HCN-05-1945

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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IN THIS ISSUE

Water Runoff Forecast
For the Western States

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By Northern Pacific Railroad

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To Maintain Highway Traffic

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To Vessel Repair Work

Unique Plywood Developed
For Postwar Production

Small Municipal Airport
Developed by C. A. A.

Water Supply Problem
Analyzed for Santa Barbara

FLOATING DRYDOCK mid-section en route from the outfitting dock in Vancouver to its berth in Swan Island basin. These stern-wheeler Willamette River boats were used in conjunction with the usual tugs to tow this large structure a distance of thirteen miles in five hours.

SMOOTH *Rope work*

DIGGING drainage channels on the desert to protect the Colorado River Aqueduct from the rare—but extremely heavy—desert rains is one of the countless jobs for construction equipment in which smoothly functioning wire rope plays an essential part.

On construction jobs everywhere, smooth wire rope work is essential for efficient, trouble-free operation of draglines, shovels, hoists, etc. Knowing this, experienced contractors always keep wire rope in condition with effective lubrication—*Texaco Crater.*

Texaco Crater penetrates into and preserves the core of wire rope, preventing collapse. It seals each wire in a tough viscous film that reduces internal friction and wear, keeps out moisture, prevents corrosion. Keeps rope strong longer.

Used on open gears, *Texaco Crater* cushions load shocks, quiets noise, reduces wear. It doesn't channel or throw off, but clings to tooth surfaces, following through from gear to gear, despite high pressures and temperatures, and peripheral speeds.

Texaco lubricants have proved so effective in service they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write:

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

THEY PREFER TEXACO

★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

TEXACO REG. T.M.

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

NORTHWESTS! COUNT EM!

8 BIG SHOTS in the battle of San Francisco's Municipal Airport

Sure, a Shovel can win a battle—that is the *right* Shovel! The battle here was to finish the San Francisco Municipal Airport extention by February first 1945—a battle to get 3,089,000 cu. yds. of fill, three miles over two main highways and a railway, all packed with traffic.

To do this over 250,000 additional cu. yds. had to be moved and an overpass built to assure the elimination of hauling delays.

This was one of those jobs where everything had to click. There was no room for delays on the part of temperamental machinery.

It is significant that Macco Construction Co. and Morrison-Knudsen, long time Northwest users, put their Northwests on the job and their faith was well justified in the completion of the fill well ahead of time.

Dependable equipment is profitable equipment. Remember some of the things we have told you for your post-war contract plans. If you have a real Rock Shovel, you'll never have to worry about output in dirt.

NORTHWEST ENGINEERING COMPANY
1736 Steger Bldg., 28 E. Jackson Blvd., Chicago, 4 Ill.

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

-and when you have a real Rock Shovel you won't have to worry about output in dirt

Northwest Sales Agents: ARNOLD MACHY CO., INC., 149 W. 2nd South St., Salt Lake City, Utah;
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Branch Offices: 255 Tenth St., San Francisco, Calif.; 1234 Sixth Ave., South, Seattle, Wash.;
3707 Santa Fe Avenue, Los Angeles, Calif.

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Covering the Western Half of the National Construction Field

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J. M. SERVER, JR.
Editor

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J. O. HODGES, District Manager

EASTERN OFFICE
5833 So. Spaulding Ave., Chicago 29, Ill. . . . . Telephone PRospect 1685
A. C. PETERSEN, District Manager

WASHINGTON OFFICE
1120 Vermont Ave., NW., Washington 5, D. C. . . . . Telephone District 8822
ARNOLD KRUCKMAN, Associate Editor

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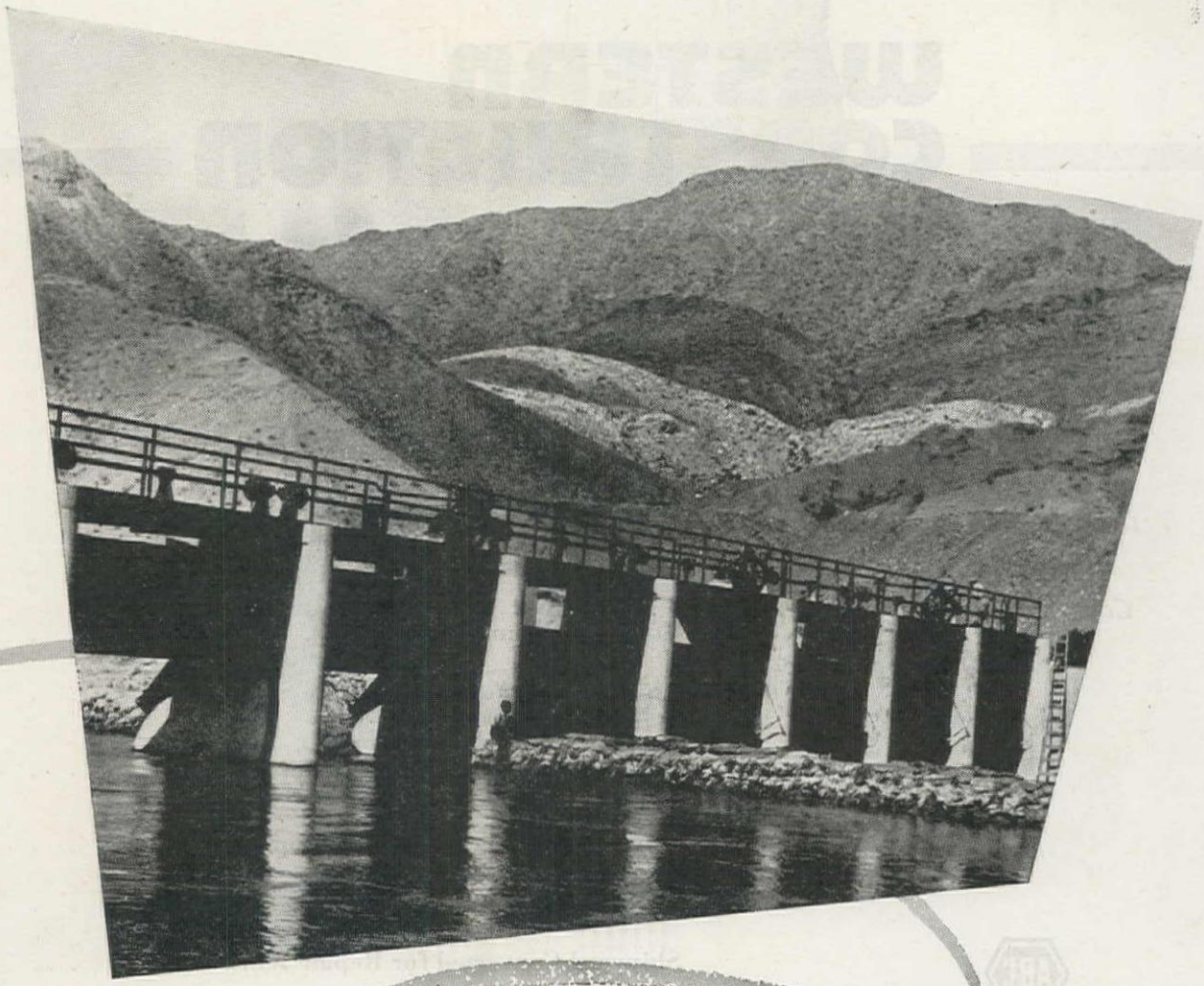

Proved Protection

Recent inspections of the American Dam
of the International Boundary Commission
show that the Barrett Coal-tar Enamels applied
to the gates in 1937 are in perfect condition . . .
another example of the proved protection
provided by these time-tested coating materials.
Barrett Waterworks Enamels meet the
American Water Works Association's
Standard Specifications 7 A.5
and 7 A.6—1940.

