridge

Vinson Construction Co., Phoenix, submitted the low bid of $354,980 before the State Highway Commission at Phoenix for work consisting of removal of the existing bridge and construction of a new steel bridge and approaches for the Gila River crossing at Duncan. The following unit bids were submitted:

(1) Vinson Construction Co. $354,980
(2) H. L. Roydon 358,596
(3) Vinnell Co., Inc. $369,297
(4) Bowen & McLaughlin 378,545

	(1)	(2)	(3)	(4)
300 cu. yd. roadway excav.	2.00	.90	.90	1.25
80 cu. yd. drainage excav.	2.00	.90	1.25	2.00
1,800 cu. yd. structural excav.	5.00	18.50	8.50	7.00
7,400 ton imported borrow	1.10	.75	.75	1.20
500 ton select material	2.50	1.25	3.65	2.00
200 M. gal. sprinkling	2.50	2.75	2.40	3.00
60 hr. rolling	6.00	6.50	10.00	6.00
30 hr. mechanical tamping	4.00	5.00	8.50	7.00
707 cu. yd. Class "A" concrete	68.00	52.00	63.00	77.50
1,180 cu. yd. Class "D" concrete	67.50	54.00	63.00	71.40
135 cu. yd. Tremie concrete Class "A"	25.00	21.00	63.00	33.00
326,400 lb. reinforcing steel bars	.11	.11	.10	.12
472,200 lb. structural steel	.155	.16	.15	.145
2,441 lin. ft. structural steel handrail	7.00	6.50	5.00	10.00
14,160 lin. ft. steel H-column piles 10-in. x 10-in. at 42 lb.	3.00	2.80	2.60	3.05
234 ea. driving piles steel H-col. 10-in. x 10-in. at 42 lb.	48.00	80.00	100.00	60.00
150 lin. ft. steel H-column test piles	4.00	6.00	3.40	4.00
2 ea. driving steel H-column test piles	185.00	250.00	$2,000	300.00
1,775 lin. ft. steel sheet piling 33 lb.	3.00	2.90	2.60	3.25
59 ea. driving steel sheet piles	50.00	40.00	80.00	65.00
54 lin. ft. 24-in. corr. metal pipe	5.50	5.00	3.65	5.50
76 lin. ft. 36-in. corr. metal pipe	9.00	8.50	6.00	7.50
250 ton mineral aggregate	2.50	2.25	3.65	4.00
20 ton cutback asphalt MC-3 or MC-2	40.00	50.00	50.00	45.00
0.142 mi. processing road mix	$2,500	$2,000	$2,500	$2,500
20 ton cover material	6.00	4.50	5.00	7.00
200 cu. yd. plain riprap	10.00	6.80	8.50	12.00
60 sq. yd. placing intersections	.75	1.00	1.25	2.00
Lump sum, removal of bridge and concrete box	$9,684	$15,500	$23,000	$5,000

Washington—Pierce County—State—Suspension Type Span

Bethlehem Pacific Coast Steel Corp., San Francisco, Calif., submitted the low bid of $8,263,903 for the construction of the Tacoma Narrows bridge structure to the Department of Highways at Olympia. John A. Roebling's Sons Co. of California, San Francisco, was low on Schedule II for the cable work with a bid of $2,932,681. The bridge is to be a 4-lane suspension type having a 2,800-ft. central span and two 1,110-ft. side spans, and is to be constructed over Puget Sound, Primary State Highway No. 14. The existing piers, anchorages and approaches are to be modified or reconstructed while the superstructure will be completely new. 830 days are allowed for completion. Unit bids are as follows:

	Schedule I	Schedule II	Total
(1) Bethlehem Pacific Coast Steel Corp.	$8,263,903	.....	$8,263,903
(2) John A. Roebling's Sons Co. of Calif.	.....	$2,932,681	2,932,681
(3) Columbia Steel Co.	8,937,357	4,661,503	13,598,860

SCHEDULE I—BRIDGE STRUCTURE

	(1)	(2)	(3)
730 cu. yd. removing conc. piers No. 4 and 5	57.04	.....	12.60
5,900 cu. yd. remov. conc. east appr. and anchorage	13.28	.....	10.15
5,600 cu. yd. remov. conc. west appr. and anchorage	16.34	.....	12.50
2,880 cu. yd. conc., piers No. 4 and 5, Class F in pl.	34.67	.....	43.85
1,600 cu. yd. conc., east appr., Class F in pl.	46.58	.....	58.00
825 cu. yd. conc., east appr., Class A, in pl.	81.48	.....	121.50
500 cu. yd. conc., west appr., Class F, in pl.	48.06	.....	47.65
22,000 cu. yd. conc., east and west anchorages, Class F, in pl.	25.79	.....	26.10
875 cu. yd. conc., east and west anchorages, Class A, in pl.	30.17	.....	37.00
800,000 lb. reinf. steel in pl.	.093	.....	.108
56,000 lb. struct. steel grillages, anchor steel and bolts, piers 4, 5, 6 in pl.	.3315	.....	.41
21,000 cu. yd. struct. excav. east and west anchorages and app.	1.55	.....	3.75
20,000 cu. yd. roadway excav.	.735	.....	.88
1,280 lin. ft. conc. handrail (not incl. reinf. steel) in pl.	12.53	.....	11.40
Lump sum, toll booths and admin. bldgs. incl. office furn., complete	$71,328	.....	$94,000
625 cu. yd. conc. pave. incl. reinf. steel and joint matl. in pl.	34.10	.....	26.20
3,500 lb. vents, pipe, grates and louvers, piers 4 and 5, and anchorages	1.24	.....	1.30
1,260 lb. bronze bearing plates	1.61	.....	.88
850 cu. yd. remov. conc. pave., sidewalks and railing	7.44	.....	7.85
300 cu. yd. sidewalks, gutters, curbs and retaining walls, class A	57.19	.....	105.00
Lump sum, drain. structs. E and W anchorages and app.	$26,814	.....	$19,600
215 lin. ft. std. beam guard rail, Type 1, design 6	3.71	.....	4.60
7,000 cu. yd. class C riprap	4.96	.....	5.90
10,500,000 lb. struct. steel, towers, complete	.183	.....	.19
166,000 lb. welded steel tower saddles	.3775	.....	.60
17,300,000 lb. struct. steel, suspended struct.	.18	.....	.195

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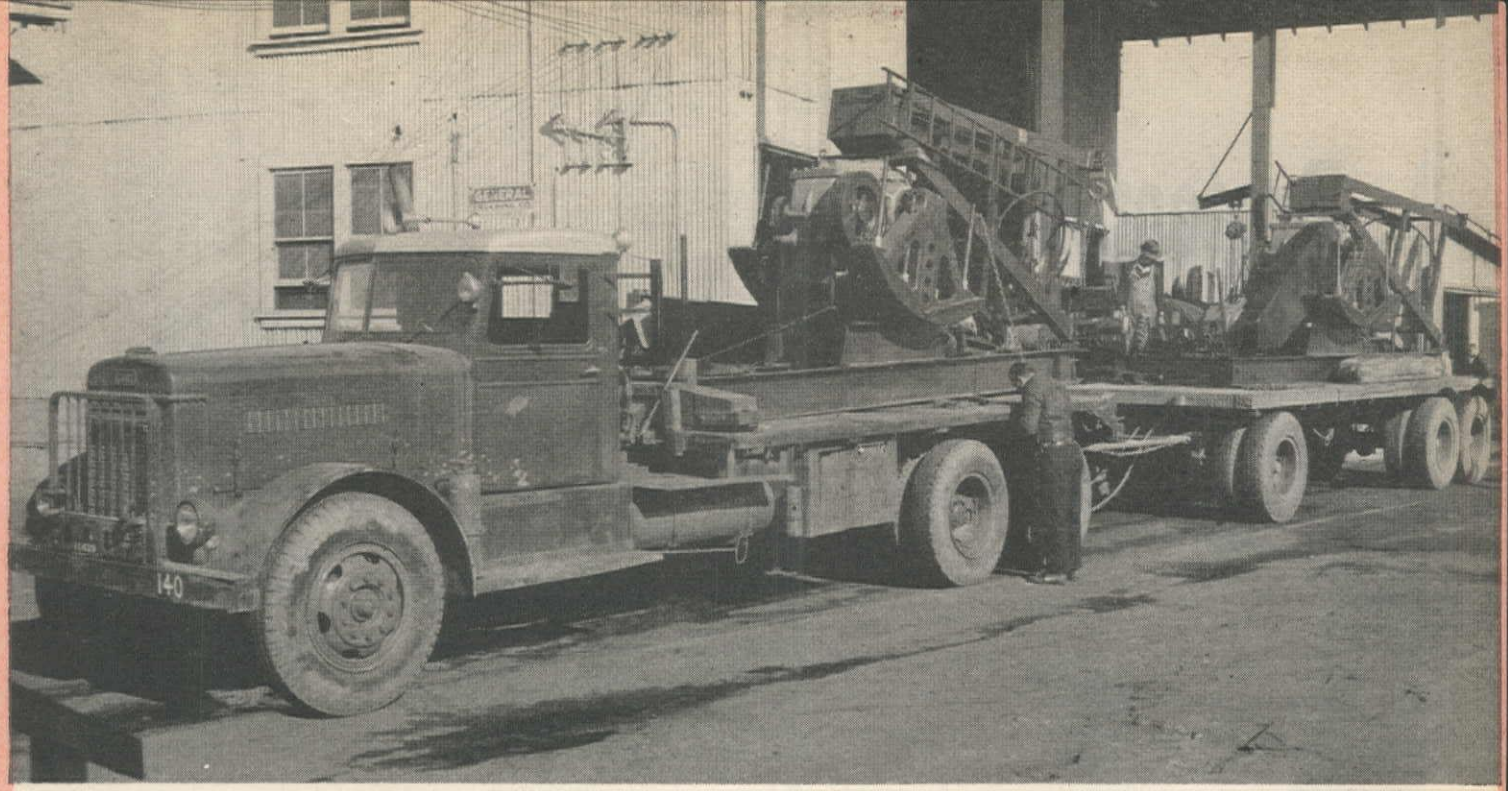

PETERBILTS POPULAR IN PETROLEUM INDUSTRY HAULING

Pictures here show the General Trucking Company PETERBILTS hauling oilfield machinery and well casing. They haul a varied cargo—anything that is necessary in the production of petroleum.

The General Trucking Company of Los Angeles specialize in hauling oil field machinery, equipment and supplies all over the state of California, with the major portion of their mileage piled up in Southern California.

Trucks engaged in this service must be able to leave the paved highways and take their loads anywhere that oil is being produced or wildcat drilling is to begin. They must traverse any kind of ground, sandy or muddy, deep-rutted dirt roads.

In this type of hauling, General Trucking Company operate their PETERBILTS about 3500 miles a month and conclude: "They are tops —they can't be beat."

Peterbilt Motors Company

107th AVENUE AND MacARTHUR BOULEVARD • OAKLAND, CALIFORNIA

85,000 lb. cast steel and forgings	.5615	.....	.54
57,000 lb. hydraulic jacks and fittings	4.00	.....	3.30
2,060,000 lbs. struct. steel roadway slots	.1755	.....	.20
4,350 cu. yd. conc. roadway, sta. 19 plus 50 to sta. 74 plus 00 in pl.	80.68	.....	112.90
Sack price to be added or deducted for cem. etc.	1.21	.....	.75
1,050,000 lb. reinf. steel, conc. roadway in pl.	.093	.....	.114
Lump sum, recond. west appr. (but not incl. rdwy. sidewk. slabs or handrls.)	$114,302	.....	$61,500
Lump sum, furn. and install maint. travelers (not incl. running rails & hgrs.)	$51,691	.....	$53,700
11,080 lin. ft. steel hand rail, compl.	24.50	.....	25.70
500 lb. bronze plates	1.55	.....	1.05
Lump sum, roadway drains, west appr., incl. connections to ground drain	$5,083	.....	$1,300
Lump sum, lighting and electrical equip. and wiring	$90,946	.....	$113,900
134 units metal lamp posts	562.65	.....	754.00
2 units tower elevators, complete in place	$25,769	.....	$31,200
Lump sum, toll collecting equip., compl. in place	$6,704	.....	$8,620

SCHEDULE II—CABLE WORK

10,600,000 lb. main wire cable (No. 6) in pl.	.....	.2088	.3588
282,000 lb. wrapping wire (No. 9) in pl.	.....	.4284	.4122
262,000 lb. cable bands and splay cast.	.....	.7594	.4837
27,000 lb. high tensile bolts, in pl.	.....	.1897	.5032
152,600 lin. ft. 1⅜ in. hanger rope	.....	.9976	1.79
580 lin. ft. 1⅝ in. hanger rope, in pl.	.....	2.42	3.34
345 lin. ft. 1¾ in. hanger rope	.....	2.406	3.60
475 lin. ft. 2⅛ in. hanger rope	.....	2.349	5.07
88,000 lb. hanger fittings in pl.	.....	.2668	.8273
20,800 lin. ft. hand rope in pl.	.....	.5537	1.09
16,000 lb. hand rope fittings in pl.	.....	.3254	.609
1,210,000 lb. struct. steel, east and west anchorages in pl.	.....	.1405	.1428
138,000 lb. cast steel and forgings	.....	.2081	.3255

California—Los Angeles County—State—Undercrossing and Retaining Walls

James I. Barnes Construction Co., Santa Monica, was low bidder at $357,466 before the Division of Highways, Sacramento, for the construction of a reinforced concrete undercrossing and retaining walls on Harbor Parkway at Temple Street in Los Angeles. Other unit bids were as follows:

(A) James I. Barnes Construction Co.	$357,466	(F) Peter Kiewit Sons Co.	$368,958
(B) Byerts & Dunn	359,009	(G) Guy F. Atkinson	373,186
(C) W. J. Disteli	460,640	(H) Winston Bros. Co.	387,468
(D) Haddock Co.	360,640	(I) Oberg Bros.	398,824
(E) Carlo Bongiovanni	368,265	(J) Spencer Webb Co.	414,648

(1) 350 cu. yd. removing concrete.
(2) Lump sum, clearing and grubbing.
(3) 15,000 cu. yd. roadway excav.
(4) 3,810 cu. yd. struct. excav.
(5) 2,650 cu. yd. struct. backfill.
(6) 110 ton asphalt concrete.
(7) 35 cu. yd. Class "B" P.C.C. (pvm't.)
(8) 4,040 cu. yd. Class "A" P.C.C. (struct.)
(9) 439 lin. ft. rubber waterstops.
(10) 4,490 lb. misc. iron and steel.
(11) 12,365 lin. ft. furn. steel piling.
(12) 454 ea. driving piles.
(13) 46 ea. steel pile splices.
(14) 150 cu. yd. P.C.C. (curbs, gutters and side walks).
(15) 113 lin. ft. 15-in. R.C.P. (std. str.)
(16) 535 lin. ft. 6-in. std. dr. tile.
(17) 100 lin. ft. 4-in. std. dr. tile.
(18) 65 cu. yd. filter material.
(19) 138 lin. ft. 6-in. cast iron soil pipe.
(20) 779,000 lb. furn. bar reinf. steel.
(21) 779,000 lb. placing bar reinf. steel.
(22) 926 lin. ft. steel railing.
(23) Lump sum, Engineer's office.
(24) Lump sum, electrical lighting equipt.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	4.00	3.50	7.00	6.00	6.50	6.75	3.00	8.00	10.00	8.00
(2)	$1,000	$1,000	550.00	$1,100	$1,000	$1,800	$2,000	500.00	$1,000	$1,500
(3)	.90	.75	.80	.47	.75	.70	.75	.80	.75	.75
(4)	2.50	1.00	1.75	3.00	2.75	.70	2.00	3.00	3.00	3.00
(5)	3.50	2.50	3.00	3.00	3.00	2.80	2.50	2.00	3.00	3.50
(6)	12.00	8.00	6.00	5.70	8.00	11.00	7.00	7.00	8.00	10.00
(7)	50.00	20.00	27.00	22.00	25.00	20.00	20.00	30.00	25.00	25.00
(8)	45.00	48.00	50.00	52.90	51.00	52.00	54.00	52.00	59.00	58.00
(9)	2.50	3.00	3.00	2.75	3.00	2.10	3.00	2.20	3.00	2.50
(10)	.35	.30	.30	.26	.30	.40	.30	.30	.40	.30
(11)	2.10	2.30	2.00	1.85	2.15	2.20	2.00	2.40	2.00	2.50
(12)	25.00	30.00	33.00	23.50	21.00	25.00	25.00	44.00	21.00	40.00
(13)	35.00	20.00	23.00	17.50	15.00	20.00	15.00	16.00	20.00	20.00
(14)	50.00	35.00	35.00	27.50	40.00	36.00	35.00	45.00	40.00	40.00
(15)	4.50	3.00	4.50	3.65	5.00	5.00	4.00	4.00	3.00	4.00
(16)	.80	.75	1.50	1.70	1.50	.80	1.00	1.00	1.50	1.20
(17)	.70	.70	1.50	1.70	1.00	.75	1.00	1.00	1.00	1.00
(18)	5.00	6.00	3.50	4.00	6.00	6.30	7.00	6.00	5.00	5.00
(19)	3.00	3.00	3.00	4.60	6.00	3.60	5.00	3.00	3.00	3.00
(20)	.06	.06	.055	.057	.07	.06	.06	.06	.06	.06
(21)	.03	.03	.025	.02	.013	.03	.02	.025	.02	.02
(22)	7.50	7.00	6.60	6.60	7.10	8.00	7.00	7.00	7.00	8.00
(23)	$2,000	$2,000	$1,200	$1,000	$1,600	$1,000	$1,793	$2,000	$1,500	$2,000
(24)	$8,000	$8,500	$7,000	$5,850	$6,528	$4,136	$7,500	$7,500	$7,000	$10,000

Irrigation . . .