Barrett
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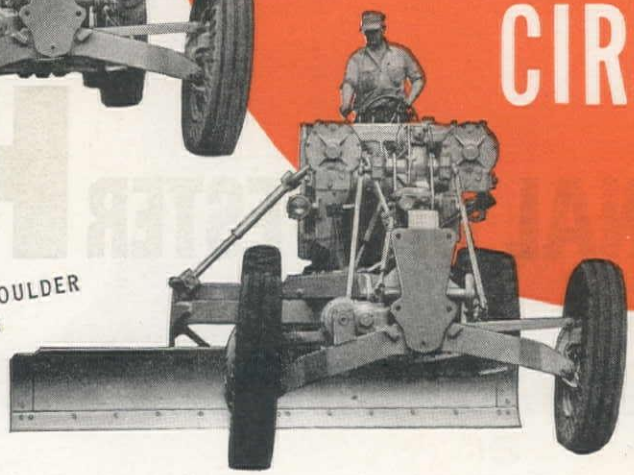
ENAMEL

FIELD SERVICE—Our Pipeline Service Department and Staff of Field Service Men are equipped to provide both technical and on-the-job assistance to engineers and construction men in the use of Barrett Enamels.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

ADAMS MOTOR GRADERS PROVIDE *All of these Positions...* WITH BLADE CENTERED ON CIRCLE



● Fast power-operated cab controls accurately position Adams Motor Grader blades for all average surface, ditch and bank work—quickly, efficiently—*without shifting blade on circle or even adjusting the blade lift links!* Occasional cuts calling for unusual blade positions are easily handled through simple adjustment of the telescopic lift links. Only on the most extraordinary work, where extreme blade positions are demanded, is it necessary ever to shift blade on the circle. Thus do advanced Adams design principles assure you of fast, economical operation—*high production at low cost!* A local Adams dealer is near you. Consult him for full information and present availability of Adams Equipment.

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INDIANAPOLIS, INDIANA
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The Lang Company, Salt Lake City, Utah

ADAMS ☆ ROAD-BUILDING AND ☆ EARTH-MOVING EQUIPMENT

INTERNATIONAL *Trucks*

Product of INTERNATIONAL HARVESTER

Emblem of all-truck stamina, of rugged dependability and economical operation! Yes, the International Triple Diamond trade-mark at left above is the identifying mark on powerful trucks—trucks that faithfully hauled raw materials and finished goods for America at peace . . . that haul raw materials and finished products for America at war . . . that are fighting instruments in the hands of fighting men on Allied fronts everywhere.

One measure of International Truck quality is this—in the 10 years before the war more heavy-duty International Trucks were sold than any other make. Another is—International Truck Service, the nation's largest company-owned truck-service organization.

International Harvester products are a family—trucks, industrial power, farm tractors and farm equipment. A new symbol to identify the family *as a family* has been chosen—the IH at right above. This symbol does not displace the Triple Diamond on International Trucks. It means Product of International Harvester—vital, basic and essential to America at war and peace.

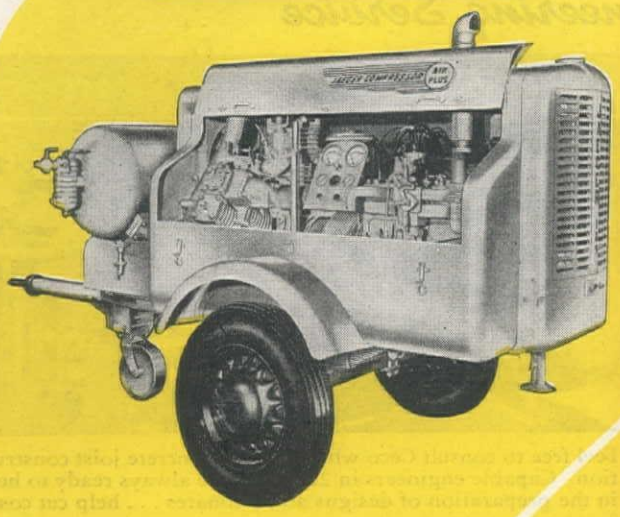
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

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

INTERNATIONAL *Trucks*

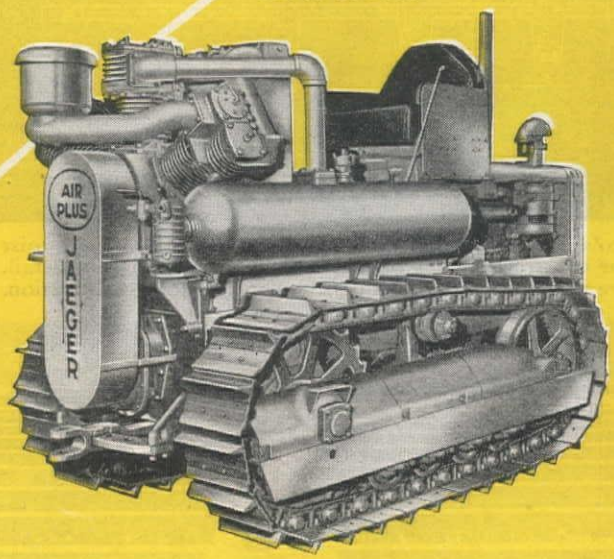
INTERNATIONAL

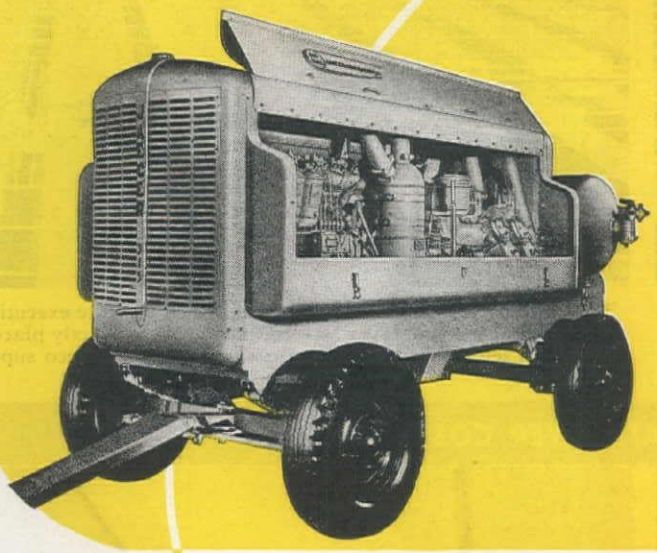
AIR PLUS JAEGER COMPRESSOR



High Speed 2-Wheel Trailers
60 and 105 Ft.

"TRAVEL-AIR" Tractor-Mounted
and Powered Compressors
160 to 315 Ft.





4-Wheel "Auto-Steer" Trailers
210 to 500 Ft.
Gasoline and Diesel Powered

Truck-Mounted Models 60 to 500 Ft.

Engineered for war, where rugged toughness and low fuel consumption are military "musts", these precision-built Compressors are ready to travel and deliver air for today's toughest construction jobs, at lowest known cost in fuel and upkeep. Send for complete catalog describing the most advanced line of air compressors in America.

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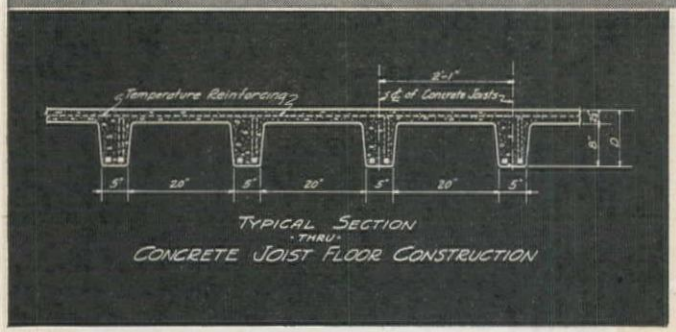
- **EDWARD R. BACON CO., San Francisco 10, Calif.**
- **CONNELLY MACHINERY CO., Billings, Great Falls, Mont.**
- **WESTERN MACHINERY CO., Salt Lake City, Utah**
- **SMITH BOOTH USHER CO., Los Angeles 54, Calif., and Phoenix, Ariz.**
- **A. H. COX & CO., Seattle 4, Wash.**
- **TRACTOR & EQUIPMENT CO., Sidney, Mont.**
- **WORTHAM MACHINERY CO., Cheyenne, Wyo.**
- **NELSON EQUIPMENT CO., Portland 14, Ore., Spokane, Wash., Twin Falls, Ida.**