Wyoming—Park County—Bur. of Recl.—Laterals and Drain

Knowlton & Jensen, Salt Lake City, Utah, were low with a bid of $354,978 on two schedules before the Bureau of Reclamation at Cody, for the construction and completion of the Ralston lateral, station 231 plus 25.02 to station 413 plus 69.25; laterals R-1, R-4N, R-6N, R-11N, R-15-2N, R-15-6, R-15-9, R-15-11, R-26, R-28, R-32, R-39, R-41, and sublaterals; and north alkali drain, Heart Mountain Division, Shoshone Project. The work is located in the vicinity of Ralston. The following unit bids were submitted:

	Schedule I	Schedule II	Total
(1) Knowlton & Jensen	$167,113	$187,865	$354,978
(2) Askevold Construction Co., Inc.	215,211	258,864	473,900
(3) Sharrock & Pursel	231,405	247,149	478,554

SCHEDULE I

	(1)	(2)	(3)
70,000 cu. yd. excavation for lateral	.44	.50	.55
65,000 sta. cu. yd. overhaul	.06	.08	.10
5,600 cu. yd. compacting embankment	.40	.75	.65
5,200 cu. yd. excav. for drainage channels and dikes	.60	.50	.55
10,500 cu. yd. excav. for structures	2.00	2.75	3.00
5,200 cu. yd. backfill	.25	.35	.50
2,400 cu. yd. compacting backfill	1.00	3.00	3.00
700 sq. yd. dry-rock paving	5.00	8.00	10.00
1,150 cu. yd. concrete in struct.	61.00	75.00	80.00

(Continued on next page)

That's the sure-fire formula for transforming earth and rock into real pay dirt.

And that's the way Mack super-duty trucks are built to operate. On the toughest off-highway dump work Macks have consistently demonstrated their ability to move bigger yardage per load and more loads per hour.

They've got power in abundance! Extra margins of strength and stamina! Assured traction through Mack's exclusive Power Divider for both four and six-wheel trucks. And throughout their design special stress has been placed on ease of control, maneuverability and clear vision — thus reducing shovel delays to a minimum.

Mack trucks for off-highway service range up to the largest capacities built — gasoline or diesel — four or six wheels. Each is individually engineered for its specific job and each takes to its job only after thorough study of the proposed operation.

Our engineers will gladly advise you on the most efficient use of trucks on your particular excavation job.

Write or call your nearest Mack branch or dealer.

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Sacramento • San Francisco • Seattle • Portland
Salt Lake City • Factory branches and dealers
in all principal cities for service and parts.

Trucks for every purpose.

6192

1,725	bbl. furn. and handling cement	4.10	6.00	6.00
81,000	lb. furn. and pl. reinf. bars	.13	.17	.18
240	lin. ft. furn. and driving treated-timber piles	4.00	7.00	8.00
7	M.B.M. furn. and erect timber in struct.	275.00	300.00	300.00
744	lin. ft. furn. and laying 18-in. diam. conc. pipe	4.00	4.50	4.25
120	lin. ft. furn. and laying 30-in. diam. conc. pipe	7.00	9.00	10.00
56	lin. ft. furn. and laying 18-in. diam. corr. pipe	3.50	4.50	4.00
284	lin. ft. furn. and laying 24-in. diam. corr. pipe	5.00	7.00	7.25
78	lin. ft. furn. and laying 30-in. diam. corr. pipe	6.50	8.25	10.00
30	lin. ft. furn. and laying 36-in. diam. corr. pipe	8.00	10.50	11.00
48	lin. ft. erecting No. 72 metal flume	4.00	10.00	10.00
8,600	lb. installing gates	.15	.20	.20
4,500	lb. installing miscl. metalwork	.15	.20	.20

SCHEDULE II

65,000	cu. yd. excav. for lateral	.37	.50	.45
27,000	sta. cu. yd. overhaul	.05	.08	.10
1,600	cu. yd. compacting embankment	.40	1.12	1.00
125,000	cu. yd. excav. for drain	.33	.40	.35
1,000	cu. yd. excav. for draining channels and dikes	.75	1.10	1.00
9,800	cu. yd. excav. for struct.	1.75	2.75	2.50
4,400	cu. yd. backfill	.35	.35	.50
2,200	cu. yd. compacting backfill	.75	3.00	3.00
1,200	sq. yd. dry-rock paving	4.00	10.00	10.00
930	cu. yd. concrete in struct.	58.00	75.00	75.00
1,395	bbl. furn. and handling cement	4.10	6.00	6.00
72,000	lb. furn. and place reinf. bars	.13	.17	.17
1,300	lin. ft. furn. and driving treated-timber piles	4.00	7.00	7.00
42	M.B.M. furn. and erect timber in struct.	275.00	300.00	300.00
400	lin. ft. furn. and laying 18-in. diam. conc. pipe	4.00	4.50	4.50
176	lin. ft. furn. and laying 24-in. diam. conc. pipe	6.00	7.25	7.00
108	lin. ft. furn. and laying 30-in. diam. conc. pipe	8.00	10.50	10.00
52	lin. ft. furn. and laying 36-in. diam. conc. pipe	11.00	12.00	11.00
420	lin. ft. furn. and laying 18-in. diam. corr. pipe	3.50	4.50	4.50
174	lin. ft. furn. and laying 24-in. diam. corr. pipe	5.00	7.50	7.25
46	lin. ft. furn. and laying 30-in. diam. corr. pipe	6.50	12.00	10.00
26	lin. ft. furn. and laying 36-in. diam. corr. pipe	8.00	14.00	11.00
32	lin. ft. furn. and laying 42-in. diam. corr. pipe	10.00	16.75	15.00
26	lin. ft. furn. and laying 48-in. diam. corr. pipe	12.00	21.00	18.00
36	lin. ft. erecting No. 72 metal flume	4.00	10.00	10.00
5,400	lb. installing gates	.15	.20	.20
2,600	lb. installing miscl. metalwork	.15	.20	.20

Dam . . .

Oregon—Benton County—Corps of Engineers—Cofferdam

Guy F. Atkinson Co., Portland, was awarded a $1,096,510 contract by the Corps of Engineers, Portland, for the construction of a cofferdam for McNary Dam on the north bank of the Columbia River approx. 3 miles upstream from Plymouth. Shore arms of rock are to be constructed and sealed with impervious clay and silt material, which is to be found in abundance near the site of the work. The rock is obtained from that now being excavated from the navigation lock under construction. Unit Bids are as follows:

	(Including Item 14)	(Including Item 14A)
(1) Guy F. Atkinson Co.	$1,096,510	$1,116,610
(2) Morrison-Knudsen Co.	1,381,080	1,437,780
(3) Gilpin Construction Co.	1,542,425	1,593,425
(4) Engineers' Estimate	1,029,621	1,045,821

		(1)	(2)	(3)	(4)
4,000	cu. yd. overburden excav.	1.25	.68	3.00	2.54
1,000	cu. yd. rock excav.	9.00	11.15	25.00	21.00
35,000	cu. yd. rehandling exist. rock fill	.40	.49	1.60	.73
12,000	cu. yd. backfill	1.25	.77	2.50	1.09
2,000	cu. yd. spalls	1.50	3.12	3.50	1.82
23,500	cu. yd. filler blankets	1.00	4.21	4.50	2.63
45,000	cu. yd. impervious blanket	1.60	1.46	2.70	1.29
600	M. gal. sprinkling	2.25	3.32	5.00	3.05
1,500	M. sq. ft. addl. rolling, two passes	.25	.67	2.00	.37
33,000	cu. yd. fill in cofferdam cells	1.50	1.63	2.25	1.46
20,000	cu. yd. dumped-stone revet.	1.10	2.06	2.25	1.34
7,600	cu. yd. dumped-and-arranged stone revet.	1.60	3.18	3.00	2.36
1,800	T. straight-web steel sheet piling	283.00	317.00	300.00	199.00
300	T. standard mill-fab. tee-sect. piling	300.00	400.00	360.00	266.00
300	T. (alt.) locally fab. tee-sect. piling	367.00	589.00	530.00	320.00
1,300	T. straight-web sheet piling in stock piles	108.00	142.00	150.00	118.00
230	T. standard mill-fabricated tee-sect. in stock piles	165.00	228.00	225.00	186.50
500	cu. yd. grout for revet.	38.00	30.00	50.00	34.00
300	cu. yd. sand and cement in burlap bags	64.00	96.00	75.00	91.00
100	cu. yd. tremie conc.	36.00	32.00	30.00	35.80
25	cu. yd. conc. for floodgate slabs	30.00	28.00	75.00	51.00
1	job floodgates on cell No. 22	$1,000	$1,780	$2,000	$1,100
1	job initial pumping facilities	$35,575	$57,170	$60,000	$45,175
25	M. g.p.m. addl. pumping facilities	90.00	90.00	880.00	300.00
1,500	acre ft. pumping	7.00	7.50	4.00	2.54

Highway and Street . . .

Wyoming—Washakie County—State—Surf.

Taggart Construction Co., Cody, was awarded the contract on a low bid of $268,816, by the Wyoming Highway Department for the grading, draining, and surfacing of 10.9 mi. of U. S. Highway No. 20 between Worland and Rairden. The work includes 5 bridges and 5 reinf. conc. culverts. Unit bids were as follows:

(1)	Taggart Construction Co.	$268,816	
(2)	Heald & Tebbs	271,844	
(3)	Leach Brothers	286,123	
(4)	Peter Kiewit Sons' Co.	$295,829	
(5)	H. W. Read	305,201	

		(1)	(2)	(3)	(4)	(5)
237,000	cu. yd. excavation	.23	.225	.30	.25	.32
27,000	cu. yd. sta. overhall	.015	.015	.015	.015	.015
15,500	cu. yd. mi. haul	.20	.15	.20	.20	.25
3,000	M. gal. watering (emb.)	2.80	2.25	2.00	2.50	2.25
800	hr. sheepsfoot roller operations	7.00	4.00	5.00	4.50	12.00
225	hr. pneumatic tired roller operation	5.40	6.00	6.00	5.50	5.50

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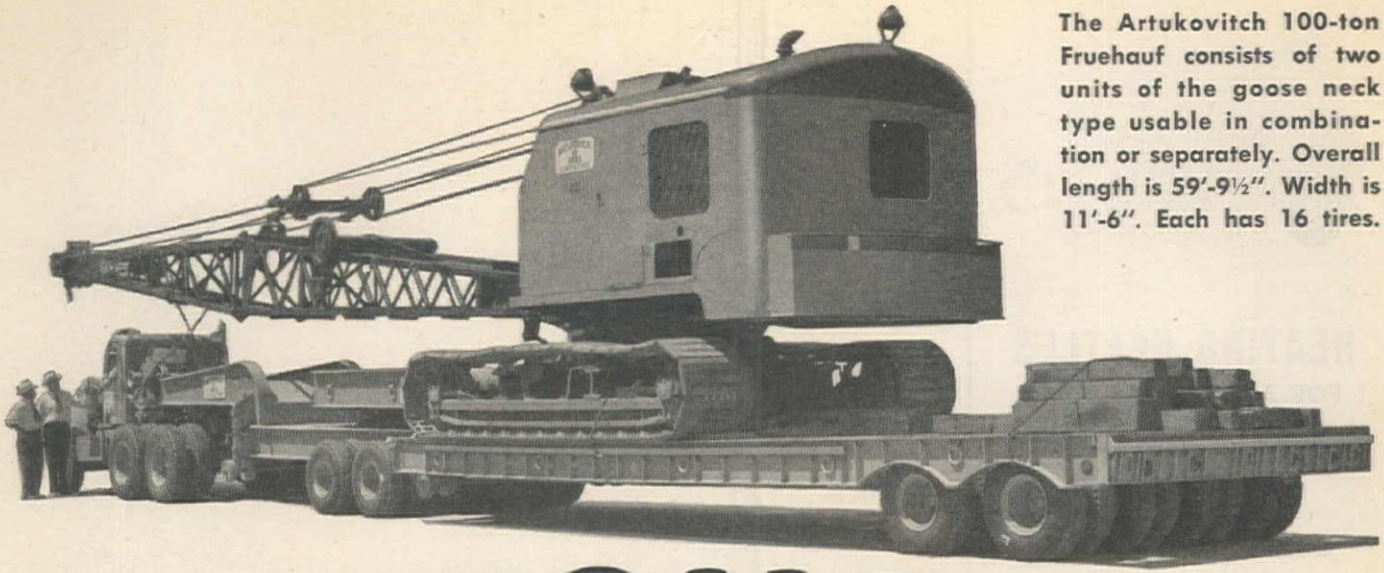


The Artukovitch 100-ton Fruehauf consists of two units of the goose neck type usable in combination or separately. Overall length is 59'-9½". Width is 11'-6". Each has 16 tires.

100-TONS PAYLOAD

ON FRUEHAUF CARRYALL

MEN who know best what it takes to safely haul extremely heavy machinery prefer Fruehauf Carryall Trailers. Among such men are the Artukovitch Brothers, general contractors and heavy hauling specialists, Hynes, Calif. Theirs is the knowledge gained only by experience — actually doing the things others say can't be done.

Artukovitch Brothers recently placed in service a Fruehauf combination Carryall Trailer capable of handling payloads of 100 tons. Special design and construction were required and Fruehauf engineers handled the job. Fruehauf's manufacturing plant has the facilities for building all types of special equipment.

Fruehauf is prepared to furnish any type of special-duty Trailer you may need. Included are Carryalls, Tiltdecks, Lowbeds and Dumpers. Each is built in the capacity best suited to your needs. All are scientifically engineered for the specific work they will be called upon to perform.

Fruehauf also builds a complete line of general freight and tank Trailers. You name the load — there's a Fruehauf built to haul it.

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY

Western Manufacturing Plant, Los Angeles

SALES AND SERVICE BRANCHES — LOS ANGELES • SAN FRANCISCO • SACRAMENTO • PORTLAND • SEATTLE • EL PASO
PHOENIX • SAN DIEGO • FRESNO • SPOKANE • BILLINGS • SALT LAKE CITY • DENVER

FRUEHAUF TRAILERS
"Engineered Transportation"
REG. U. S. PAT. OFF.