How to lower centering costs and speed up construction

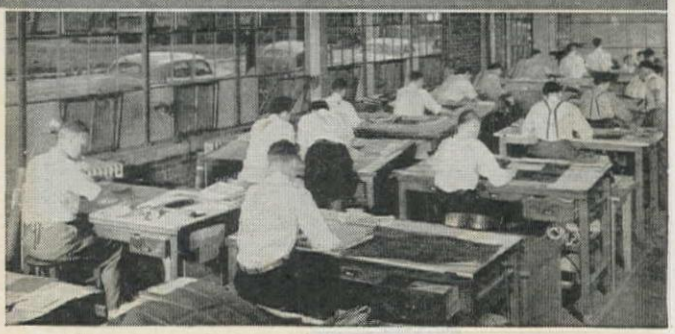
USE CONCRETE JOIST CONSTRUCTION

and CECO *Engineering Service*

STEP 1. CECO ENGINEERS PREPARE INSTALLATION DETAILS



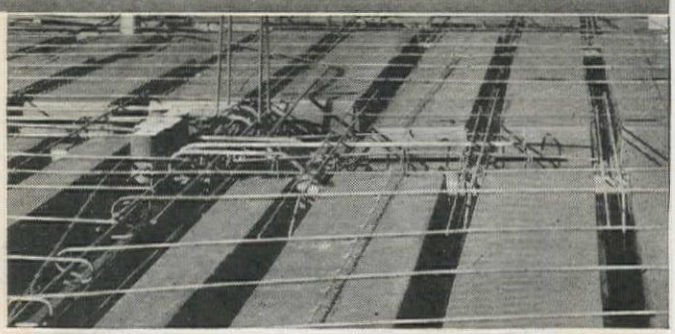
Ceco's experience with 250,000,000 sq. ft. of concrete joist floor construction lies behind every Ceco installation detail. Here is a typical cross-section thru concrete joist construction.



Feel free to consult Ceco when you use concrete joist construction. Capable engineers in 22 offices are always ready to help in the preparation of designs and estimates . . . help cut costs!

STEP 2. CECO CONSTRUCTION EXPERTS SUPERVISE PLACING OF MEYER STEELFORMS

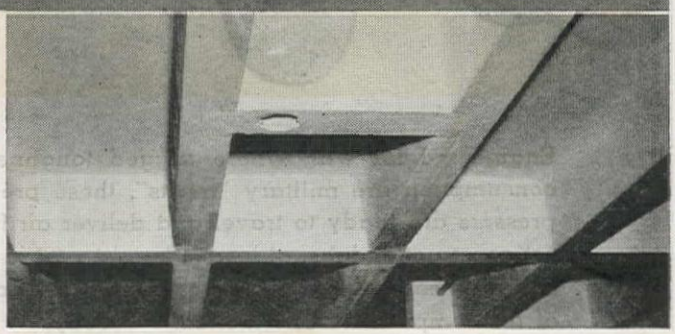
All Meyer Steelform construction requires is this simple open wood centering that may be re-used from one floor to next as can Meyer steelforms. Eliminate extra lumber cost, save time, increase efficiency.



To eliminate leakage of concrete and insure accurate execution of structural design Meyer Steelforms must be correctly placed. Here you see the proper accurate alignment on a Ceco supervised job.

RESULTS: NEAT TRIM CEILING JOISTS AT LOWER COST!

Here you have fireproof construction at the cost of non-fireproof construction. This clean functional ceiling used to advantage in warehouses, light manufacturing buildings and garages!



Close-up shows the finished character of ceiling joists built with Meyer Steelforms. Concrete joists can be left exposed or finished with a flat ceiling hung from the construction.

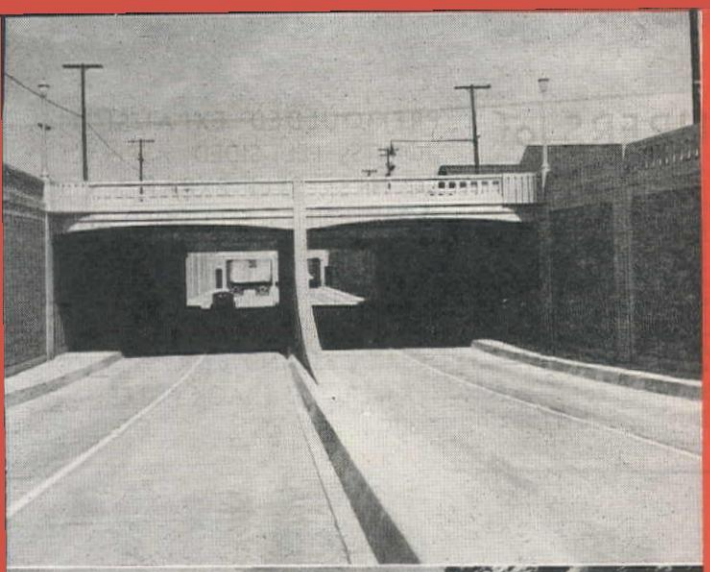
30 YEARS OF EXPERIENCE IN REINFORCED CONCRETE!

CECO STEEL PRODUCTS CORPORATION

Concrete Engineering Division—5701 W. 26th St., Chicago, Ill.

MANUFACTURING DIVISION, SHEET STEEL AND WIRE DIVISION, HIGHWAY PRODUCTS DIVISION

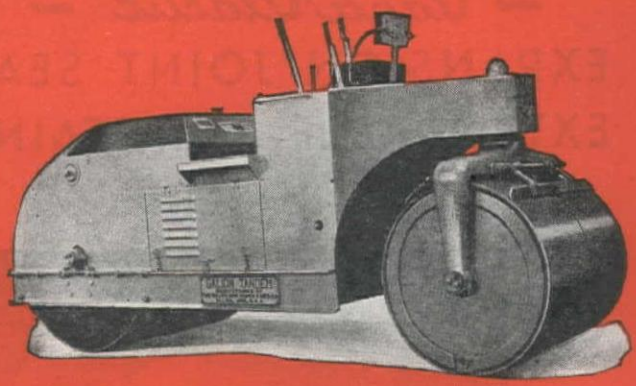
ENGINEERING MAKES THE BIG DIFFERENCE IN CECO CONSTRUCTION PRODUCTS

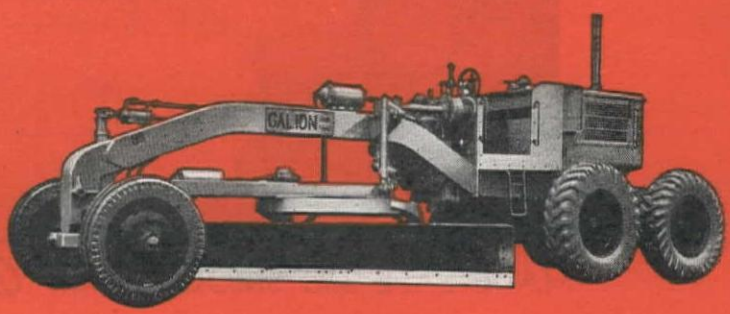


GALION

ROLLERS AND GRADERS

ARE economically building the Nation's highways — Hitting the tough spots with plenty of power.





Road building jobs call for POWER equipment that can be relied upon to bank, ditch, widen, slope, cut, spread and roll economically and efficiently. The West is proud of its GALION equipment for rendering this valuable service in building its magnificent highways. There is a Galion Distributor near you — write him for figures showing low cost operation.

DISTRIBUTORS IN MOST LARGE CITIES

The GALION IRON WORKS & MFG. CO.
GALION OHIO

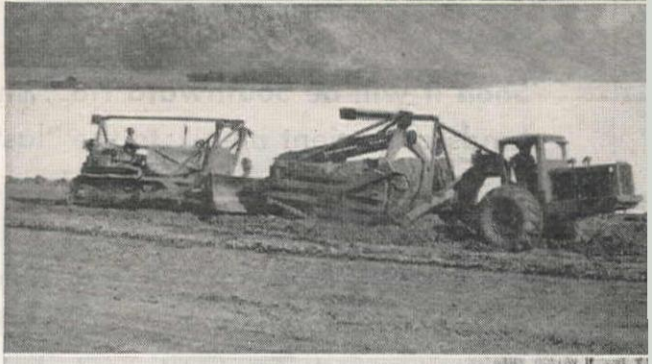
TOURNAPULLS
Your Best Bet for PROFIT-MAKING on all dirtmoving jobs

for Airports:

Plans for new and improved fields and landing strips show emphasis on shallow cuts, traffic over runways, and long-haul dirt. (Above) To handle fine grading, 6 big rubber-tired Tournapulls hauled on and across previously surfaced runways at Muroc Airfield, Calif.

for Roadbuilding:

Much of this work will be reconstruction . . . straightening, widening, extending curves, lowering grades. Most of it involves light cuts, long trips, on-pavement haulage — Tournapull specialties. (Above right) to improve drainage on 28 miles of Ill. Hwy. 66 near Serena, Dixon Construction Co. used 2 Super C Tournapulls.



for Water Control:

Extensive use of LeTourneau equipment on dams, levees, canals, and other water control projects has proved Tournapulls' big yardage ability. (Right) 4 Tournapulls built Lake Minnewanka dam near Banff, Alberta; owner Mannix & Co. also stripped coal mines and built an airport with the same rigs, profiting by Tournapull versatility.

for Stripping:

Low yardage costs resulting from Tournapull economies on long-haul dirtmoving offer extensive opportunities for contract mine and quarry stripping . . . profitable work for your men and equipment. (Right) Stripping iron ore near Cedartown, Ga., 2 Tournapulls replaced shovel-trucks . . . strip, load ore, dump to grizzly at washing plant, economically increased output for Arrington Mining Company.

for Railroad Grading:

To meet heavy, high-speed traffic needs, railroads plan extensive grade reconstruction. Many of these jobs are being handled by Tournapulls . . . definitely indicating another profitable dirtmoving market for contractors. (Below right) 6 Tournapulls helped move 2,300,000 cu. yds. on Rock Island relocation between Perlee and Eldon, Ia.; Peter Kiewit & Sons Co., contractors.

Tournapulls have repeatedly demonstrated their special ability for dirtmoving in all these fields. The indicated need is for: (1) adaptability to all haul lengths, (2) high-speed for quick completion, (3) ability to handle large or small jobs, (4) hauling over pavement, (5) quick, low-cost, job-to-job moves, plus (6) lowest net costs for moving dirt. All these needs make Tournapulls your best bet for every one of these big, profit-making postwar markets. Make plans now . . . see YOUR LeTourneau distributor TODAY.

C24

JOB-PROVED Over 2900 Built and Shipped

LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

FOR LOWEST NET COST PER YARD

SOUTHWARD HO!

Soon it will be Southward Ho... into the lands of ancient men... to the "last frontiers of the Western Hemisphere." The Pan American Highway System will open the way to new, unexplored, unknown riches... commercial trade... exchange of tourists, culture and knowledge.

A dream in 1924... it is expected to be opened for all weather travel late in 1947. Only gaps remain to be completed. Beginning at Nuevo Laredo, Mexico, it links the capitals of 17 Latin American countries — as far south as Buenos Aires, Argentina, thence north to Rio de Janeiro, Brazil.

Constructing this link to American solidarity is one of the toughest jobs ever undertaken. Carved through treacherous mountains, jungles and swamps it is an outstanding achievement . . . a worthy monument to its planners and builders, and to the efficiency of modern road building machinery. A great number of Allis-Chalmers tractors and graders are playing an important part in the building of this lifeline.

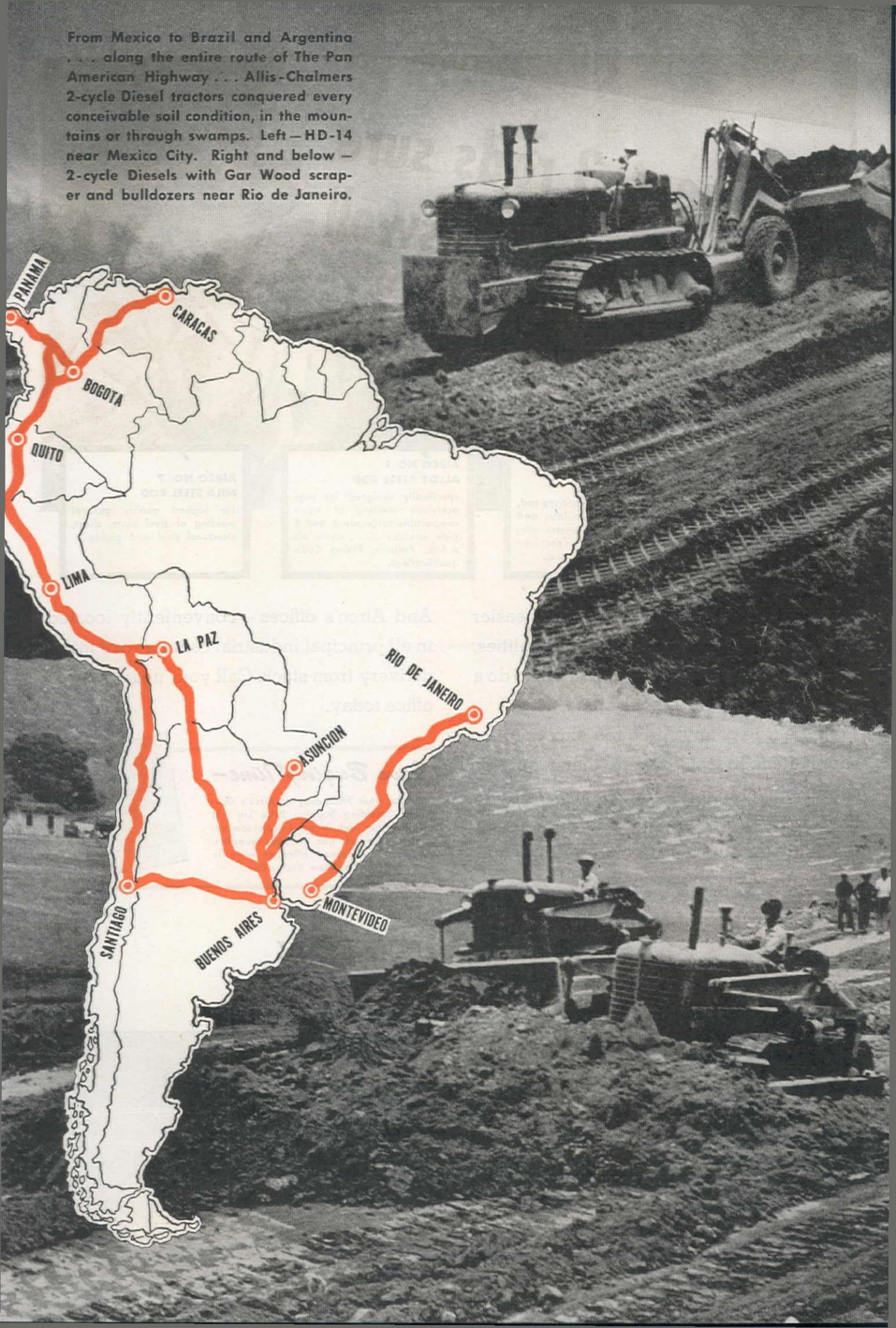
See The Movie!

Allis-Chalmers will gladly loan its film "Pan American Highway" to interested groups. In 45 minutes it takes you the length of this picturesque route in colorful Kodachrome (16 mm. sound). Make arrangements now. Write.