770 lin. ft. metal plate guard rail	2.20	3.50	2.50	3.50	2.20
870 cu. yd. excav. for pipe culverts	1.50	1.50	1.75	2.50	3.00
3,030 lin. ft. 18-in. V.C.P.	3.60	3.85	3.75	4.00	4.00
438 lin. ft. 24-in. V.C.P.	6.00	5.75	6.00	6.00	5.50
268 lin. ft. 30-in. C.M.P.	4.90	5.17	6.00	6.00	6.00
226 lin. ft. 36-in. C.M.P.	7.50	7.53	8.50	9.00	9.00
60 lin. ft. 42-in. C.M.P.	8.90	9.00	10.00	12.00	10.75
524 lin. ft. 48-in. C.M.P.	11.40	11.03	12.00	16.00	14.00
424 lin. ft. 13-in. x 22-in. C.M.P. arch culvert	2.90	2.79	3.00	4.00	3.30
86 lin. ft. 17-in. x 30-in. C.M.P. arch culvert	4.20	4.17	5.00	6.00	5.00
470 lin. ft. 12-in. std. R.C.P.	3.00	2.95	3.00	3.00	2.50
86.2 lin. ft. 18-in. siphon R.C.P.	6.00	7.50	6.00	6.00	4.00
87.3 lin. ft. 24-in. siphon R.C.P.	8.00	10.30	10.00	9.00	6.00
30 lin. ft. 12-in. nestable C.M.P.	3.20	3.00	3.50	3.50	3.25
498 lin. ft. 18-in. nestable C.M.P.	3.50	3.25	4.00	4.50	3.25
40 lin. ft. 24-in. nestable C.M.P.	5.30	5.15	7.00	6.00	4.15
0.518 M.B.M. untreated timber	200.00	180.00	200.00	350.00	200.00
100 ea. r/w markers	10.00	9.50	10.00	15.00	7.00
2 ea. R. C. project markers	15.00	15.00	25.00	25.00	35.00
630 cu. yd. structure excavation	3.00	5.00	3.00	3.50	3.00
1,160 hr. mechanical tamping	8.00	5.00	6.00	8.00	7.00
330 cu. yd. Class 1 riprap	12.00	10.00	14.00	10.00	20.00
50 cu. yd. grouted riprap	15.00	12.00	18.00	15.00	35.00
19,000 ton crushed gravel base course (1-in. max.)	.85	.68	.90	.77	.80
53,000 ton mi. haul of surfacing material	.12	.10	.10	.10	.095
1,900 cu. yd. binder	.20	.45	.40	.75	1.25
3,600 cu. yd. mi. haul of binder	.10	.15	.20	.25	.25
420 M. gal. watering (base)	2.80	4.00	2.00	2.00	2.50
150 hr. roller operation	9.00	7.00	6.00	6.00	6.00
12,500 lin. ft. std. r/w fence	.16	.16	.15	.20	.16
15,000 lin. ft. Type "A" r/w fence	.24	.25	.25	.25	.25
60 ea. end panels	20.00	14.00	15.00	13.00	9.00
75 ea. brace panels	15.00	9.00	15.00	10.00	7.00
1,153 cu. yd. Class "A" concrete	45.00	49.00	45.00	50.00	45.00
300 cu. yd. Class "A" concrete	45.00	55.00	45.00	50.00	45.00
147,605 lb. reinforcing steel	.10	.133	.12	.12	.10
169,020 lb. structural steel	.13	.152	.15	.16	.18
650 cu. yd. dry exc. for bridges	4.50	5.20	3.00	3.00	4.50
660 cu. yd. water exc. for bridges	4.50	5.20	5.00	12.00	4.50
3 mi. old road obliteration	500.00	100.00	300.00	500.00	500.00

California—Fresno County—Bur. of Recl.—Conc. Aggregates

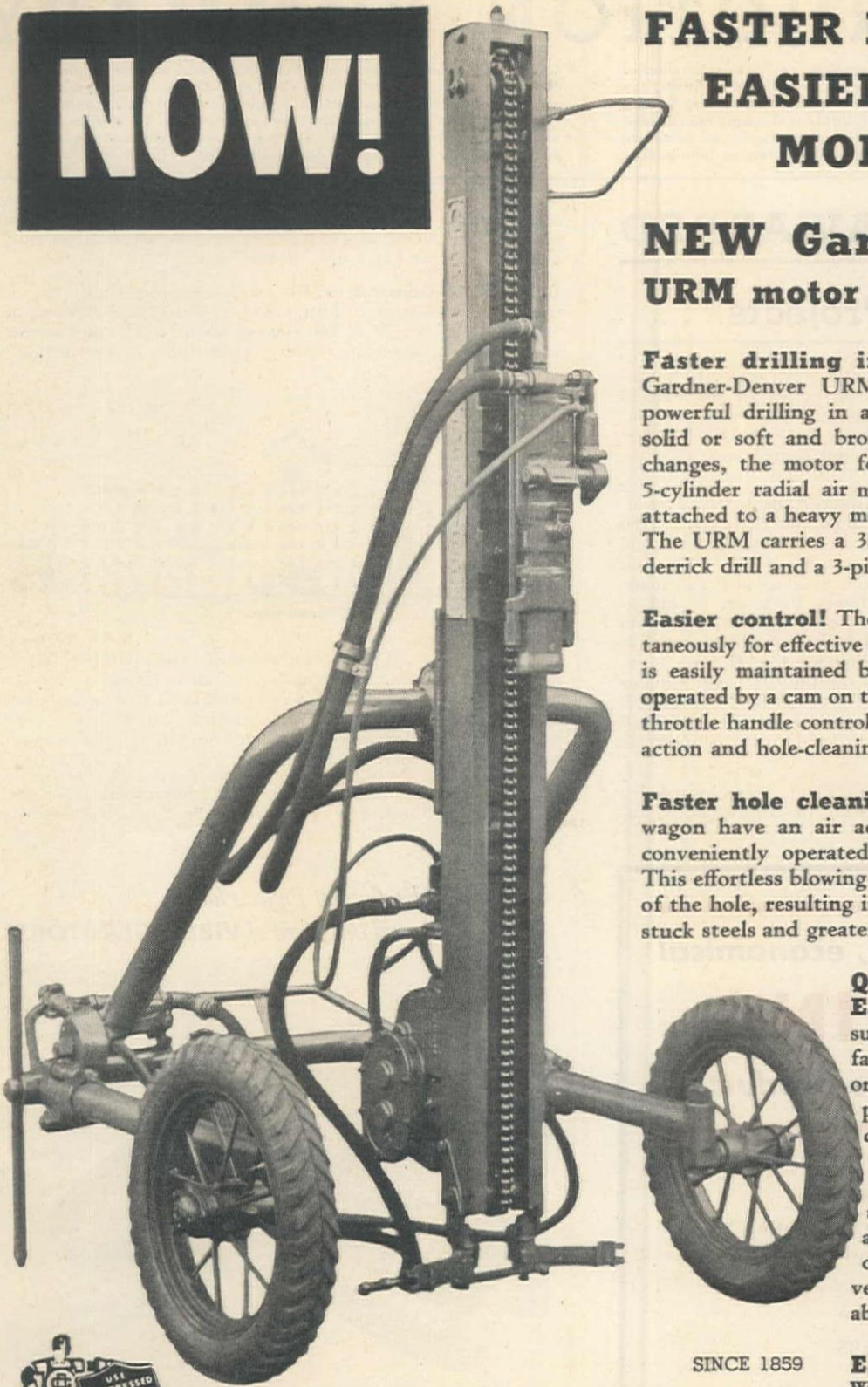
George Pollock Co., Sacramento, was awarded the $191,550 contract by the Bureau of Reclamation, Friant, for the preparation of concrete aggregates for the Friant-Kern Canal, Central Valley Project. The deposit is located near Friant. The following unit bids were submitted:

(1) George Pollock Co. $191,550
(2) John M. Ferry 201,000
(3) J. G. Shotwell $201,000

	(1)	(2)	(3)
75,000 cu. yd. excavation, stripping deposit	.20	.26	.15
60,000 cu. yd. prep. and stockpile sand	1.07	1.10	1.15
17,000 cu. yd. prep. and stockpile coarse aggregate ⅛ to ⅜ in.	1.07	1.10	1.15
38,000 cu. yd. prep. and stockpile coarse aggregate ⅜ to ¾ in.	1.07	1.10	1.15
50,000 cu. yd. prep. and stockpile coarse aggregate ¾ to 1½ in.	1.07	1.10	1.15

NOW!

FASTER DRILLING
EASIER CONTROL
MORE FOOTAGE



NEW Gardner-Denver
URM motor feed wagon drill

Faster drilling in any ground! The new Gardner-Denver URM Wagon Drill provides fast, powerful drilling in any kind of ground—hard and solid or soft and broken. Designed for 6-foot steel changes, the motor feed is operated by a powerful 5-cylinder radial air motor driving an endless chain attached to a heavy mounting slide carrying the drill. The URM carries a 3½" or 4" bore Gardner-Denver derrick drill and a 3-pint LO-11 Line Oiler.

Easier control! The feed can be reversed instantaneously for effective churning. Correct feed pressure is easily maintained by means of a regulating valve operated by a cam on the feed control handle. A single throttle handle controls drill operations, both hammer action and hole-cleaning air.

Faster hole cleaning! Drills used on the URM wagon have an air actuated exhaust control valve conveniently operated by the drill throttle handle. This effortless blowing induces more frequent cleaning of the hole, resulting in faster drilling, elimination of stuck steels and greater overall daily footage.

Quicker steel changes—Easier spotting! Drill steel support at top of mast assists in faster steel changing. Centralizer or hole spotter is held in place positively in both open and closed positions.

Wide flexibility! U-bar is adjustable from a position slightly above horizontal, through an arc of 90 degrees, to one practically vertical. Large wheels are adjustable to 90 degrees for line drilling.

Easily maneuverable! With its three pneumatic-tired wheels, the URM is easily moved over rough ground. The RM feed may be adjusted to any drilling position, vertical or horizontal. Adjustable mounting cone on mast allows rapid accommodation to suit ground condition.

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

USE COMPRESSED AIR FOR SAFETY CONVENIENCE FLEXIBILITY

SINCE 1859

GARDNER-DENVER

WESTERN BRANCH OFFICES:

Butte, Montana; Denver, Colorado; Los Angeles, California; Portland, Oregon; Salt Lake City, Utah; San Francisco, California; Seattle, Washington; Wallace, Idaho; El Paso, Texas.

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 . . .

Western Pipe & Steel Co., San Francisco, was awarded a contract on Schedule No. I, on the construction of the Second Mokelumne Aqueduct in Contra Costa, San Joaquin and Calaveras Counties, Calif. The contract price on Schedule No. I is $1,875,903, to furnish lined and lined and coated steel pipe for Unit C.

Western Pipe & Steel Co. was also awarded the $4,093,671 contract on Schedule No. II, to furnish lined and lined and coated steel pipe for Unit D. **P. & J. Artukovich** of Los Angeles, bid $1,095,429 on Schedule No. IV to construct the lined and coated steel aqueduct for Unit D. The final award was made to **United Concrete Pipe Corp.**, Baldwin Park, on its bid of $3,356,639, to furnish and install reinforced concrete aqueduct for Unit E. The East Bay Municipal Utility District located in Oakland, awarded the contracts totaling $10,421,642. The aqueduct will be 67-in. diameter and will be used to carry water under hydrostatic heads varying between 180 and 510 ft. The pipe will carry fifty million gallons of water a day, making two hundred million gallons available to two lines. The project is about 47 miles long.

Fredricksen & Kassler of Sacramento, Calif., were awarded a $1,338,523 contract by the State Division of Highways, Sacramento, Calif., for about 6.6 mi. of grading and surfacing with plant mix surfacing on crusher run base, between Miles Station and Marsh St. in San Luis Obispo County, Calif.

Del E. Webb Construction Co. of Los Angeles, Calif., will build the $2,103,699 hospital addition for the Veterans Administration, Washington, D. C., to be located about four miles south of Livermore in Alameda County, California. Plans include the

construction of a 119-bed Tuberculosis Hospital Building, one incinerator building, the building of an addition to the boiler house building and additions and alterations to existing kitchen and dining room building. The buildings are to have concrete foundations, reinforced concrete walls and floors, stucco exterior finish and tile roofs.

H. Earl Parker of Marysville, Calif., submitted the low bid of $532,850 to the Corps of Engineers in Sacramento, and was

awarded the contract for the excavation of the right abutment of the Pine Flat Dam in Fresno County, Calif.

Peter Kiewit Sons' Co., Omaha, Neb., and **Morrison-Knudsen Co., Inc.**, Boise, Idaho, were awarded a contract in the amount of $6,796,213 by the Corps of Engineers at Bismarck, North Dakota, for the construction of stage 2 of Riverdale, Garrison dam construction town. The work calls for the erection of 250 family dwelling units and 24 large buildings. The latter include a permanent brick administration bldg., retail shops, general store, church, hospital, theater, police station, utility shops and temporary school addition. The contract stipulates that work should be completed in 620 days from date of notice to proceed.

Wunderlich Contracting Company of Jefferson City, Mo., was low before the Corps of Engineers at Denver, Colo., and was awarded the contract with a bid of $7,995,-124 for the construction of an embankment and spillway for the earthfill dam on Cherry Creek. The work is located in Arapahoe County, Colo., about 6 mi. southeast of Denver, near the Kentwood Dam.

R. C. Briggs of San Francisco, Calif., will build 180 two and three bedroom, frame and stucco dwellings on a tract near Hwy. 40 west of Fairfield in Solano County, Calif. The work is being done for Charles Cournale of Vallejo and will cost $1,650,000.

W. T. Bookout Construction Co., Las Vegas, Nev., was low before the New Mexico State Highway Department at Santa Fe, with the bid of $754,288 for the construction of 6.5 mi. of U. S. Hwy. No. 66 in Bernalillo Co., between Albuquerque and Moriarty. The proposed construction consists of grading, minor drainage structures, four multiple concrete box culverts each over 20-ft. clear span, watering and rolling, leveling course, ballast, bituminous top coarse surfacing, sealing with asphalt and stone chips, and miscellaneous construction. The Bookout Construction Co. received the award.

Abbett Electric Co., San Francisco, Calif., on its bid of $587,383 was awarded the contract by the Bureau of Reclamation at Denver, Colo., for the construction of three 230-kv. transmission lines from Shasta to Cottonwood with Gas Point Road and Keswick tap lines, near Redding in Shasta County, Calif. The 230,000-v., 3-phase, 60-cycle, three-wire, single circuit, steel tower transmission lines have been designed for medium loading conditions of ¼-in. ice and a wind pressure of 4 lbs. per sq. ft.

Robert E. McKee, Los Angeles, Calif., was awarded a contract amounting to $2,162,865 for the construction of three projects at Los Alamos, New Mexico. $1,805,462 will be spent for the construction of six brick and tile bldgs.; $249,300 to be used for the erection of a concrete addition to the existing power plant; and $108,103 will be spent on the building of diesel plant piping for power plant addition. The U. S. Atomic Energy Commission at Santa Fe made the awards.

Stolte, Inc., Oakland, Calif., was awarded a $486,036 contract by the Central Contra Costa Sanitary District of Walnut Creek, Calif., for the installation of about 8 mi. of trunk sewer in Contra Costa County between the proposed treatment plant site north of the Arnold Hwy. near Pacheco to a point opposite Newell Ave. on State Hwy. No. 21, near Walnut Creek. 270 days allowed for completion.

Guy F. Atkinson Co., San Francisco, Calif., was awarded a contract in the sum of $643,400 by the Bureau of Reclamation at Columbia Falls, Montana, for the construction of a horseshoe shaped, 1,100-ft. long tunnel which will be used to divert the waters of the south fork of the Flathead River during the construction of the Hungry Horse Dam. The work is located approximately 30 mi. northeast of Kalispell, Mont., in Flathead County. 250 days are allowed for completion.

The General Construction Co., Portland, Ore., was awarded a $1,830,852 contract by the City Council of Portland for the construction of a new lumber dock at 2500 N.W. Front Ave., Portland. The dock will be 600 ft. long and will provide storage space for 30,000,000 ft. of lumber.

American Pipe & Construction Co., Los Angeles, Calif., was awarded by the Water Authority, San Diego, Calif., a contract in the amount of $358,699 under Schedule No. I-C to install 53,800 ft. of 14-in. reinforced concrete cylinder pipe in the westerly section of Fallbrook-Oceanside branch of the San Jacinto-San Vicente aqueduct, Station 316 + 16 to Station 852 + 21. The work is located in the unincorporated areas of San Diego County, Calif.

Guy F. Atkinson Co., of Portland, submitted the low bid of $1,096,510 before the Corps of Engineers at Portland, for the construction of a cofferdam for McNary Dam on the north bank of the Columbia River approx. 3 mi. upstream from Plymouth in Benton County, Ore. Shore arms of rock are to be constructed and sealed with impervious clay and silt material which is found near the site of construction.

S. J. Groves & Sons Co., Minneapolis, Minn., was awarded the $360,512 contract by the Corps of Engineers at Bismarck, N. D., for the construction of 8 mi. of spur track from the existing government owned railroad at Riversdale, N. D., to the construction bridge at Garrison Dam and Reservoir in McLean County, North Dakota.

Highway and Street . . .

Arizona

PIMA CO.—**Vinnell Co.**, 1145 Westminster Ave., Alhambra—$238,481 for 7.4 mi. grade, drain, base and bitum. surf. of Tucson-

Ajo Hwy., from a point approx. 8 mi. east of Sells northeast toward Tucson—by State Highway Department, Phoenix. 11-25

PINAL CO.—**J. E. Skousen,** 243 W. 1st Ave., Mesa—$123,801 for grade, drain, base and surf. of Superior-Miami Hwy., 3.5 mi. northeast of Superior extending easterly—by State Highway Department, Phoenix. 11-19

California

KINGS CO.—**C. M. Syar,** Box 1431, Vallejo—$149,866 for 5.3 mi. grade, surf. and pave, betw. Corcoran and 5.3 mi. north—by Division of Highways, Sacramento. 11-18

LOS ANGELES CO.—**Spicer Co.,** Box 8383, W. Adams Station, Los Angeles—$311,630 for 2.2 mi. grade and surf. on Ventura Blvd. from Calabasas west — by Division of Highways, Sacramento. 11-19

NEVADA CO.—**Fredrickson Bros.,** 1259 65th St., Emeryville—$341,522 for 3.8 mi. grade and plant mix surf. on crusher run base, betw. Rattlesnake Creek and Grass Valley—by Division of Highways, Sacramento. 11-1

ORANGE CO.—**O'Brien & Bell Construction Co.,** 1123 Freeman St., Santa Ana—$94,044 for 1.8 mi. widening and surf. betw. San Diego Co. line and Valencia St., San Clement—by Division of Highways, Sacramento. 11-5

SAN LUIS OBISPO CO.—**Fredricksen & Kassler,** 212 13th St., Sacramento—$1,338,523 for 6.6 mi. grade and surf., betw. Miles Station and Marsh St.—by Division of Highways, Sacramento. 11-12

Idaho

BOUNDARY CO.—**Grant Construction Co.,** Springville, Utah —$293,338 for 11.2 mi. section of Priest River road, near Sand Point, Idaho Forest Project 6-H, Unit I, Kaniksu National Forest—by Bureau of Highways, Boise. 11-1

Kansas

ROOKS CO.—**Adrian L. Schweitzer,** Osborne—$122,747 for 9.6 miles of grading—by State Highway Commission, Topeka. 11-1

Montana

ROSEBUD CO.—**R. P. Herrick Co.,** Lewishon Bldg., Butte, and **Inland Construction Co.,** 3867 Leavenworth St., Omaha, Nebr.—$228,396 for oil on a gravel and sand base on the Ingomar east section of Roundup-Forsyth Hwy.—by State Highway Commission, Helena. 11-1

SANDERS CO.—**Max J. Kuney Co.,** Box 4008, Station B, Spokane, Wash.—$163,742 for State Project No. 6-J2, Clark Fork Hwy. in the Cabinet National Forest—by Public Roads Administration, Salt Lake City.

Nevada

CLARK CO.—**Olof Nelson Construction Co.,** Box 413, Logan, Utah—$224,974 for hwy. improvement in Las Vegas—by Department of Highways, Carson City. 11-7

WASHOE CO.—**Nevada Constructors, Inc.,** 1203 E. 2nd St., Reno—$100,997 for 2.9 mi. grade and surf., from east city limits of Reno to Glendale by way of 2nd St. and Glendale Rd.—by Department of Highways, Carson City. 11-1

WHITE PINE CO.—**Silver State Construction Co.,** Fallon—$250,570 for 15.2 mi. grade and surf. from Magnuson's Ranch to approx. 15 mi. north, State Hwys. 2 and 24, Sections E2, A, B—by Department of Highways, Carson City. 11-12

New Mexico

CURRY CO.—**Wheeler & Trotz,** Albuquerque—$61,216 for 11 mi. grade, drain, rolling and leveling course, etc., on State Hwy. No. 89, betw. Weber City and Claud—by State Highway Department, Santa Fe. 11-13

LINCOLN CO.—**Brown Contracting Co.,** Box 1479, Albuquerque—$205,432 for 5.9 mi. grade, base, surf., and six multiple conc. box culverts on U. S. Hwy. No. 54 betw. Carrizozo and Tularosa—by State Highway Department, Santa Fe. 11-18

SIERRA CO.—**Floyd Haake,** 1201 Sierra Vista, Santa Fe—$50,491 for 6.1 mi. grade, base and surf. of State Hwy. No. 52 betw. Cuchillo and Hot Springs — by State Highway Department, Santa Fe. 11-18

TORRANCE CO.—**G. I. Martin Construction Co.,** 520 S. Tulane St., Albuquerque—$190,155 for 8.4 mi. grade, base and surf. and one multiple conc. box culvert 121.6 ft. in length on State Hwy. No. 10 betw. Mountainair and Gran Quivira—by State Highway Department, Santa Fe. 11-18

Oregon

LANE CO.—**Cosmo Gilo,** Portland—$206,945 to build Blue River timber access road east of Eugene—by Public Roads Administration, Portland. 11-8

Utah

UTAH CO.—**W. W. Clyde & Co.,** Springville—$63,483 for constr. of 2-in. road mix surf. of State Hwy. No. 147—by State Road Commission, Salt Lake City. 11-21

Washington

GRAYS HARBOR CO.—**N. Fiorito Co.,** 844 W. 48th St., Seattle—$281,568 for 12.5 mi. grade and surf. of Primary State Hwy. No. 9, betw. junct. of Sec. State Hwy. No. 9-C and Humptulips to Stevens Creek—by Department of Highways, Olympia. 11-5

Bridge & Grade . . .

California

MENDOCINO CO.—**Johnston Rock Co.,** Weber Ave. and E St., Stockton—$397,578 for struct. steel bridge on reinf. conc. piers and abutments across Navarro River approx. 4 mi. south of Albion—by Division of Highways, Sacramento. 11-12

SACRAMENTO CO. — **Judson-Pacific-Murphy Corp.,** 4300 E. Shore Highway, Emeryville—$542,914 for superstruct. for bridge across Three Mile Slough, approx. 4 mi. south of Rio Vista—by Division of Highways, Sacramento. 11-12

YOLO CO. — **Chittenden & Chittenden,** Box 246, Auburn — $51,148 for a timber trestle bridge with reinf. conc. deck across, Knights Landing Ridge Cut Canal, about 3 mi. south of Knights Landing—by Division of Highways, Sacramento. 11-20

Montana

CUSTER CO.—**Heald Construction Co.,** Cody, Wyo. — $146,316 for 8.3 mi. grade, drain and surf., and constr. of three treated timber pile bridges on Miles City-Garland rd.—by State Highway Commission, Helena. 11-1

POWELL CO.—**F. & S. Contracting Co.,** Butte—$269,775 for 4.5 mi. hwy. improvement, constr. of steel and conc. bridge substruct. and widen exist. bridge—by State Highway Commission, Helena. 11-1

RAVALLI CO.—**W. P. Roscoe Co.,** Billings—$105,269 for steel and conc. bridge across Bitterroot River on Grantsdale bridge road—by State Highway Commission, Helena. 11-1

SANDERS CO.—**McRae Bros.,** 2733 4th Ave., So., Seattle, Wash.—$300,000 for conc. and steel foundation support for a bridge to be constr. west of Thompson Falls near Belknap, crossing Clarke Fork—by Northern Pacific Railway Co., Billings. 11-1

New Mexico

BERNALILLO CO. — **W. T. Bookout Construction Co.,** Box 298, Las Vegas—$754,288 for 6.5 mi. grade, minor drain structs., four multiple conc. box culverts ea. over 20 ft. clear span, surf. and seal coat of U. S. Hwy. No. 66, btw. Albuquerque and Moriarty—by State Highway Department, Santa Fe. 11-3

CATRON CO.—**Skousen Construction Co.,** Springer Bldg., Albuquerque—$276,653 for 16.5 mi. grade drain structs., five multiple conc. box culverts, ballast, bitum. top


PACIFIC
SUPER STEEL
PREFORMED
WIRE ROPE
PACIFIC WIRE ROPE COMPANY
LOS ANGELES 21, CALIF., U.S.A. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

course surf. and seal coat on U. S. Hwy. No. 60, betw. Red Hill and Quemado—by State Highway Department, Santa Fe. 11-13

Utah

GRAND CO.—**Rowland & Cook,** 1568 South 11th E., Salt Lake City—$98,703 for four conc. and steel bridges on U. S. Hwys. No. 6 and 50, betw. Green River-Thompson—by State Road Commission, Salt Lake City. 11-21

PIUTE CO.—**Reynolds Construction Co.,** Springville—$95,618 for one conc. and one timber bridge and 4.3 mi. gravel surf. of State Hwy. No. 22, betw. Kingston and Antimony—by State Road Commission, Salt Lake City. 11-18

SEIVER CO.—**L. A. Young Construction Co.,** Beacon Bldg., Salt Lake City—$96,748 for 6.6 mi. bitum. surf. and constr. of two conc. box culverts, betw. Annabella and Central and Venice West and Venice North—by State Road Commission, Salt Lake City. 11-5

Washington

KING CO.—**American Pile Driving Co.,** Everett—$94,000 under alternate A, for reinf. conc. box girder bridge across Cedar River at Long St., Renton—by City Council, Renton. 11-1

OKANOGAN CO.—**Sather & Sons,** 1410 Howe St., Spokane—$125,246 for steel and conc. bridge and 1.2 mi. grade and surf., Primary State Hwy. No. 10, near Brewster—by Department of Highways, Olympia. 11-3

SKAGIT CO.—**C. B. Croy,** Bellingham—$59,271 for three reinf. conc. girder bridges over Childs and Alder Creeks on State Secondary Hwy. No. 17-A—by Department of Highways, Olympia. 11-7

Water Supply . . .

California

ALAMEDA AND CONTRA COSTA COS.—**Elmer J. Freethy,** 1432 Keaney St., El Cerrito—$181,554 for constr. of two prestressed reinf. conc. reservoirs, 3,000,000-gal. Colorado Reservoir and the 3,000,000-gal. Oak Knoll Reservoir—by East Bay Municipal Utility District, Oakland. 11-17

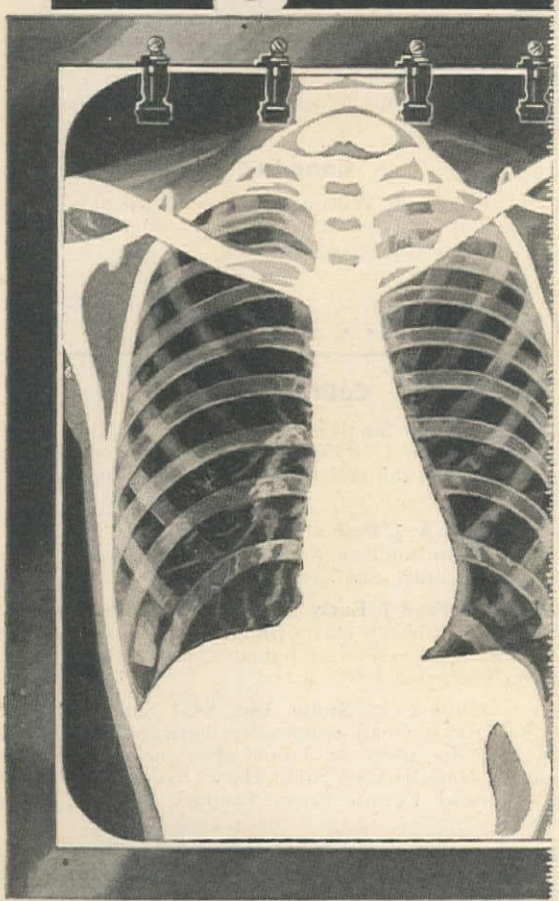
LOS ANGELES CO.—**James R. Mathews Excavating Co.,** 11000 Westminster Ave., Alhambra—$48,376 for 1,000,000-gal. reservoir and pump house, Arcadia—by City Council, Arcadia. 11-10

ORANGE CO.—**A. B. C. Construction Co.,** 810 N. Lakewood Blvd., Hynes—$237,438 for water mains, house connections, pump station and reservoir, South Laguna—by City Water District, South Laguna. 11-7

ORANGE CO.—**Spencer Webb Co.,** Box 921, Inglewood—$168,145 for infiltration pipeline extension downstream from Prado Dam—by County Flood Control District, Santa Ana. 11-12

SAN DIEGO CO.—**American Pipe & Construction Co.,** 4635 Firestone Blvd., Los Angeles—$358,699 on Schedule I-C for 53,800 ft. of 14-in. reinf. conc. cylinder pipe to be installed in Westerly Section of Fallbrook-Oceanside branch of San Jacinto-San Vicente aqueduct, Station 316 + 16 to Station 852 + 21,

Danger signal!



DO YOU KNOW . . . that in America today there are approximately 250,000 people with "unknown cases" of tuberculosis?

. . . that these "unknown cases" are a major reason why TB still kills more Americans between 15 and 44 than any other disease — as they unwittingly spread infection, maybe to you, yourself, or a loved one?

. . . that the surest means of discovering TB early, before it spreads, is the chest X-ray?

. . . that your Christmas Seal money buys X-ray units and makes possible mass examinations?

PLEASE, send in your contribution today.

Buy Christmas Seals

Because of the importance of the above message, this space has been contributed by

WESTERN CONSTRUCTION NEWS

503 Market Street, San Francisco 5, California

GOVERNMENT OF INDIA, INDIA SUPPLY MISSION

635 F. Street, N.W. Washington 4, D. C.

NOTIFICATION

INVITATION (REFERENCE NO. 3894) TO CONTRACTORS WITH EXPERIENCE IN LARGE DAM CONSTRUCTION

to submit a statement of their PRE-QUALIFICATIONS

I. The Madras Government propose to invite in due course bids for the construction of the RAMAPADASAGAR DAM (called RPS Dam for future reference) across the Godavari River in the Madras Presidency (India).

II. Its UNIQUE FEATURES are:

1. The bed rock is at various depths below the bed and at the deepest point AS MUCH AS 200 FEET DEPTH OF EXCAVATION through overburden consisting of sand, clay and occasional pebbles would be involved.
2. SEEPAGE through a SANDY STRATUM is likely to be VERY HIGH and a pumpage as much as 150,000 TO 200,000 gallons per minute during the flood season going down to about 60,000 gallons per minute during the dry season may have to be contended with.
3. COMPOSITE COFFERDAM consisting of a HIGH MASONRY WALL to a height of 120' and CELLS OF SHEET PILES one or two rows may be required. Also high earthen roll fill cofferdam to a height of 50' to 60' above bed might be required.
4. The river will be in FLOODS which may reach in an average year a peak of 2 MILLION CUBIC FEET PER SECOND in the months of July, August and September. A thousand year flood is estimated at 3 million cubic feet per second. A Hydrograph of an average year is found in RPS plan NO. CON 1. Low water season with an average discharge of 40,000 cubic feet per second will start in November and the discharge will gradually dwindle down to 3,000 cubic feet per second by March and April.
5. It is planned to build the COFFERDAM and then EXCAVATE AND PLACE CONCRETE both in the LOW WATER and in the FLOOD SEASON.
6. In order to get through the foundation work as quickly as possible and to maintain the cofferdam only for the absolute minimum period, it is expected that CONCRETE PLACING for the dam may have to reach the peak of 15,000 C. YDS. PER DAY.
7. The whole construction of the dam is planned to be completed in a period of 8 to 9 years.

III. Other main features of the dam are:

(1) Cross section of the river at the dam site is in RPS plan No. CON 3. It will be noticed that there is a CENTRAL OUTCROP OF ROCK, which is proposed to be USED to ISOLATE THE RIGHT HALF of the river by building a cofferdam as shown in RPS Plan No. CON 4. After the right side foundation is raised to a level of say +20, +30 or +50 the diversion of the river will change over to the right and the left cofferdam will be formed and the left half of the dam raised to +50 or +70.

(2) Tentative cofferdam designs have been drawn up but the CONTRACTORS WILL BE FREE TO IMPROVE on it to the satisfaction of the Chief Engineer of the Government.

IV. Other salient features are:

(a) Full reservoir level +198.
(b) Length of dam 6600 feet at road level.
(c) Tentative overflow section left side 2100', right side 2100'.
(d) Drum gate clear span 135', height of shutters 18' or 28'.
(e) Water spread 527 sq. miles.
(f) Level of road way over the dam +237.82.
(g) Contents of the dam 8 million c. yds.
(h) Excavation in rock in foundation ½ million c. yds. approximately.
(i) Excavation in other soils in foundations 20 million c. yds. approximately.
(j) Height of dam from bottom-most point 428'.
(k) Number of Hydro electric pipes 7.
(l) Size of Hydro electric pipes 18' diameter.
(m) Power house in rear of right flank of the dam 6 units of about 33 thousand Kilowatt capacity.

V. The Preliminary plans mentioned above are available for inspection at the Government of India, India Supply Mission, 635 F. St., N.W., Washington, D. C.

VI. CONTRACTORS DESIROUS TO OFFER BID FOR THE DAM with reference to detailed plans and specifications to be supplied later, should furnish to the Government of India, India Supply Mission, 635 F. St., N.W., Washington, D. C., a CERTIFIED STATEMENT in triplicate, before December 31, 1947, OF THEIR PREVIOUS QUALIFICATIONS, and

1. Experience in the construction of LARGE CONCRETE DAMS.
2. EXPERIENCE IN UNWATERING DEEP FOUNDATIONS WITH HEAVY SEEPAGE.
3. A statement of WORKS UNDERTAKEN AND EXECUTED BY THEM PREVIOUSLY. Qualifications and experience of individual Engineers and other personnel on the staff of the contractors.
4. Experience in respect of MANAGEMENT IN LARGE CONTRACTS. Total volume and cost of works executed and financial position of the contractors.
5. Owners of work executed by them to whom the Madras Government may make reference in regard to their financial stability and qualifications.
6. PLANT AND MACHINERY the contractors have ON HAND or can get immediately to start the work and their CAPACITY TO PROCURE ANY ADDITIONAL MACHINERY REQUIRED.
7. EXPERIENCE in large construction operations ABROAD.
8. Special claims if any.
9. Whether the APPLICANTS will operate SINGLY OR IN CO-ORDINATION WITH OTHERS. If with others, their qualifications under the several heads.