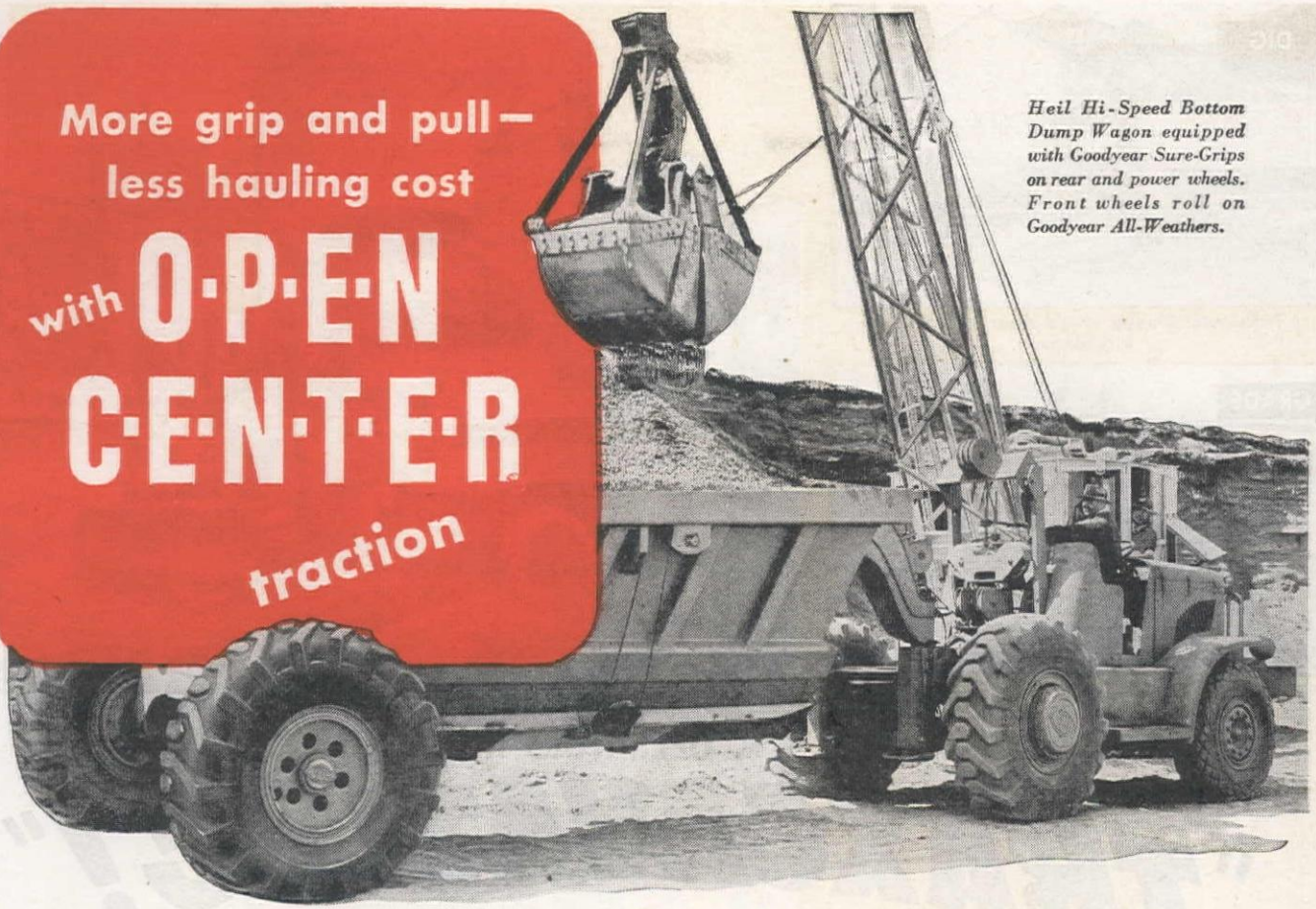
ALLIS-CHALMERS

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

From Mexico to Brazil and Argentina . . . along the entire route of The Pan American Highway . . . Allis-Chalmers 2-cycle Diesel tractors conquered every conceivable soil condition, in the mountains or through swamps. Left — HD-14 near Mexico City. Right and below — 2-cycle Diesels with Gar Wood scraper and bulldozers near Rio de Janeiro.



More grip and pull— less hauling cost with O·P·E·N C·E·N·T·E·R traction



Heil Hi-Speed Bottom Dump Wagon equipped with Goodyear Sure-Grips on rear and power wheels. Front wheels roll on Goodyear All-Weathers.

SURE-FOOTED traction through any going — even on shifty soils like mud, clay and sand — is a must for keeping today's bigger yardages moving on schedule.

That's why more and more contractors now buy Goodyear Sure-Grips for their power wheels. They know that the time-proved *open center* tread of this great husky gets more grip and pull in any ground — pulls sure and steady under the heaviest loads — helps lower hauling costs.

Here's why: Those massive lug bars are unconnected at the center — open at *both* ends. So they dig in deeper, bite cleaner and sharper, provide steady, maximum traction under all conditions. And with no closed corners to clog up with mud, it's a *true* self-cleaning tread. Those wide, unblocked channels sluice out dirt, mud and stones, leave the sturdy lugs free and clear to bite deep and pull better every time.

Now superarmored with Goodyear's patented Rayotwist cord — *which makes the strongest body we've ever used in a work tire* — these really tough giants are the finest off-the-road tires that can be built from today's synthetic and permissible natural rubber.

Power your drive wheels with these Goodyears and you'll soon know why "more tons are hauled on Goodyear truck tires than on any other kind."

THE RIGHT TIRE FOR EVERY JOB

ALL-WEATHER EARTH-MOVER for drawn vehicles

HARD ROCK LUG for all rock work

SURE-GRIP for drive wheels

Sure-Grip, All-Weather, Rayotwist—T.M.'s The Goodyear T. & R. Co.

GOODYEAR

THE GREATEST NAME IN RUBBER

Traxcavator digging up old street surfacing in a Virginia town.

Traxcavator grading between lanes on U. S. Highway 30, near Valparaiso, Indiana.

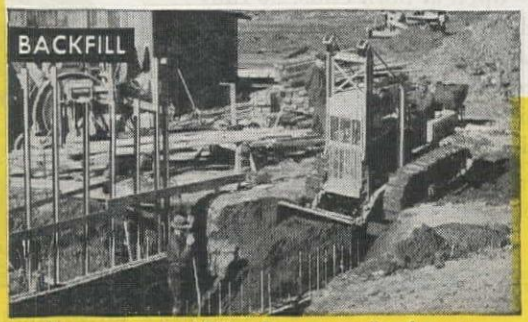
OPERATORS KNOW THE WORD FOR IT—

"TRAXCAVATING!"

TRAXCAVATORS do so many tasks well that operators coined a word to cover all of them. It's "Traxcavating!" It fits TRAXCAVATORS like a glove, for these multi-purpose machines, powered by "Caterpillar" track-type tractors, dig, grade, load, carry and do many other earth-moving and material handling jobs easily, quickly and at low cost. Ask your Trackson — "Caterpillar" dealer how TRAXCAVATORS can help you, or write to TRACKSON COMPANY, Dept. CM55, Milwaukee 1, Wis.

Traxcavator excavating and loading for barracks foundations at an army camp, Indianapolis, Ind.

Traxcavator preparing right-of-way for a cross-country pipe line in Illinois.



Traxcavator backfilling between walls of a percolating dam at San Jose, California.

TRAXCAVATOR

REG. U. S. PAT. OFF.

DIGS
GRADES
THE ORIGINAL TRACTOR EXCAVATOR
LOADS
CARRIES

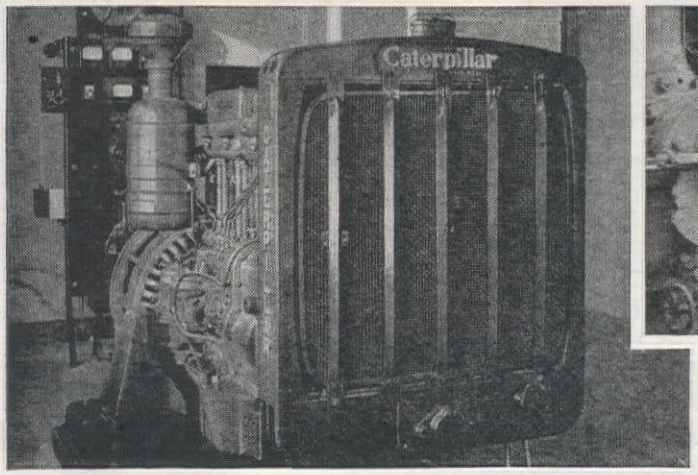
THE YEARS TELL THE *Story of their life*

WHEN you buy a "Caterpillar" Diesel Engine,* it won't take you long to discover the size of the load it can handle. Or the amount of machinery it can drive. Or the smoothness with which it runs. Or the little attention — and practically no adjustments — it requires. Or the amazing amount of power it can wring out of a gallon of low-grade, low-cost fuel.

For these things can be measured. Or seen. Or figured in economical dollars and cents.

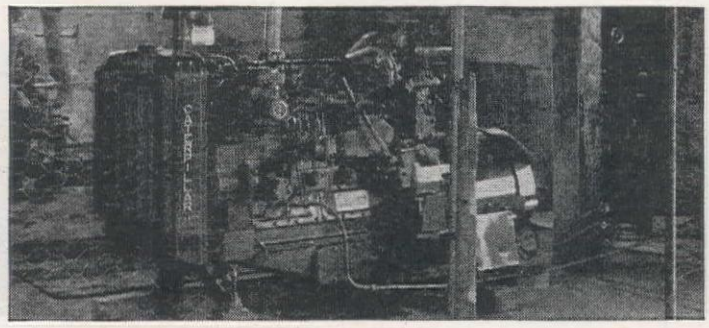
But to estimate its maximum serviceable life would ordinarily be a matter of waiting — for years. Today, however, you can judge pretty closely by the records of plenty of other engines just like it . . . work engines that have "been through the mill" and have many thousands of hours of actual running behind them. Cited here are just a few of such records.