VII. The contract can be of the following alternative forms.

1. (a) Unit price for concrete, excavation and other measurable items involving no risk, plus a fixed fee—the fee to be on a sliding scale and to start only when the foundations are laid.

(b) Cost plus a percentage for contractors' overheads, plus a fee for items of work involving risks such as Cofferdam, pumping, etc.

2. (a) Common estimate for known items such as concrete, excavation, etc. agreed to between the contractors and the Government plus a fee on a sliding scale; saving effected on agreed estimate being shared between the contractor and the Government and reasonable excess over the agreed estimate being met by the Government.

(b) Cost plus a percentage for contractors' overheads, plus a fixed fee for items of work involving risks such as Cofferdams, pumping, etc., the fee to be on a sliding scale and to start only when the foundations are laid.

The applicant's PREFERENCE for EITHER OF THE TWO methods or for any other that he may suggest can be given. The applicant's PREFERENCE TO COMPETITIVE BID OR NEGOTIATED CONTRACTS may also be given. The applicant's preference to furnish surety bonds, performance bonds, may also be indicated.

N. B. The Madras Government reserves the right to ignore any or all applications against this invitation without assigning reasons for such action.

located in the unincorporated areas of the county—by San Diego Water Authority, San Diego. 11-19

SANTA CLARA CO.—**Frank Rossetta Construction Co.,** Box 426, Walnut Creek—$73,699 for water mains to be installed in Stanford Water District and south of city limits, Palo Alto—by City Council, Palo Alto. 11-19

VARIOUS COS.—**P. & J. Artukovich,** 13305 S. San Pedro St., Los Angeles—$1,095,429 on Schedule No. IV, Second Mokelumne Aqueduct, for constr. of aqueduct for Unit D—by East Bay Municipal Utility District, Oakland. 11-7

VARIOUS COS.—**United Concrete Pipe Corp.,** Box 1, Sta. H, Los Angeles—$3,356,639 for reinf. conc. aqueduct for Unit E, Second Mokelumne Aqueduct—by East Bay Municipal Utility District, Oakland. 11-7

VARIOUS COS.—**Western Pipe & Steel Co.,** 200 Bush St., San Francisco—$4,093,671 on Schedule No. II, Second Mokelumne Aqueduct, to furn. lined and lined and coated steel pipe for Unit D—by East Bay Municipal Utility District, Oakland. 11-7

VARIOUS COS.—**Western Pipe & Steel Co.,** 200 Bush St., San Francisco—$1,875,903 on Schedule No. I, Second Mokelumne Aqueduct, to furn. lined and lined and coated steel pipe for Unit C—by East Bay Municipal Utility District, Oakland. 11-7

Utah

SAN JUAN CO.—**Black & Harvey,** Blanding—$36,836 for culinary water supply line and appurtenances in Blanding—by City Council, Blanding. 11-18

Canada

ALBERTA—**Wilson & Wilson,** Edmonton—$88,651 for labor only for installation of one-third of west end relief sewer at Edmonton—by City Council, Edmonton. 11-1

Sewerage . . .

California

ALAMEDA CO. — **Stanley H. Koller,** 1694 Pomona St., Crockett—$336,772 for Unit No. I, 23rd Ave. sewerage separation project, from Foothill Blvd. south, Oakland—by City Council, Oakland. 11-10

ALAMEDA CO.—**A. J. Peters & Son,** 410 N. 10th St., San Jose—$134,715 for main domestic and industrial sewers in San Leandro—by City Council, San Leandro. 11-6

AMADOR CO.—**Fred J. Early Jr., Co.,** 369 Pine St., San Francisco—$54,747 to improve exist. Imhoff tank and constr. add. tank, etc., at Preston School of Industry, Ione—by Division of Architecture, Sacramento. 11-12

CONTRA COSTA CO.—**Stolte, Inc.,** 8451 San Leandro St., Oakland—$486,036 for main trunk sewer betw. proposed sewage treatment plant site, north of Arnold Hwy. near Pacheco to a point opposite Newell Ave., State Hwy. No. 21 near Walnut Creek—by Central Contra Costa Sanitary District, Walnut Creek. 11-20

LOS ANGELES CO.—**M. S. Mecham & Sons,** 1210 W. 48th St., Los Angeles—$119,457 for one mi. of street improvement betw. Clark and Woodruff Aves.—by Board of Supervisors, Los Angeles. 11-7

VENTURA CO.—**Fred J. Early Jr. Co., Inc.,** 369 Pine St., San Francisco—$214,615 for completion of sewage plant at Camarillo State Hospital—by Division of Architecture, Sacramento. 11-14

Utah

IRON CO.—**Whitney, Woodard & Christensen,** Provo—$37,855 for sanitary sewer system in Cedar City—by City Council, Cedar City. 11-18

Waterway Improvement . . .

California

SAN DIEGO CO.—**Franks Dredging Co.,** 845 Ventura Pl., Mission Beach—$289,440 for dredging of Mission Bay Causeway and De Anza Cove, San Diego—by City Council, San Diego. 11-1

SAN FRANCISCO CO.—**Fredrickson & Watson Construction**

Co., 873 81st Ave., Oakland—$135,777 for excavation and fill at Naval Shipyard, San Francisco—by Public Works Office, San Francisco. 11-21

Idaho

JEFFERSON CO. — **Nic Burggraf**, Box 397, Idaho Falls — $56,874 for channel improvement on the Snake River, in Heise-Roberts area, approx. three mi. southeast of Labelle—by Corps of Engineers, Boise. 11-1

MADISON CO.—**Jack C. Olson**, Lorenzo—$70,156 for levee embankment and bank protection work on right bank of Snake River, approx. two mi. northwest of Lorenzo—by Corps of Engineers, Boise. 11-1

Oregon

MULTNOMAH CO. — **General Construction Co.**, Box 3860, Portland—$1,830,852 for lumber dock at 2500 N.W. Front Ave., Portland—by City Council, Portland. 11-1

MULTNOMAH CO.—**General Construction Co.**, Box 3860, Portland—$106,000 for a 570 by 30-ft. timber pier at Linnton terminal, Portland—by General Petroleum Corp., Portland. 11-1

Washington

KITTITAS CO.—**J. A. Terteling & Sons, Inc.**, Box 1428, Boise, Idaho—$43,750 to cut pilot channel, approx. 100 ft. wide and 1,300 ft. long in Yakima River, 6 mi. east of Cle Elum—by Corps of Engineers, Seattle. 11-1

THURSTON CO.—**Puget Sound Bridge & Dredging Co.**, 2929 16th Ave., S.W., Seattle—$51,851 for dredging and bulkheading site for city sewage disposal plant in tidelands, Olympia—by City Council, Olympia. 11-5

Dam . . .

California

FRESNO CO.—**H. Earl Parker**, 12th and F Sts., Marysville—$532,650 for excav. of right abutment of Pine Flat Dam—by Corps of Engineers, Sacramento. 11-12

Colorado

ARAPAHOE CO.—**Wunderlich Contracting Co.**, 219 E. High St., Jefferson City, Mo.—$7,995,124 for embankment and spillway for earthfill dam on Cherry Creek, near Denver—by Corps of Engineers, Denver. 11-24

Oregon

BENTON CO.—**Guy F. Atkinson Co.**, Cascade Bldg., Portland—$1,096,510 for constr. of cofferdam for McNary Dam on north bank of Columbia River, approx. 3 mi. upstream from Plymouth—by Corps of Engineers, Portland. 11-3

Tunnel . . .

Montana

FLATHEAD CO.—**Guy F. Atkinson Co.**, 10 W. Orange Ave., South San Francisco, Calif.—$643,400 for 1,000 ft. long tunnel, south fork of Flathead River, approx. 9 mi. southeast of Columbia Falls—by Bureau of Reclamation, Columbia Falls. 11-6

Washington

KING CO.—**W. E. Beggs Co.**, 234 9th Ave. N., Seattle—$253,645 mechanical work on utility tunnel between Boiler Plant Bldg. and Division of Health Sciences Bldg., University, Seattle—by Board of Regents, University of Washington, Seattle. 11-10

KING CO.—**M. P. Munter**, Vance Bldg., Seattle—$274,000 general work on 2,600-ft. long, 6-ft. wide and 7-ft. high tunnel betw. Boiler Plant Bldg. and Division of Health Sciences Bldg., University, Seattle—by Board of Regents, University of Washington, Seattle. 11-10

Power . . .

California

SHASTA CO.—**Abbett Electric Co.**, 472 Tehama St., San Francisco—$587,383 for three transmission lines near Redding—by Bureau of Reclamation, Denver, Colo. 11-5

Montana

VALLEY CO.—**Northern Electric Co-op,** Opheim—$46,748 for labor only on 64 mi. of distribution and transmission line—by Rural Electrification Administration, Washington, D. C. 11-1

Nebraska

VARIOUS COS.—**R. N. Campsey Construction Co.,** 2520 Leyden St., Denver, Colo.—$210,695 for transmission line from substation at Gering extending 35 mi. to proposed Bridgeport substation and from there for 5 mi. to proposed substation near Sidney—by Bureau of Reclamation, Denver, Colo. 11-13

Texas

CLAY CO.—**W. J. Thomas & Co.,** Dallas —$44,648 labor only on 197 mi. of line to serve 257 consumers—by J. A. C. Electric Co-op Assn., Bluegrove. 11-1

Washington

SPOKANE CO. — **Agutter Electric Co.,** Seattle—$45,016 for labor only on 33 mi. of transmission line—by Inland Empire Rural Electrification, Inc., Spokane. 11-1

Building . . .

California

ALAMEDA CO.—**Central California Construction Co.,** 116 Erie St., San Francisco —$253,412 for frame and stucco school bldg., Thomas Jefferson School, Midway Ave., San Leandro—by Board of Education, San Leandro. 11-12

ALAMEDA CO.—**Willis F. Lynn,** 1040 Folger Ave., Berkeley—$215,850 for erection and completion of four exhibit bldgs. and three barns, Alameda County Fair Grounds, Pleasanton—by County Board of Supervisors, Oakland. 11-12

ALAMEDA CO.—**Pacific Coast Builders,** 2530 18th St., San Francisco—$236,399 for reinf. conc., two-story school bldg., Howe St. and Ridgeway Ave., Oakland — by Roman Catholic Archbishop, San Francisco. 11-21

ALAMEDA CO.—**Clarence H. Thrams,** 1100 Sixth Ave., Oakland — $200,000 for struct. steel warehouse on Ninth Ave. near San Leandro Blvd., Oakland—by Gerber Products Co., Oakland. 11-13

ALAMEDA CO.—**Del E. Webb Construction Co.,** 5101 San Fernando Rd. W., Los Angeles—$2,103,699 for additions and improvements to Veterans Hospital, 4 mi. south of Livermore—by Veterans Administration, Washington, D. C. 11-24

CONTRA COSTA CO. — **Swinerton & Walberg,** 225 Bush St., San Francisco—will build reinf. conc. office bldg., second unit of $2,000,000 plant, near Antioch—by Fibreboard Products Co., San Francisco. 11-4

FRESNO CO.—**Fisher & McNulty,** Fulton Bldg., Fresno—$600,000 for reinf. conc., telephone central exchange office bldg., Mora Ave. and Hampton Way, Fresno—by Pacific Telephone & Telegraph Co., San Francisco. 11-1

FRESNO CO. — **Larsen & Ratto Construction Co.,** 1901 Hedges St., Fresno—$136,743 for elementary school bldg., Prince-

ton and Blackstone Sts., Fresno—by Board of Education, Fresno. 11-1

KERN CO. — **George B. Thatcher,** 4074 Laurel Canyon Blvd., No. Hollywood—$108,000 for completion of 70 units of veteran court dwellings, 34th Ave., Bakersfield—by County Housing Authority, Bakersfield. 11-28

KERN CO. — **M. & K. Corp.,** Financial Center Bldg., San Francisco—will build a steam power plant adjacent to the Midway Steam Plant approx. 1.5 mi. east of Buttonwillow—by Pacific Gas & Electric Co., San Francisco. 11-13

KINGS CO.—**H. H. Larsen Co.,** 64 S. Park St., San Francisco—$270,000 for telephone exchange bldg., Hanford—by Pacific Telephone & Telegraph Co., San Francisco. 11-1

LOS ANGELES CO.—**Daview, Keusder & Brown,** 4915 Exposition Blvd., Los Angeles—$381,600 for administration, kindergarten and seven classroom units, Warren Lane School, Inglewood — by Board of Education, Inglewood. 11-3

LOS ANGELES CO.—**Macco Corp.,** 816 N. Paramount Blvd., Clearwater — will build a reinf. conc. conduit for steam plant at Long Beach — by Southern California Edison Co., Los Angeles. 11-25

LOS ANGELES CO.—**Arthur Pinner, Jr.,** 116 W. 94th St., Los Angeles—$417,000 general work on constr. of two reinf. conc., one-story ward bldgs., Pacific Colony, Spadra—by Division of Architecture, Sacramento. 11-21

LOS ANGELES CO.—**Arthur Pinner, Jr.,** 116 W. 94th St., Los Angeles—$169,000 for high school laboratory bldg. and ground equipment, 241 Moreno Dr., Beverly Hills—City Unified School District, Beverly Hills. 11-10

LOS ANGELES CO.—**Rankin Construction Co.,** 117 So. Maryland Ave., Glendale—$125,463 for construction of a fire station bldg., at 2824 So. Main St., Los Angeles—by Public Works Department, Los Angeles. 11-28

LOS ANGELES CO.—**Ben K. Tanner & Son,** 371 S. Robertson Blvd., Beverly Hills—$200,000 for reinf. brick, two-story high school bldg., Glenoaks Blvd., near Burbank—by Missionary Sisters of Sacred Heart, Burbank. 11-12

MARIN CO.—**A. Von Rotz,** 23 Brookside Dr., San Anselmo—$135,000 for frame and stucco, 16-unit apartment bldg., Lincoln Ave. near Laurel Pl., San Rafael—by A. Berghini, San Rafael. 11-14

MERCED CO. — **Taylor-Wheeler Commercial, Inc.,** 420 Safford St., Fresno—$140,000 for eight classroom school bldg., Weaver Grammar School, Merced — by Elementary School District, Merced. 11-28

MONTEREY CO.—**Talcott Lumber Co.,** 312 E. Alisal St., Salinas — $300,000 for store bldg., S. Main St., Valley Center Business Development, Salinas—by F. W. Woolworth Co., San Francisco. 11-12

RIVERSIDE CO. — **R. J. Daum,** 6803 West Blvd., Inglewood—$256,817 for general work on one-story and basement, reinf. conc. and frame insecticide lab. bldg., University of California, Riverside—by Regents of University of California, Los Angeles. 11-21

SACRAMENTO CO.—**Continental Construction Co.,** 1402 Front St., Sacramento—$123,875 for addition to school bldg., 2970 Riverside Blvd., Sacramento—by Board of Education, Sacramento. 11-5

SAN BERNARDINO CO.—**Peter Kiewit Sons' Co.,** 345 Kieways Ave., Arcadia—$346,800 for general constr. of four (4) one-story, reinf. conc. dormitory bldgs., California Institution for Men, Chino—by Division of Architecture, Sacramento. 11-19

SAN DIEGO CO.—**H. H. Peterson,** 3340 Harasthay St., San Diego—$140,000 for one-story telephone bldg. addition at 3704 Tennyson St., San Diego—by Pacific Telephone & Telegraph Co., San Diego. 11-12

SAN FRANCISCO CO. — **MacDonald, Young & Nelson,** 351 California St., San Francisco—will build a reinf. conc., 5-story substation at Mission and Eighth Sts., San Francisco—by Pacific Gas & Electric Co., San Francisco. 11-18

SAN JOAQUIN CO.—**George Roek,** Box 783, Stockton — $266,662 for temporary classroom bldgs., junior college, North Pacific Ave., Stockton—by City Unified School District, Stockton. 11-28

SAN MATEO CO.—**Carrico & Gautier,** 365 Ocean Ave., San Francisco—$111,633 for two-story, frame and stucco convent bldg. addition, Redwood City—by Board of Directors, Our Lady of Mt. Carmel, Redwood City. 11-19