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



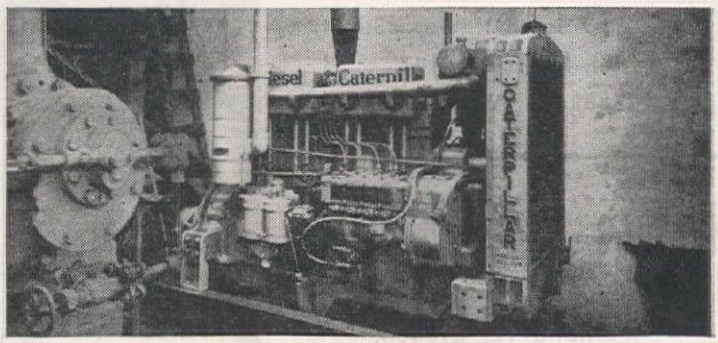
21,400 HOURS

This "Caterpillar" Diesel Electric Set was installed nearly seven years ago as an emergency lighting plant at the Syracuse Airport. Required only 12c worth of repairs during its first 3½ years of service.



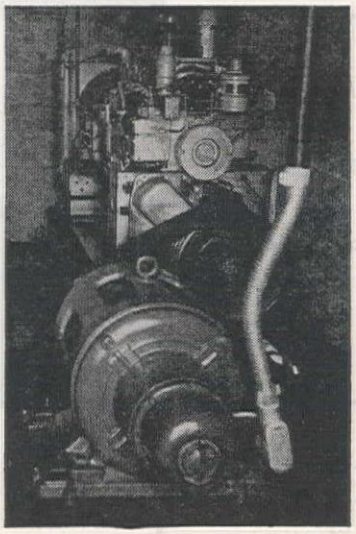
34,400 HOURS

This "Caterpillar" Diesel D4400 powering electric generator was installed in 1940. Operates 24 hours a day furnishing light and power for the town of Haswell, Colo.



65,000 HOURS

A "granddaddy" among "Caterpillar" Diesels, this D7700 drives an ammonia compressor used in cooling two rooms for the A. J. Krecker Co., Chicago. Record includes 9000 hours of almost continuous running with little or no maintenance expense.



32,000 HOURS

This record was made by this "Caterpillar" Diesel D4400 in exactly 5½ years, producing power for incubators, battery brooders, water pumps, lights, etc., for the Bolton Farms Hatchery, Schoeneck, Pa. Runs 24 hours a day, seven days a week, and is seldom shut down more than once in two weeks.

CATERPILLAR DIESEL ENGINES

REG. U.S. PAT. OFF.

* The horsepower of "Caterpillar" Diesel Engines is ALL WORKPOWER. Ratings show sustained output of a fully equipped engine—not the momentary peak performance of a power-plant stripped of fan, pumps or other necessary accessories.

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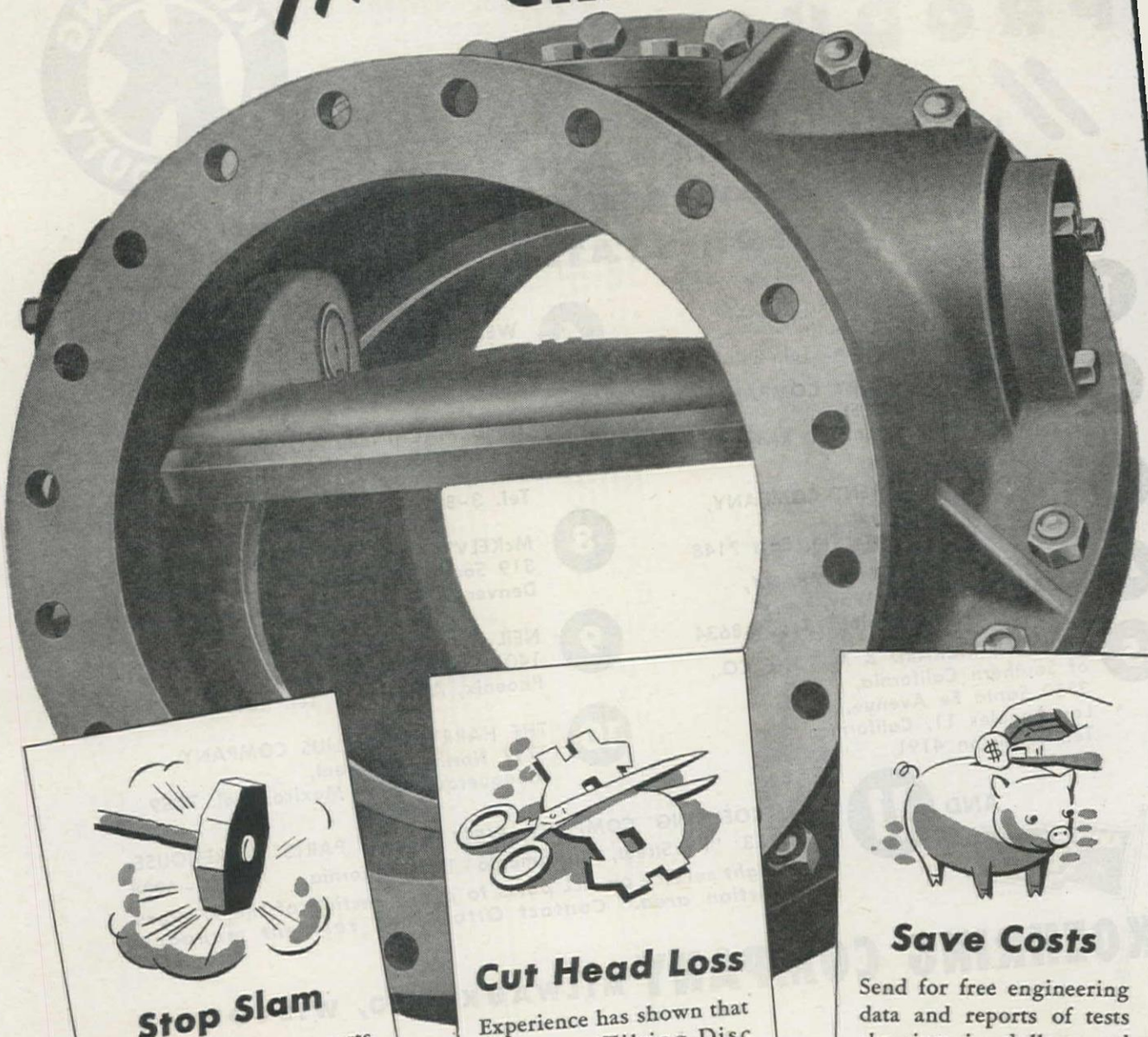
Two factory-trained representatives, J. Leo Lamley and Lawrence H. Belling, are regularly assigned to the Western States. These practical Western construction men stand ready to analyze your job, to help you select the right machine for the job and to help you get the most out of the machine you choose.

CHAPMAN Tilting-Disc CHECK VALVES



Stop Slam

which jars pipelines, starts surging and opens up pipe joints. Balanced hinge-pinned disc rides evenly in the flow when valve is open—cushions quietly to a drop-tight seat when the flow slows down.

Cut Head Loss

Experience has shown that Chapman Tilting-Disc Valves invariably save from 65% to 80% in head losses over conventional type check valves.

Save Costs

Send for free engineering data and reports of tests showing in dollars and cents substantial cuts that have been made in pumping costs when Chapman Tilting-Disc Check Valves were installed.

The CHAPMAN VALVE Mfg. Co., Indian Orchard, Mass.

CHAPMAN NON-SLAM CUSHIONED CLOSING **CHECK VALVES**

Equally efficient on horizontal or verti **cal installations on water, steam, oil, gas and air lines**

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Behind pulling POWER like this —

Something's Got to Move

WORLD'S LARGEST MANUFACTURER OF TRACTOR HOISTS AND WINCHES

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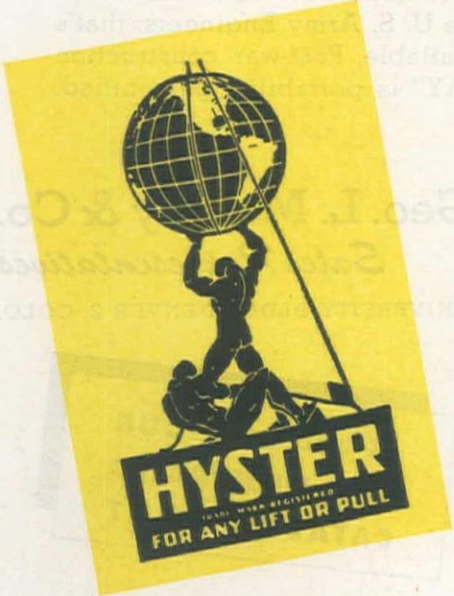

And move, it does . . . under the strong, steady line pull of this HYSTER Towing Winch. For here's controlled power with plenty in reserve to keep tractor and equipment moving under all ground conditions. Auxiliary power to supplement the tractor's drawbar pull. And wide utility service, for dozens of hoisting and towing jobs that only winch and cable can do.

HYSTERS are entirely direct gear driven and reversible in operation. All gears run in oil; all shafts turn on anti-friction bearings. Transmission case and side frames of electric cast steel stand up to severe services. Winch control levers, at driver's seat, allow operation while tractor is traveling or stationary.

Because HYSTERS are built especially for "Caterpillar" tractors, there's no time or labor lost in mounting. Frames are jig drilled for accurate fitting through regular bolt-up holes on the tractor. Mounting and service is available at your "Caterpillar" dealer.

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"QUICK-WAY"

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MOUNTS *on any* **5-TON TRUCK**

ENGINEERED PORTABILITY, proper balance for digging, all-steel construction for extra strength and less weight, simplicity of design for interchangeability of parts, speed of operation for increased yardage, added strength at strategic places, balance through carefully engineered placement of essential working parts... that's how "QUICK-WAY" TRUCK SHOVELS are being built for the U. S. Army Engineers; that's how they will be built for you when available. Post-war construction will demand portability... "QUICK-WAY" is portability personified.

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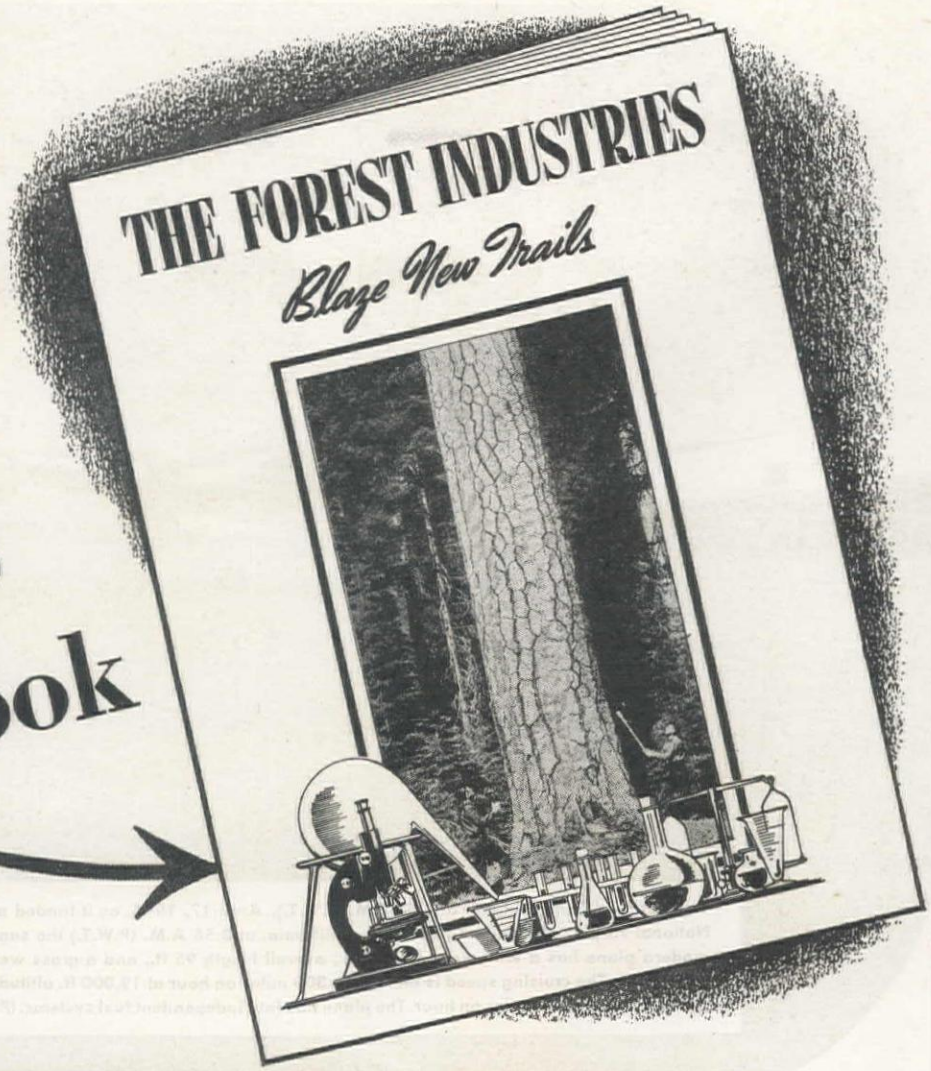

New TECO Services

This new book will be very helpful to executives, plant superintendents, chemical engineers, structural engineers and others in the wood-working, wood-chemistry and building fields.

It emphasizes the importance to all industry, of wood and its by-products and its derivatives —tells of new things ahead.

The new TECO services, now available through the Wood Products Development Shop and the Wood Chemistry Laboratory, are described for the benefit of those who may have problems concerning the physical, mechanical and chemical properties of wood and wood products. Learn how to make use of TECO SHOP-LAB equipment and technical staff in solving some of your postwar problems. Write at once for your copy—fill in and mail the coupon.

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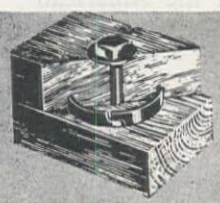

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View of the "Constellation" at 1:54 P.M. (E.W.T.), April 17, 1944, as it landed on the Washington National Airport after leaving Burbank, California, at 3:56 A.M. (P.W.T.) the same day. This ultra-modern plane has a wing span of 123 ft., overall length 95 ft., and a gross weight of more than 80,000 lbs. The cruising speed is more than 300 miles an hour at 19,000 ft. altitude, and the landing speed is less than 80 miles an hour. The plane has four independent fuel systems. (*Photo by Del Ankers.*)

CONCRETE PIPE LINES DRAIN THE NATION'S MAJOR AIRPORTS

When the TWA's 57-passenger Lockheed "Constellation" arrived at the Washington National Airport, Washington, D. C., April 17, 1944, after a record flight of 2,400 miles from Burbank, California, in 6 hours 57 minutes, it landed on runways safely designed and drained with concrete pipe. More than 64,000 ft. of concrete sewer pipe and reinforced concrete sewer and culvert pipe was required to build drains parallel to and under runways of the Washington National Airport.

Concrete pipe and reinforced concrete pipe ranging in diameter from 6 to 108 in. has been required to build drains, culverts, and sewers for most major airports of this country because of these advantages:

1. Maximum strength when properly bedded and back-filled;

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4. Furnished locally at reasonable cost by our members. List mailed on request.

When you design drainage systems for airports now and in the postwar period, specify concrete pipe complying with the tests and other provisions of the Standard Specifications of the American Society for Testing Materials and the American Association of State Highway Officials.

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Athey Force-Feed Loader removing sod and earth left in windrows by Motor Grader on maintenance operations on a State Highway.

THOUSANDS of miles of war-worn highways are scheduled to get high-priority attention during 1945. Highway maintenance, repairs and rebuilding are being given the "go ahead" as war-urgent projects. To help in relieving manpower shortages, and to speed highway maintenance jobs, Athey Force-Feed Loaders are in great demand by highway departments and engineers throughout the country. These loaders, working as companion tools with the "Caterpillar" Motor Grader, pick up and load windrowed material from road surfaces faster and cleaner than previous methods. They are a fast-working companion tool with the Motor Grader for road widening, ditch cleaning, slope trimming, loading oil mix material, salvaging road surface material and other highway maintenance operations. Athey Force-Feed Loaders load sod, earth, rock, sand, oil mix, trash and other materials better, quicker and cheaper. Get full facts now on this revolutionary loading machine. Ask your Athey-"Caterpillar" Dealer for further information, or write to Athey Truss Wheel Co., 5631 West 65th Street, Chicago 38, Illinois.