SAN MATEO CO.—**Moore & Roberts,** 693 Mission St., San Francisco—$135,000 for reinf. conc. one-story school bldg. addition, St. Mathew's School, San Mateo—by Roman Catholic Archbishop, San Francisco. 11-20

SANTA CLARA CO.—**O. E. Anderson,** 398 Menker Ave., San Jose—$140,853 for wood frame and reinf. conc. one and part

two-story market bldg., 4th and Younger Sts., San Jose—by Dick's Super Market, San Jose. 11-12

SANTA CLARA CO. — **Nichols-White, Inc.,** 145 Addison St., Palo Alto—$110,000 for 150 x 140-ft. manufacturing plant, Palo Alto—by Hewlett-Packard Co., Palo Alto. 11-4

SANTA CLARA CO. — **Remmet Construction Co.,** 131 University Ave., Palo Alto—$300,000 for one-story, struct. steel helicopter factory bldg., 1350 Willow Road, Palo Alto—by United Helicopters, Inc., Palo Alto. 11-1

SANTA CLARA CO.—**Carl N. Swenson,** Box 558, San Jose—$234,999 for two frame and stucco school bldgs., Barron Ave. and Dana St., Palo Alto—by Palo Alto Unified School District, Palo Alto. 11-12

SOLANO CO. — **R. C. Briggs,** 391 29th Ave., San Francisco—$1,640,000 for 180, two and three bedroom dwellings, near Fairfield—by Charles Cournale, Vallejo. 11-1

TULARE CO.—**Ralph E. Suess,** 1320 N. Court, Visalia—$100,000 for frame and stucco gothic type church on S. Conyer and Tulare Aves., Visalia—by Pastor of Grace Lutheran Church, Visalia. 11-1

Colorado

EL PASO CO. — **Raymond Whitlock,** Colorado Springs—$537,848 for one and two story grade school bldg., Colorado Springs—by Board of Education, Colorado Springs. 11-1

MESA CO.—**Otto J. Bauman,** 1602 Orchard Ave., Grand Junction—$250,000 for women's dormitory bldg., junior college campus, Grand Junction — by Board of Directors, Mesa County Junior College, Grand Junction. 11-12

Idaho

ADA CO.—**C. B. Lauch Construction Co.,** Box 2559, Boise—$200,000 for a 200-unit apartment bldg., Boise—by J. R. Simplot, Boise. 11-7

POWER CO. — **Chalmers & Borton,** Hutchinson, Kans.—$125,000 for grain elevator in American Falls—by Power County Grain Growers Co-op, American Falls. 11-7

Montana

MISSOULA CO.—**Askevold Construction Co.,** Missoula—$243,000 for completion of 92 housing units at university in Missoula — by State Architecture Commission, Helena. 11-1

Nevada

WASHOE CO. — **Boudwin Construction Co.,** 311 N. Park St., Reno—$347,791 for ground floor, L shaped wing addition to hospital bldg., and constr. of fully equipped boiler room, Reno—by Washoe County Hospital Directors, Reno. 11-8

New Mexico

SANTA FE CO.—**Robert E. McKee,** 4700 San Fernando Rd., West, Los Angeles—$2,162,865 for Atomic Energy facilities at Los Alamos—by U. S. Atomic Energy Commission, Santa Fe. 11-14

North Dakota

McLEAN CO.—**Peter Kiewit Sons' Co.,** Omaha National Bank Bldg., Omaha, Neb., and **Morrison-Knudsen Co., Inc.,** Box 450, Boise, Idaho—$6,796,213 for construction of stage 2 of Riverdale, Garrison dam construction town—by Corps of Engineers, Bismarck. 11-1

Oregon

MALHEUR CO.—**Intermountain Builders,** Caldwell, Idaho—$100,000 for brick building for newspaper, Ontario—by Ontario Argus-Observer, Ontario. 11-1

MULTNOMAH CO.—**Donald M. Drake,** Lewis Bldg., Portland — $641,000 general contract for constr. of elementary school bldg., Creston—by School District No. 1, Portland. 11-1

MULTNOMAH CO.—**Ross B. Hammond Co.,** 1241 N. Williams Ave., Portland—$365,000 for heavy warehouse bldg., 2400 S.W. Water St. block, Portland—by Rudie Welhelm Warehouse Co., Portland. 11-5

MULTNOMAH CO. — **Reimers & Jolivette,** Railway Exchange Bldg., Portland—$166,164 for remodeling of office bldg., Lincoln Bldg., Portland—by Veterans Administration, Portland. 11-21

Utah

SALT LAKE CO. — **Jacobsen Construction Co.,** 724 S. 3rd East, Salt Lake City—$100,000 to improve and remodel Bamberger Depot Bldg., corner of South Temple and West Temple Sts., Salt Lake City—by Overland Greyhound Lines, Salt Lake City. 11-21

WEBER CO.—**Campion Co.,** 1550 Capitol

St., Ogden—$144,446 for warehouse and retail store bldg. in Ogden—by W. P. Fuller & Co., Ogden. 11-7

WEBER CO.—**James Leck Co.,** 211 S. 11th St., Minneapolis, Minn.—$130,000 for a 150 x 221-ft. storage battery mfg. bldg. on 28th Ave., betw. Wall and Reeves Aves., Ogden—by Solar Corp., Ogden. 11-21

Washington

KING CO. — **Kuney-Johnson Co.,** 235 Ninth Ave., N., Seattle—$449,500 general contract for reinf. conc., two-story auto sales and garage bldg. at Ninth Ave. and Leonara St., Seattle—by S. L. Savidge, Inc., Seattle. 11-1

KING CO.—**A. F. Mowatt Construction Co.,** 2833 Eastlake Ave., Seattle—$204,124 for two-story, reinf. conc. warehouse and office bldg., Seattle—by Puget Sound News Co., Seattle. 11-5

SPOKANE CO.—**Hazen & Clark,** N. 1101 Howard St., Spokane—$400,000 for 44-unit, one and two-bedroom apartment bldgs., Park Arms and Westwood Arms, betw. Spruce and Poplar Sts., West of Coeur d'Alene Park, Spokane—by Richard W. Ginn, Spokane. 11-4

Canada

BRITISH COLUMBIA — **Dawson & Hall, Ltd.,** 775 Clark Dr., Vancouver — $239,935 for courthouse bldg. at Penticton —by Provincial Government, Vancouver. 11-1

BRITISH COLUMBIA—**Dominion Construction Co., Ltd.,** 1901 Granville St., Vancouver — $75,000 for one-story and basement school bldg. at Oak St. and 27th Ave., Vancouver—by Board of Directors of Talmud Toroh Hebrew School, Vancouver. 11-1

BRITISH COLUMBIA — **James Hyslop & Son,** Columbia St., Vancouver—$200,000 general contract for new sub-station for railway company, New Westminster—by B. C .Electric Railway Co., Vancouver. 11-1

Foreign

TURKEY—**Western-Knapp Engineering Co.,** Division of Western Machinery Co., 748 W. Eighth South St., Salt Lake City, Utah—$1,500,000 for two large ore-dressing plants in Turkey—by Republic of Turkey.

Miscellaneous . . .

California

KERN CO.—**Alta Construction Co.,** 544 Market St., San Francisco—$381,494 for swimming pool, shop bldg. and community bldg., Lakeside Elementary School, Bakersfield—by Board of Education, Bakersfield. 11-3

SAN FRANCISCO CO. — **Pacific Coast Engineering Co., Inc.,** Drawer E, Alameda —$129,700 for two 300-cu. yd. capacity welded steel dump scows, San Francisco—by Board of State Harbor Commissioners, San Francisco. 11-14

North Dakota

McLEAN CO.—**S. J. Groves & Sons Co.,** Wesley Temple Bldg., Minneapolis, Minn. —$360,512 for 8 mi. of spur railroad track, Riverdale to Garrison Dam — by Corps of Engineers, Bismarck. 11-7

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

M. E. Army, veteran employee of the LIMA SHOVEL AND CRANE DIVISION of LIMA-HAMILTON CORP., Lima, Ohio, died suddenly at his home in Glendale, Calif., recently. "Mick", as he was known to his many friends, joined the Lima-Hamilton organization in 1928 as service engineer, later becoming sales and service engineer, and then assistant district manager, the position he held at the time of his death.

☆ ☆ ☆

Three appointments to the post of manager of sales have been made within the organization of the COLUMBIA STEEL CO., United States Steel subsidiary. **Ralph Winship** is now manager of sales for the Washington Division with offices in Seattle. **B. W. Mitchell** now has the same position for the Oregon Division with offices in Portland. **Andrew Carrigan** is new manager of sales for the Central Division which has its headquarters in San Francisco.

☆ ☆ ☆

Plans are under way for the construction at Anderson, Calif. near Redding of a huge ponderosa and sugar pine plywood plant, according to **Lawrence Ottinger,** president of the UNITED STATES PLYWOOD CORP. The plant, including a small sawmill is a joint venture of the United States Plywood and HARBOR PLYWOOD CORP. These concerns have acquired more than one billion ft. of timber covering 60,000 acres in the Anderson area of Shasta Co. The new plant will employ 300 persons.

☆ ☆ ☆

Walter D. Jones, veteran technical director of W. P. FULLER & CO., San Francisco, retired from active duty recently after 40 years of service with the Western paint, glass and wallpaper firm. Jones was active in both the sales and technical divisions of the business. He had been technical director in charge of all the Fuller laboratories since 1935. **A. P. Pahl,** formerly manager of the South San Francisco laboratories, succeeds Jones as technical director.

☆ ☆ ☆

Through error in a news release from the KOEHRING CO., Milwaukee, Wis., it was erroneously reported in the October Trade Winds that BAY CITIES EQUIPMENT, INC., Oakland, would be distributor for the Johnson concrete plants, roadbuilders' bins and batches and clamshell buckets. This is incorrect in that Bay Cities has the contract on the clamshell buckets only. Edward R. Bacon Co., San Francisco, is the distributor for the rest of the Johnson line.

☆ ☆ ☆

Two announced personnel changes for the Pacific Coast operation of the WHITE MOTOR CO., Cleveland, Ohio, are of **Tom N. Grizzell,** credit manager of the Los Angeles Branch, as business manager of the same unit, and of the transfer of **Joe C. Knapp,** business manager of the Los Angeles branch, to the San Francisco branch as salesman. Knapp's promotion is the result of 25 years of service with White in many capacities. It was announced simultaneously that **Jack Lambrecht** and

KNAPP **GRIZZELL**

Bill Crawford of the San Francisco sales department have purchased the interests of the Henwood Motor Co. of San Jose and been appointed White distributor for that area. The newly formed company will be known as the C & L MOTOR CO.

☆ ☆ ☆

THE GOLDEN STATE EQUIPMENT CO. of Los Angeles, Calif., are the recipients of a plaque awarded by the WORTHINGTON-RANSOME CONSTRUCTION EQUIPMENT DIVISION of the WORTHINGTON PUMP AND MACHINERY CORP., Holyoke, Mass., for the distributor making the largest dollar volume of annual sales in the company's line of Blue Brute equipment. Golden State had been a Blue Brute distributor for only one year when it won the competition. **Mark Gay** and **Walter McGonigle** are president and vice-president respectively of the equipment company. **R. E. Rodenhuis,** Western region manager for the Worthington Co., made the award.

☆ ☆ ☆

SECURITY VALVE CO. of Los Angeles has appointed **Samuel H. Skofield,** 340 Kearny St., San Francisco, as representative for the sale of their Sentinel Valves. Sentinels are special, earthquake-actuated valves that shut off gas supply lines whenever serious earth disturbances occur in their vicinity.

☆ ☆ ☆

R. H. Bell has been named as superintendent of the Bolt and Nut Department of the South San Francisco Plant of BETHLEHEM PACIFIC COAST STEEL CORP. Bell has worked at the plant for ten years and was assistant superintendent before this promotion. He succeeds **John M. Stetter** who died recently.

☆ ☆ ☆

BAY EQUIPMENT CO. in Richmond, Calif., is now distributor headquarters for the Blue Brute line of construction equip-

ment in northern California. The company was organized last year by partners **R. W. Christofferson** and **R. D. Smith**, who have both spent a number of years in the construction field and a period selling construction equipment. Blue Brute equipment is manufactured by the WORTHINGTON-RANSOME CONSTRUCTION EQUIPMENT DIVISION of the WORTHINGTON PUMP AND MACHINERY CORP., Holyoke, Mass.

☆ ☆ ☆

B. A. Schimmel was recently appointed sales manager of the WOOD MANUFACTURING CO., North Hollywood, Calif. According to word from **Clyde W. Wood**, President, Schimmel will apply twenty years of selling experience to the line of Wood Roadmixers and specialized road-building equipment. Schimmel replaces **DeWitt Page** who was sales manager of Wood for many years, and who has left to assume a position in the East.

☆ ☆ ☆

AMERICAN POTASH & CHEMICAL CORP. has announced completion of the first phase of its postwar expansion program. The company, which extracts various chemicals from the brine in Searles Lake in the California desert, plans to spend $7,000,000 by the end of 1948, including a $4,500,000 soda ash and borax plant and a $2,000,000 power plant expansion. Recently completed was a research laboratory, a modern office building in Los Angeles, and a subdivision of 47 homes near the Searles Lake plant.

☆ ☆ ☆

INTERMOUNTAIN

The TIMKEN ROLLER BEARING CO., Canton, Ohio, has purchased the 8-ac. site and taken over all construction on the new $150,000 rock bit plant at Colorado Springs, Colo. The plant was originally scheduled to be built by the Colorado Springs Chamber of Commerce and leased to the company but it was later decided that the company would build the plant. It was announced simultaneously that **Frank M. Givin**, general foreman of the company's Mount Vernon, Ohio, plant, was named manager of the new unit. Final construction work, installation of machinery and getting the plant into production is under the advisory supervision of **William A. Fowler**, general manager of the Columbus, Ohio, plant.

☆ ☆ ☆

Cornelius L. Sarosdy has been appointed by the BLAW-KNOX CO., Pittsburgh, Pa., as sales engineer for construction equipment in the area covering Texas, Oklahoma, and New Mexico. He will have his headquarters in Dallas, Tex.

☆ ☆ ☆

Two changes in branch management personnel are announced by the FRUEHAUF TRAILER CO. of California. **Alan Tice**, formerly branch manager at El Paso has been transferred to Phoenix as manager and made supervisor for the Phoenix, Albuquerque, El Paso district. **V. E. Hensley** has been appointed as branch manager at El Paso to replace Tice. Hensley joined Fruehauf at Denver in 1935 and later became assistant branch manager at El Paso.

☆ ☆ ☆

HAGAN CORP., Pittsburgh, Pa., has appointed the MAINTENANCE ENGINEERING CORP., Houston, Texas, to represent the firm in Mexico in order that resident service in the combustion and chemical engineering fields will be available. Maintenance Corp. in turn has estab-

lished offices at Mexico, D. F., and appointed **Ing. Guillermo Almazan** as its resident engineer.

☆ ☆ ☆

PACIFIC NORTHWEST

In a move to centralize its combustion control and water-conditioning services to industry in Oregon, HAGAN CORP., Pittsburgh, Pa., has appointed the UNITED ENGINEERING CO., Portland, as Oregon representative for all Hagan engineering services and products, and those of its associated companies, Hall Laboratories, Calgon, Inc., and the Buromin Co. The NORTHWEST FILTER CO., Seattle, will continue to represent Hagan Corp. and associated companies in the state of Washington.

☆ ☆ ☆

Two appointments have been announced within the organization of the HYSTER CO., Portland, Ore., manufacturers of industrial trucks and tractor-mounted construction equipment. **Arthur Nikand** is the new factory manager of the Portland plant. He had been assistant factory manager for a year, and foreman of hoist equipment assembly prior to becoming factory manager. **George Lichty** has been named as district manager in the Western Industrial Truck Division. Lichty has been a sales engineer in the San Francisco office of the company for three years and will now make his headquarters in the Portland office. He joined the Hyster Co. in 1941 after several years experience in the automotive business.

NIKAND LICHTY

☆ ☆ ☆

AMONG THE MANUFACTURERS

The Joseph A. Holmes medal of honor was awarded recently to **A. J. R. Curtis,** safety director of the PORTLAND CEMENT ASSN., Chicago, for his contributions to safety in the cement industry. The medal was presented by **Dan Harrington,** secretary of the Joseph A. Holmes Association, at the closing session of the annual meeting of the Portland association in Chicago. Curtis is only the second individual to receive this medal, although 139 mills have received it in the past. He has been responsible for numerous innovations promoting safety in cement mills and quarries.

☆ ☆ ☆

Frank T. Lewis has been appointed assistant manager of GENERAL ELECTRIC COMPANY's Schenectady Works. Lewis was formerly assistant to the Works manager with particular attention to the transmitter manufacturing divisions at the Schenectady and Syracuse plants in New York, and prior to that, production manager of the West Lynn Works. He has been with General Electric since 1916.

☆ ☆ ☆

C. F. Winchester, construction equipment manufacturer's representative, has announced the removal of his office from 1928 Eye St., N. W., to the Denrike Bldg., 1010 Vermont Ave., N. W., Washington, D. C. Winchester, who has been in the Washington, D. C., area since 1927, is well known in government circles and is making arrangements with a large number of foreign distributors to handle his clients' products.

☆ ☆ ☆

The TIMKEN ROLLER BEARING CO., Canton, Ohio, has announced the transfer of **William E. Bryden,** sales engineer, from the Chicago office to the Cincinnati office of the Timken Steel and Tube Division. Bryden joined the Timken organization in 1937 as an assistant in the metallurgical department. He will be succeeded at Chicago by **William T. Strickland,** sales engineer.

☆ ☆ ☆

LIMA LOCOMOTIVE WORKS, INC., Lima, Ohio, and GENERAL MACHINERY CORP., Hamilton, Ohio, two of the country's oldest manufacturing concerns in the heavy equipment industry, recently merged forming the LIMA-HAMILTON CORP. The action will give the Lima-Hamilton Corp. a diversified line of products formerly manufactured under separate management. **Samuel G. Allen** and **John S. Dixon,** former Board Chairman and

President of Lima respectively, occupy the same positions in the new corporation. **George A. Rentschler,** former Board Chairman of General Machinery Corp., assumes the position of Chairman of the Executive Committee.

☆ ☆ ☆

Cornell University has announced the establishment of an endowed professorship of metallurgical engineering named for **Francis Norwood Bard,** owner of the BARCO MANUFACTURING CO. of Chicago, Ill. Bard made the formal presentation of a $250,000 fund to endow the professorship at a dinner held recently in his honor at the University. Professor Peter E. Kyle will be the first occupant of the chair and will head a broadened program in metallurgical engineering already organized at Cornell.

☆ ☆ ☆

CHARLES D'W. GIBSON

Charles D'W. Gibson and **John A. Hill,** vice-presidents of AIR REDUCTION CO., INC., New York City, have been elected as directors of the company. Gibson had been vice-president in charge of sales since 1937. Hill, formerly secretary of the company, was made vice-president in 1945.

JOHN A. HILL

☆ ☆ ☆

Clifford L. Vader has been appointed as assistant general sales manager of DIAMOND IRON WORKS, Minneapolis, Minn. Vader entered the Diamond sales department in 1942 following several years of partnership in the sewer, water and

bridge-building firm of Theodore Jensen Co., where he acted as superintendent of roadbuilding and heavy construction projects throughout the Northwest.

☆ ☆ ☆

R. Louis Towne has been appointed as sales promotion manager for RHEEM MANUFACTURING CO., and will make his headquarters at the company offices in New York City. Towne comes to Rheem from the Eastern Industries, Inc., of West Newton, Mass., where he was sales manager of the pump division.

☆ ☆ ☆

Irving S. Olds, Chairman, UNITED STATES STEEL CORP., New York City, announces that the Directors have declared a quarterly dividend of $1.75 per share on the preferred stock, payable Nov. 20, 1947, and a dividend of $1.25 per share on the common stock, together with a special dividend of .75 per share on the common stock, both payable Dec. 10, 1947. Income for the third quarter of 1947, before declaration of dividends, is reported as $28,735,082.

☆ ☆ ☆

Ben Moreell, chairman of the board and president of the JONES & LAUGHLIN STEEL CORP., has announced full details of a plant improvement program for the corporation now under way entailing the investment of $100,000,000. A letter to the corporation's shareholders and employees explained that the program involves the sale of $60,000,000 first mortgage bonds. The program covers all departments and should be near completion by the end of 1949. Construction of new mills, additional boiler and power plants, and modernization of plant facilities are part of the long range program.

☆ ☆ ☆

C. S. Conrad has been appointed as general manager of sales for COLUMBIA STEEL CO., subsidiary of United States Steel Corp. Three other sales executive appointments have also been announced. These are of **W. B. Sawyer, Jr.,** as assistant general manager of sales for administration, **Eric Barnett,** assistant general manager of sales for distribution, and **C. L. Hamman** as general sales staff manager. **E. W. Long,** Claims Bureau chief for the company, has retired after thirty-nine years of service with subsidiaries of United States Steel Corp.

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.

Truck Mixer

Manufacturer: Blaw-Knox Co., Pittsburgh, Pa.

Equipment: Mixer of high-discharge type.

Features claimed: Unique feature of the new mixer is a revolving hopper for both charging and discharge. The hopper is supported directly from the end of the mixing drum cone and moves with the drum as the truck frame weaves under field operating conditions. Thus, the hopper remains in alignment with the drum and avoids any eccentric grinding action. This integrated design assures a tight and enduring seal between hopper and drum, preventing the leakage of grout and reducing maintenance costs. The new unit will do a thorough job of mixing and uniform mix from beginning to end of the batch, will discharge rapidly without segregation and will satisfactorily discharge low slump concrete. The mixers are made in standard sizes of 2, 3 and 4½ cu. yd.

Concrete Mixer

Manufacturer: T. L. Smith Co., Milwaukee, Wis.

Equipment: Portable 1-bag concrete mixer.

Features claimed: The machine is designed for speed both on the job and enroute to the job. Balanced, lightweight construction, with low center of gravity and auto-type leaf springs combine to assure smooth towing at even high speeds. The mixer has an accurate, easy-to-reach water measuring tank, automatic high frequency skip vibrator, enclosed gear reduction unit, and levers centralized for convenient operation.

Root Rake

Manufacturer: Florida Land Clearing Equipment Co., Jacksonville, Fla.

Distributor: Caterpillar Tractor Co., Peoria, Ill.

Equipment: Rake to dispose of top growth and roots in one operation.

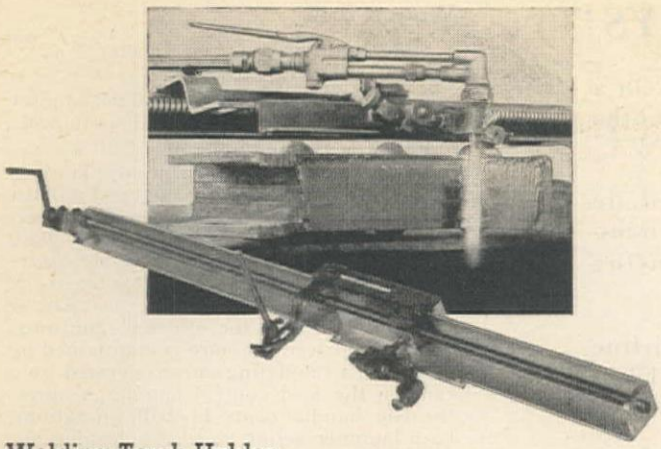
Features claimed: The detachable rake, manufactured in sizes to match the D6, D7 and D8 track-type tractors, has a basic frame consisting of a heavy steel angle iron across the top of the rake and a heavy steel boxed section at the center with brackets attached to fit bulldozer arms or "C" frame. Alloy steel cast teeth are bolted to the basic frame with the flanges of the teeth contacting each other, giving rigidity to the teeth and adding strength to the center boxed section of the frame. Teeth are interchangeable. Tooth points can be lowered 16 in. into the ground to rake out roots. The front of the tooth is curved in such a way as to give brush a rolling action which shakes soil loose and permits the soil to sift through the openings between the teeth.

Tail Gate Loader

Manufacturer: Day Co., Chicago, Ill.

Equipment: Hydraulic tail gate loader for trucks.

Features claimed: The unit fits most standard 1½-ton trucks, is furnished in a complete package, and takes only a few minutes to install. The lift platform operates over the full distance from ground to truck floor level, raising and lowering loads up to 1200 lb. The platform remains level throughout its entire arc, and swings up to serve as a tail gate when the truck is on the road. The loader is operated by a hydraulic pump driven from the truck's standard power take-off and is controlled by a convenient lever, or the pump can be operated with a hand lever.



Welding Torch Holder

Manufacturer: J. A. Campbell Co., Long Beach, Calif.

Equipment: Portable device to hold and feed torch.

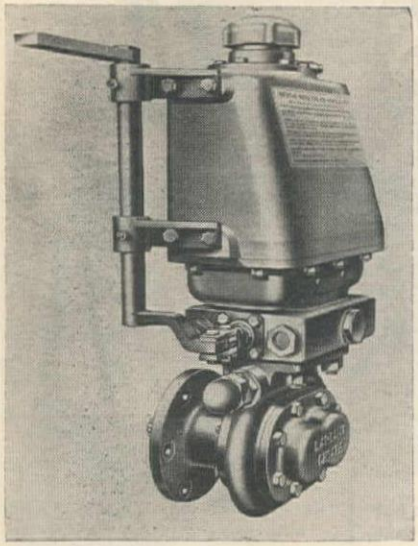
Features claimed: The portable, screw feed device holds the torch and feeds it along a straight line. By turning a simple geared crank at the end, the torch travels along a pre-determined line and cuts through the metal as true as if lathe-cut. Grinding and milling of the torch-cut edges are unnecessary except for precision finishes. The holder will hold any torch, has an adjustable holder so the torch can be angled to cut bevel or scarf, and has a positive feed so that the operator can direct the torch along a straight line as slow or fast as desired. The torch can be instantly released. The unit is 5 ft. in length and weighs 42 lb.

Hydraulic Products

Manufacturer: LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

Equipment: New line of hydraulic pumps and motors.

Features claimed: The pumps are designed for automotive, portable or stationary installations. The power unit incorporates some revolutionary principles such



as surge control, a super-charged pump and small capacity reservoir. A compact 3-in-1 power unit has been developed which combines in one design a pump, control valve and reservoir. Additional design features of the new motors and pumps are the interchangeable spur-type gears, needle roller bearings, positive lubrication, and bronze reversible thrust plates.

Industrial Ladder

Manufacturer: Duo Safety Ladder Corp., Oshkosh, Wis.

Equipment: Light-weight aluminum ladder.

Features claimed: The light weight of the all-aluminum ladders plus their indestructible construction makes them ideal for both fire company and industrial use. The ladder, called Channel Rail by the manufacturer, has expanded rungs electrically welded to an outside channel and with a double rolled head internally expanded on both sides of rung plate to prevent spreading, and non-shearing rivets. They are manufactured in a variety of lengths and models. The new aluminum step ladders utilizing this exclusive design should bring added safety and strength to the use of fire and industrial ladders. Light weight and durability are gained by manufacturing the ladders from Duralumin, an aluminum alloy which contains approximately 4 per cent copper and fractional percentages of other metals. The variety of lengths and models adapt the ladders for varied use.

Wagon Drill

Manufacturer: Gardner-Denver Co., Quincy, Ill.

Equipment: New wagon drill with motor feed operated by a 5-cyl. radial air motor.

Features claimed: The new drill assures high speed performance in any kind of ground. It has a 3-wheel Universal mounting with motor feed for six-foot steel changes, and the air motor drives a chain attached to a heavy mounting slide carrying the drill. An outstanding feature of the drill is its ease of control. The feed can be instantly reversed for effective churning. The correct feed pressure is maintained by means of a regulating valve operated by a cam on the feed control handle. A single throttle handle controls drill operations, both hammer action and hole-cleaning air. The U-bar of the drill is adjustable from a position slightly above horizontal through an arc of 90 deg. to vertical.

Self-propelled Crane

Manufacturer: Thew Shovel Co., Lorain, Ohio.

Equipment: Crane with between-jobs mobility.

Features claimed: Dual control, a feature which may be installed on any Lorain Model TL-20 mounted on a standard rubber-tired Moto-Crane carrier, utilizes the carrier engine and automotive propelling and steering mechanism for traveling to the job at speeds up to 33 m.p.h. Once at the scene, the machine can be converted into a self-propelled unit within five minutes with on-the-job travel of 1 to 7 m.p.h. powered by the turntable engine only. All steering and brake controls are located conveniently at the operator's position in the

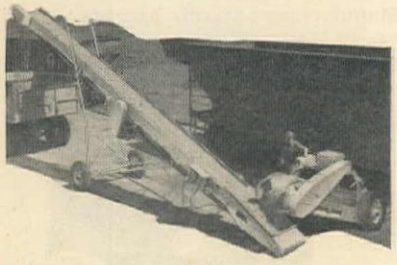
turntable cab. Steering is controlled by air power. When the job has been completed, a five-minute adjustment re-converts the machine to a highly mobile unit ready for highway and off-the-road travel.

Unloader and Stockpiler

Manufacturer: Barber-Greene Co., Aurora, Ill.

Equipment: Two heavy-duty units which act as a team.

Features claimed: The units facilitate the unloading of stone, sand, gravel and all bulk materials from hopper cars. The new type car unloader has a capacity range of up to three tons per minute operating in pits or above rails. Chain and belt on the



conveyor are riveted by means of steel attachments and cleats so that power is transmitted to give positive belt movement at all times without jam-ups. The unloader has a convenient towing hitch, pneumatic tires and shock absorbers for highway towing, and anti-friction bearings throughout. The stockpiler-loader eliminates trouble due to chain and sprocket drive through use of V-belt drive, two precision gear reducers and a shaft drive to the head pulley. Simple swiveling wheels make it flexible for all types of unloading and stockpiling service. It is equipped with a handy towing hitch.

Bottom Dump Trailers

Manufacturer: Olson Manufacturing Co., Boise, Ida.

Equipment: High-speed trailers for on or off highway use.

Features claimed: The trailers have vertical sides with load resting on bottom doors to assure fast, clean dumping. Doors are raised and lowered from truck cab with hydraulic controls to permit windrowing. Air-operated mechanical pin locks doors to prevent accidental dropping due to mechanical failure. Segmented tubular hinge arrangement compensates for body flexing and prevents leakage of sand or other finely divided material. Six models ranging from 15 to 50 cu. yd. in capacity are offered and buyer has choice of single axle with spring suspension, tandem spring suspension or walking beam tandem.

Semi-portable Aggregate Plant

Manufacturer: Pioneer Engineering Works, Minneapolis, Minn.

Equipment: Crushing and screening plant suitable for the small quarry.

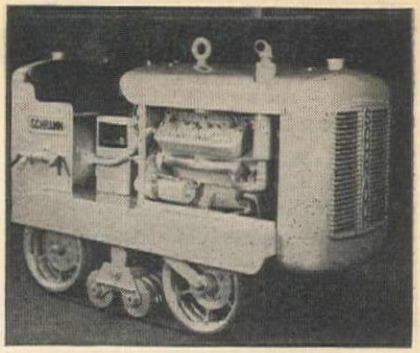
Features claimed: The compact hopper-fed plant consists of a jaw crusher, bucket elevator and transfer conveyor all mounted on a four wheel trailer with multiple V-belt drive from power unit to jaw crusher, drive from crusher to elevator and revolving screen, and the necessary hoppers and spouts. The revolving screen is a complete unit easily mounted on either steel or wood bin. Capacity of the plant using the standard 1016 size jaw crusher is 10 to 15 tons per hour. The size 1024 crusher is also available. The plant produces two sizes of aggregate and sand. In transit, bucket elevator folds over truck, reducing travel height to 11 ft. 6 in. Weight of the plant is approximately 26,000 lb.

Crawler Tractor

Manufacturer: Schramm Inc., West Chester, Penn.

Equipment: Crawler for railroad maintenance work.

Features claimed: The crawler travels fast or slow, reaching speeds of 20 m.p.h. It pulls or pushes, and will climb any hill on which the surface does not slide. The tracks are rubber, heavily reinforced with steel wire. Steering is by hydraulic brakes on the driving wheels. It is offered to the



railroads for almost anything that is needed in maintenance of way or building and bridge maintenance, and negotiates mud and snow with ease.

Construction Equipment Maintenance

THE FOLLOWING items have been specially selected from recent new equipment announcements as being of interest to Master Mechanic and shop personnel of construction contracting firms.

Cummins Service Kits

Manufacturer: Cummins Engine Co., Inc., Columbus, Ind.

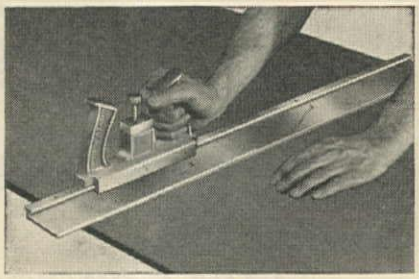
Equipment: Service parts kits.

Features claimed: A new and complete line of 31 service parts kits containing all the genuine Cummins parts needed to overhaul a specific sub-assembly unit of the Cummins Diesel engine. Conveniently packaged and easily stored, the kits will help mechanics complete their overhauls easier and faster and result in savings of money since the price of the kit is less than the cost of the parts purchased individually. Contents of each kit have been determined by the experience of mechanics in the field.

Belt Cutter

Manufacturer: Flexible Steel Lacing Co., Chicago, Ill.

Equipment: Cutter for heavy conveyor and transmission belts.

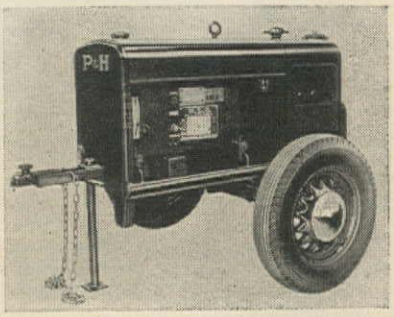


Features claimed: The new cutter makes it a simple job to cut belts up to 60 in. wide and 1⅜ in. thick. To use the cutter as shown in the illustration, all that is necessary to do is to square the base up with the center line of the belt. The base is then nailed to the belt and the cutter is pushed across the belt. Each cut is made about ⅛ in. deep and the screw is then turned to lower the blade another ⅛ in. With several rapid cuts a belt can be cleanly and squarely cut.

Portable Welder

Manufacturer: Harnischfeger Corp., Milwaukee, Wis.

Equipment: Arc welder with extra power supply.



Features claimed: The extra power supply, offered as optional equipment at small extra cost, provides 1½ kw. of AC. current

at 115 v., single phase. It enables operators to hook up electric lights for floodlighting while welding and permits the use of electric powered tools. Any universal AC-DC portable tool may be operated from this additional power source. The P&H WN-200 Welder having this feature is available as a trailer or stationary model and has a welding service range of from 30 to 260 amps. This welder has one control for any desired welding heat, from minimum to maximum capacity.

Welding Apparatus Case

Manufacturer: Air Reduction Sales Co., New York, N. Y.

Equipment: Compact carrying case for transporting welding outfit to the job.

Features claimed: Torch, tips, regulators, hose, gloves, goggles, wrenches, and miscellaneous equipment can all be compactly

arranged in this new case. Construction is of cold rolled steel with flush double lock seams and ripple exterior finish of baked enamel. It is supplied with a handle-equipped lift-off tray and heavy duty bolt catches. The case has a net weight of slightly more than 10 lb.

Radial Saw

Manufacturer: DeWalt, Inc., Lancaster, Penn.

Equipment: Improved model for miter, rip and bevel cutting.

Features claimed: The new model combines the functions of many machines and is designed for safety, accuracy and ease of operation. An easily visible, single degree, calibrated scale is provided for all-purpose cutting. Simple mechanism alignment adjustments are provided to maintain the accuracy of every setting. A safety feature for ripping is a new kickback device featuring multiple dogs which can be put into operation with a simple flick of the wrist. Start-stop switch control is deeply recessed on front end of machine arm as another safety feature. The wide work table provides ample working space for easier handling of materials or in set-ups for "gang" cutting operations.

Air Starter

Manufacturer: Chicago Pneumatic Tool Co., New York, N. Y.

Equipment: Air motor for starting Diesels.

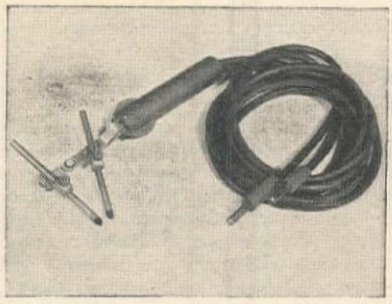
Features claimed: The starter is a 7 h.p. motor with a Bendix starting drive. A unit 18 in. long and 5½ in. in diameter, it is mounted on any Diesel by means of a standard flange. The starter makes use of the compressed air power nearly always available on road jobs, and eliminates the need for electric batteries or gas engine units. It easily handles Diesels of up to 600 cu. in. displacement.

Arc Torch

Manufacturer: Westinghouse Elec. Corp., Pittsburgh, Pa.

Equipment: Carbon arc torch.

Features claimed: Especially designed



for brazing, soldering, supplying heat for light forging and preheating before welding, each torch comes complete with two 10-ft. extra flexible welding cable leads attached, the leads being equipped with bayonet attachment plugs to fit Westinghouse input welders. Also furnished are one pair of ¼ by 6-in. carbon electrodes and one pair of ⅜ by 6-in. carbon electrodes.

Overlays on Copper

Manufacturer: Eutectic Welding Alloys Corp., New York, N. Y.

Equipment: Gas welding rod for use on copper.

Features claimed: Deposits of beryllium copper followed by heat treating are no longer required to produce maximum overlay hardness on copper, because "Eutec-

Rod" 188 will produce overlays of extreme hardness in a single pass on copper. The new alloy has a bonding temperature of 1,800 deg. F., and remelts at 1,950 deg. F. It applies equally well to steel and ferrous metals with no dilution of the base metal during welding. It is characterized by high resistance from corrosion and acids.

Automatic Rip Saw Feed

Manufacturer: Electric Saw and Tool Co., San Francisco, Calif.

Equipment: Device to clamp to rear of radial saw table.

Features claimed: The rip saw feed, clamped to the rear of the radial saw table, makes one unit and does not interfere with normal operation of the saw. To rip, the radial arm is swung 180 deg. over feed table and lumber can be fed four times as fast as by hand. The operator can lay lumber on the extension conveyor table and while lumber is being fed automatically, get the next piece ready. The feed can handle lumber up to 6 in. thick.

Steel Tire

Manufacturer: UnitedStates Rubber Co., Los Angeles, Calif.

Equipment: Steel cord fabric tire.

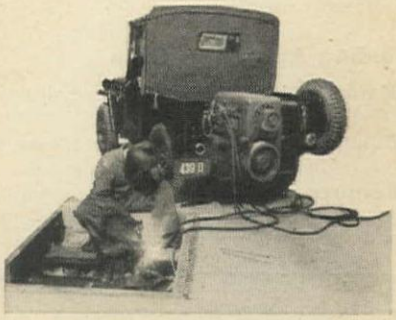
Features claimed: The new tire is the result of six years of development and research. It is designed only for use on heavy trucks and aircraft. Tests on truck fleets have proved the tire with steel cord fabric is more resistant to blowouts, while the use of fewer plies results in a cooler running carcass through quicker dissipation of heat. Because of steel's superior resistance, a slower rate of tread wear can be expected.

Jeep Mounted Welder

Manufacturer: Harnischfeger Corp., Milwaukee, Wis.

Equipment: Welding generator coupled to rear power take-off.

Features claimed: Pulleys of the proper ratio permit the Jeep engine to operate at approximately 1500 r.p.m. This speed enables the arc welding generator to operate



at peak efficiency over its welding range. V-belts are used in the hookup. The generator is mounted for easy removal, making it quick to replace the generator with an air compressor as the need requires. The front of the Jeep is left free for driver and passenger.

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.

LIFT TRUCKS AND CRANES — **Hyster Company** of Portland, Ore., has sent off the press a condensed lift truck catalog which describes, pictures and lists specifications on the complete line of Hyster lift trucks, straddle trucks, and mobile cranes, all specially designed for operation on pneumatic tires. All of the trucks are powered by gas engines and vary in capacity from 2,000-lb. lift to 30,000-lb. lift.

EXCAVATORS — **Insley Manufacturing Corp.**, Indianapolis, Ind., has put out an eight-page color booklet covering the Insley Model K-12 with complete detail and specifications. The type K-12 shovel, hoe, dragline, crane, clamshell and lorry specifications and working range dimensions are given. Drawings to scale of each type excavator are also pictured.

FOR BETTER HIGHWAYS—**Littleford Bros., Inc.**, Cincinnati, Ohio, has released a well illustrated, green and black broadside, "4 Units for Better Highways." The Spray Master pressure distributors, road brooms, "tankar," steam heater, and supply tanks are described; the function of each unit and the difference in the various models is explained.

SHEETS AND SCRAPERS — **American Tractor Equipment Corp.**, Oakland, Calif., announces the publication of new specification sheets on their lines of land-leveling scrapers, bulldozers, roadbuilders, and hydraulic P.V.T. assemblies. The sheet contains photographs of the equipment, as well as detailed information on construction and operating features. A four-page illustrated bulletin discussing the new two-wheel scrapers has also just been published. Designed for high-speed use with wheel

tractors, the open-top scrapers feature a low center of gravity, independent front apron, and a rear apron that cleans the scraper bowl sides as the load is dumped. A special hitch assembly eliminated the front trucks of the scraper, enabling the pulling tractor to carry part of the scraper load. If desired, however, front truck assemblies may be added for conventional operation with crawler or wheel tractors.

DIESEL ENGINE FILTERS—**Purolator Products,** Newark, N. J., has completed preparation of a new catalog on oil filter applications for Diesel engines. This 16-page catalog is profusely illustrated. It contains scaled diagrams of the many types of oil filters made by Purolator for Diesel engine applications. The description page for each filter also includes a detailed specification chart giving all necessary technical information on construction, dimensions, capacity, weight, etc. There is also a reproduction of the A.S.T.M. standard viscosity-temperature chart for liquid petroleum products. Of particular interest is the P Type or Micronic element. This is the element which embodies the revolutionary process developed and patented by Purolator for impregnating selected cellulose with a resin which will withstand the effects of high pressures, varying temperatures and at the same time permit a degree of filtration so fine as to be measured in microns.

SCRAPERS — **LaPlant-Choate Manufacturing Co., Inc.,** Cedar Rapids, Iowa, has made available two new folders illustrating and describing the hydraulic and cable-operated scrapers. The hydraulic scraper pamphlet shows many action pictures of the company's four-yard scraper at work on a variety of jobs and describes the type of work to which the scrapers are best adapted. It illustrates how the two-wheel scraper can be used with most types of industrial rubber-tired tractors of sufficient draw-bar horsepower while the four-wheel scraper can be used with any track-type tractor within 35-55 draw-bar horsepower range. The cable-operated scraper booklet not only describes and illustrates job applications of these scrapers, now available in 6, 8 and 14 yard capacities, but also gives production and cost figures and points out how maximum production can be obtained.

FIGHT WATER—**Sika Chemical Corp.,** Passaic, N. J., has just released a new pamphlet "Fight Water." This pamphlet, in condensed, easy to read form describes methods and products used to solve problems in concrete and masonry construction. New construction specifications and sketches are given for concrete mortar, surface protection and joints. Highlights are presented on maintenance and report problems such as sealing leaks against pressure and repairing structures above and below grade. A convenient check-list on all products manufactured by the company completes the folder.

PIPELINES AND HAULING—**Caterpillar Tractor Co.** of Peoria, Ill., has published two booklets, "Pipeline Construction" and "Going Places on Rubber." A description of many of the pipeline laying jobs around the country is given in the pipeline booklet, some of the major operations in the field are presented and the power required to make success possible is stressed. High speed off-road hauling is discussed in the recent Caterpillar publication "Going Places on Rubber." Rubber tired equipment is described operating on a range of jobs where high speeds are required on long hauls. The 8-page booklet presents the equipment best suited to handle the situation encountered on such operations as rock work, leveling and filling. Such operations as dam, road, airport and right-of-way construction, mine and quarry jobs, where it is necessary to carry large loads long distances, are pictorially and editorially described.

BRASS AND COPPER—**Chase Brass and Copper Co.** of Waterbury, Conn., has sent off the press a new and handsomely illustrated brochure dealing with the more common uses of brass and copper in the home, including such uses as radiant heating, plumbing, roofing, and screening. Printed in color, and with lavish use of photographs and drawings, the 20-page booklet devotes several pages to radiant heating, including its early history dating back to the old Roman days and bringing the reader down to the modern and efficient applications of radiant heating in the home. It contains, too, an explanation of how radiant heating works, gives suggestions as to approved types of installation as well as a series of pertinent questions and answers on the subject. The booklet has been designed throughout for consumer information.

MODERN LIGHTING— **Solar Light Manufacturing Co.,** Chicago, Ill., has published a catalogue dealing with technical data for planned modern lighting of stores, offices, schools, banks and institutional buildings. Charts presenting the exact light distribution for determining the correct illumination for any size building, office or institution are featured in the catalogue. Actual photographs, illustrated drawings and charts show how various lights can be

utilized to create various effects in lines, forms and finish. The data in the catalogue were prepared from exacting photometric measurements, and represent years of research. Architects, contractors, technicians, industrialists and property owners will find the information stimulating and practical in planning new merchandising projects.

PANCAKE MOTOR — **Fairbanks, Morse & Co.**, Chicago, Ill., has published a 16-page, color booklet which very completely describes the design and characteristics of the company's new Axial Air Gap Motor or "pancake" motor. This motor is distinguished from the conventional type of motor by the fact that the air gap dimension is measured parallel to the axis of the shaft, as compared to a radial dimension in the conventional machine. There are definite applications for the axial air gap motor and it is for these that its use is recommended. The application, features of construction, dimensions of horizontal, vertical, and pivot base mountings, space and weight reduction and controls of the new motor are described and illustrated in the booklet.

No. 60 CRAWLER — **Schramm, Inc.**, West Chester, Pa., has released a color-bulletin covering the new Schramm No. 60 Crawler, a unit designed for maintenance and construction engineers who want utility and flexibility. The No. 60 Crawler packs the power for a variety of pneumatic tool jobs and many other emergencies. This model is a versatile unit that not only excels in furnishing air for pneumatic tools, but offers in addition the possibilities of operating many other attachments, some of which are illustrated on the back page of the bulletin, as well as the tractor feature that lends itself to towing, climbing and pushing.

TRAILERS—**Olson Manufacturing Co.**, Boise, Ida., has published three booklets describing Olson City, low bed trailers, and single and tandem axle bottom dump trailers. The growth of the Olson plant, its supplies and its personnel are discussed in the Olson City booklet. The trailer folders, with many interesting drawings, cut-away views, diagrams and photographs describe the operation of the trailers and their various parts, and the special functions of each. Specifications are also given.

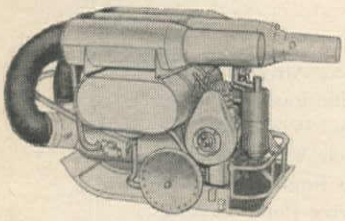
GRAVEL PIT SENSATION—**Universal Engineering Corp.**, Cedar Rapids, Iowa, has just released a four-color bulletin concerning the TwinDual Master portable gravel plant. The TwinDual Master is a complete 3-stage crushing, screening and loading plant in one single unit. Illustrations, diagrams and cutaway drawings show the TwinDual Master in use as well as the various parts of the unit, together with a complete description of the gravel plant.

HOME UTILITIES UNITS—**Building Utilities Unit Co.**, San Francisco, Calif., has literature describing a variety of packaged units for house, apartment, or hotel utilities, which can be adapted to either single or multi-story construction, and to conventional or prefabricated procedure. The units are obtainable only through contractors, and literature on them is available to architects and contractors.

WELLPOINT FACTS—**Griffin Wellpoint Corp.**, New York City, N. Y., is distributing a new catalogue, "Griffin Pointed Wellpoint Facts." This catalogue contains the latest information and photographs of wellpoint systems for dewatering, emergency and permanent water supply systems. Included are six pages of data on Jetting Pumps with on-the-job illustrations.

OPPORTUNITY SECTION

PORTABLE HEATER SALE IMMEDIATE DELIVERY



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CASE TRACTOR, Mod. AIW hydraulic shovel loader.
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1—Marion, Model 372, 2-yard Shovel, Crane & Dragline, with Cat. D-13000 motor.
1—Lima, Model 901 Dragline, 2½ yard.
1—Koehring, Model 803 Crane, w/ Caterpillar D-17000 motor.
1—Koehring, Model 604, Dragline, 1½ yard.
1—Koehring, Model 304, Dragline, ¾ yard.
1—Byers, Model 55 Crane.
1—Byers, Model 65 Truck Crane.
Shovel Fronts for Northwest Model 25, Model 6 and Model 80-D.
3—Caterpillar D-8 Tractors, 1H Series.
2—LaPlant-Choate Carryall Scrapers, 22 yard.
4—LeTourneau Model LS Scrapers.
1—LeTourneau Model X Scraper.
1—Galion Motor Grader.
1—Adams Pull Grader.
3—Buckeye Chip Spreaders, 8 ft.
2—Sterling Dump Trucks, 12 yard, Rock bodies, Diesel power.
2—Huber Rollers.
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22 ft. clearance from floor to roof level at lowest point; floor to mezzanine, 8 ft. 7 in., and mezzanine to roof, 14 ft. 9 in.

Design permits enclosing walls of masonry, corrugated metal or asbestos as required.

Roof designed for live load of 40 lbs. per sq. ft. Steel purlins spaced 6 ft. 5 in. c.-c. for gypsum, wood or concrete roof.

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