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FORCE-FEED LOADER

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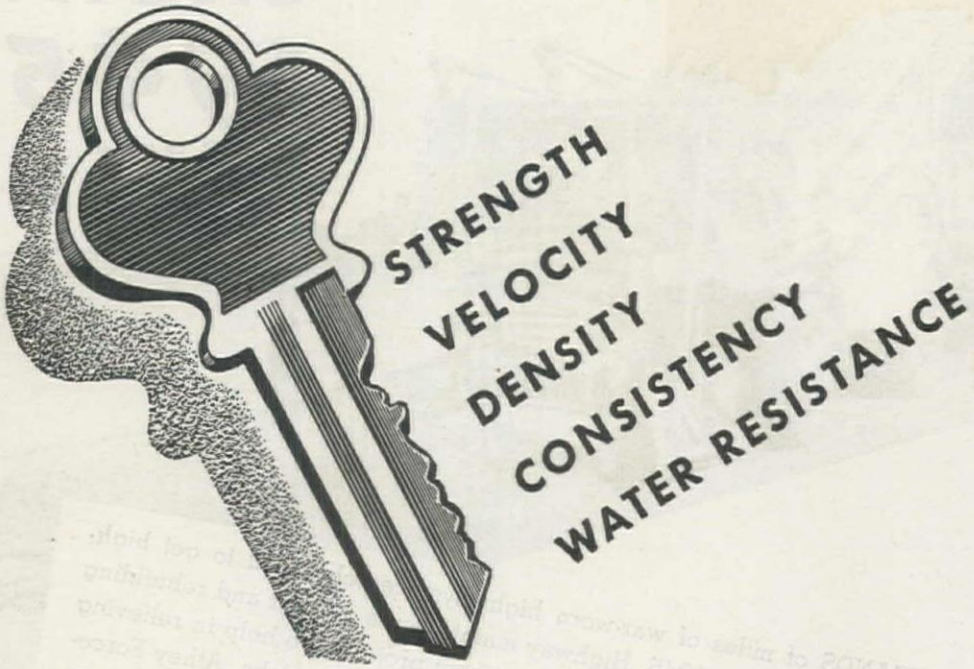
The Right Explosive Fits the Job Like a Key Fits a Lock



Choosing the right explosive is like picking out the right key to open a lock.

In a key, it's a matter of having the right combination of notches.

In an explosive, it's a matter of the right combination of properties. Strength, density, velocity, water resistance, consistency must all be properly balanced for best results.

In order to get just the right balance of properties, Atlas makes over 120 kinds and grades of explosives.

The Atlas representative has a specialized knowledge of these explosives and what they can do. You have a specialized knowledge of your ore and your operating methods.

Combine your knowledge of your job conditions with the Atlas representative's specialized knowledge of explosives to get out more ore at less cost.

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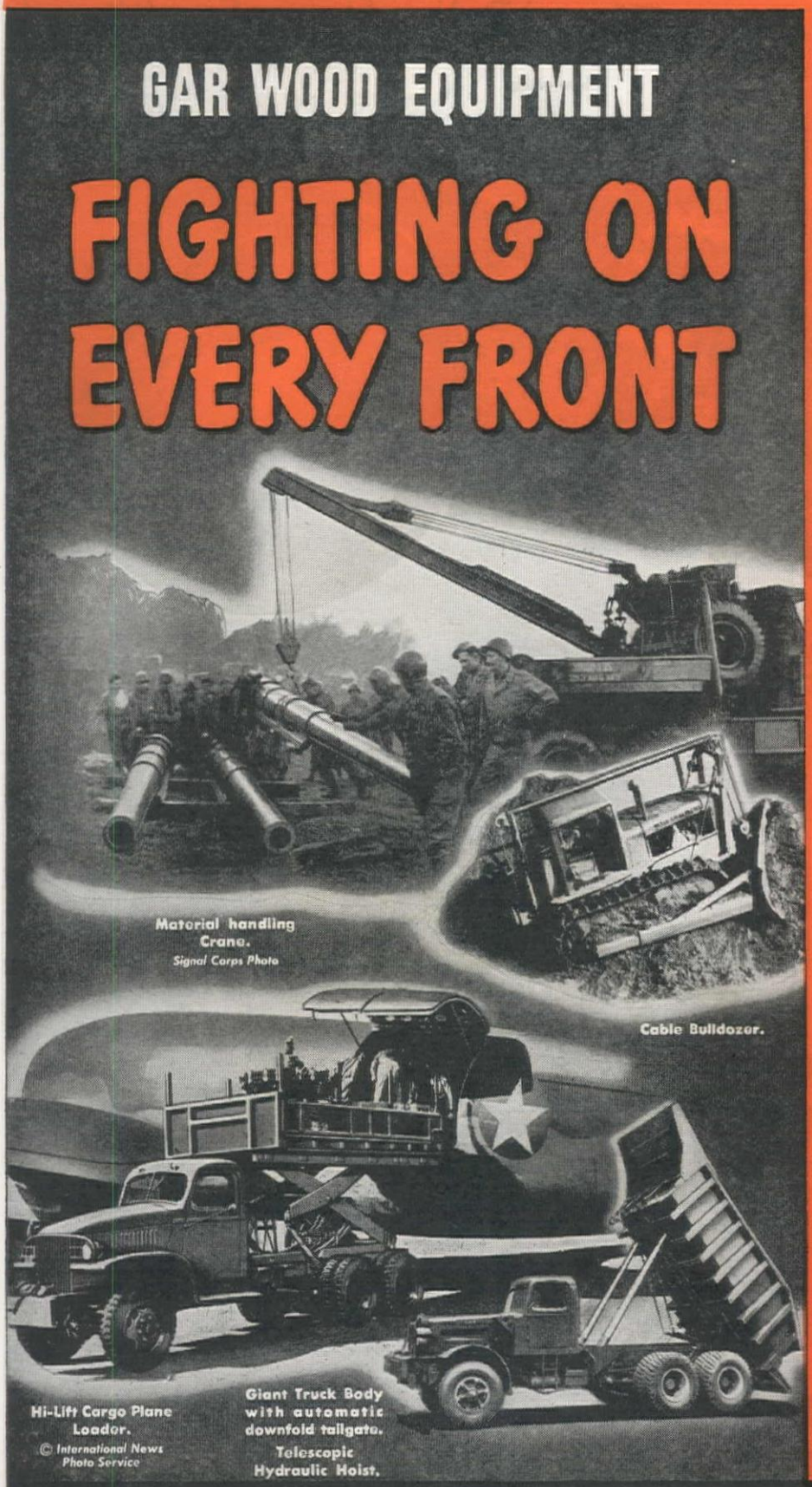

Material handling Crane.
Signal Corps Photo

Cable Bulldozer.

Hi-Lift Cargo Plane Loador.
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Giant Truck Body with automatic downfold tailgate.

Telescopic Hydraulic Hoist.

Somewhere off in the far Pacific . . . on the hard fought battlefields of Europe . . . in Asia . . . Africa . . . anywhere, you name it . . . that's where Gar Wood equipment is serving Allied Forces in a hundred different ways. Famed Bulldozers with a colorful history, earth-moving Scrapers, tireless Winches, Wrecker Cranes, Hi-Lift Plane Loaders, Hydraulic Hoists, Dump Bodies, gasoline, oil and water Truck Tanks . . . these and many others are the wartime products of Gar Wood. Each of the six divisions of Gar Wood Industries, Inc. specializes in its field, and each division is busy producing the fighting equipment it knows best how to build.

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Better living conditions mean more and better sanitation, running water, more gas, electricity and telephones that all call for trenching—millions of miles of it—dug fast and at low cost—and that calls for Buckeyes. Model 410 shown—is one of over a dozen models; ladder and rotary-digging wheel type.

Better living conditions for more people, for which we are now fighting, call for new airports and highways which will require proper drainage, new irrigation projects and aqueducts to bring ample water supplies to cities in need—as in the past, Buckeye trenchers will be available to dig the trench at minimum cost—*more and better Buckeyes.* Model 260 shown.

Today, and for a long time to come, as a nation we have millions of market baskets to fill, here and abroad. Buckeyes—the original and still the most widely preferred power trench digging machines—are even now aiding food production through reclamation drainage of lowlands and through soil conservation tiling. Model 1 shown.

If you are looking ahead — send for Trencher Catalog.

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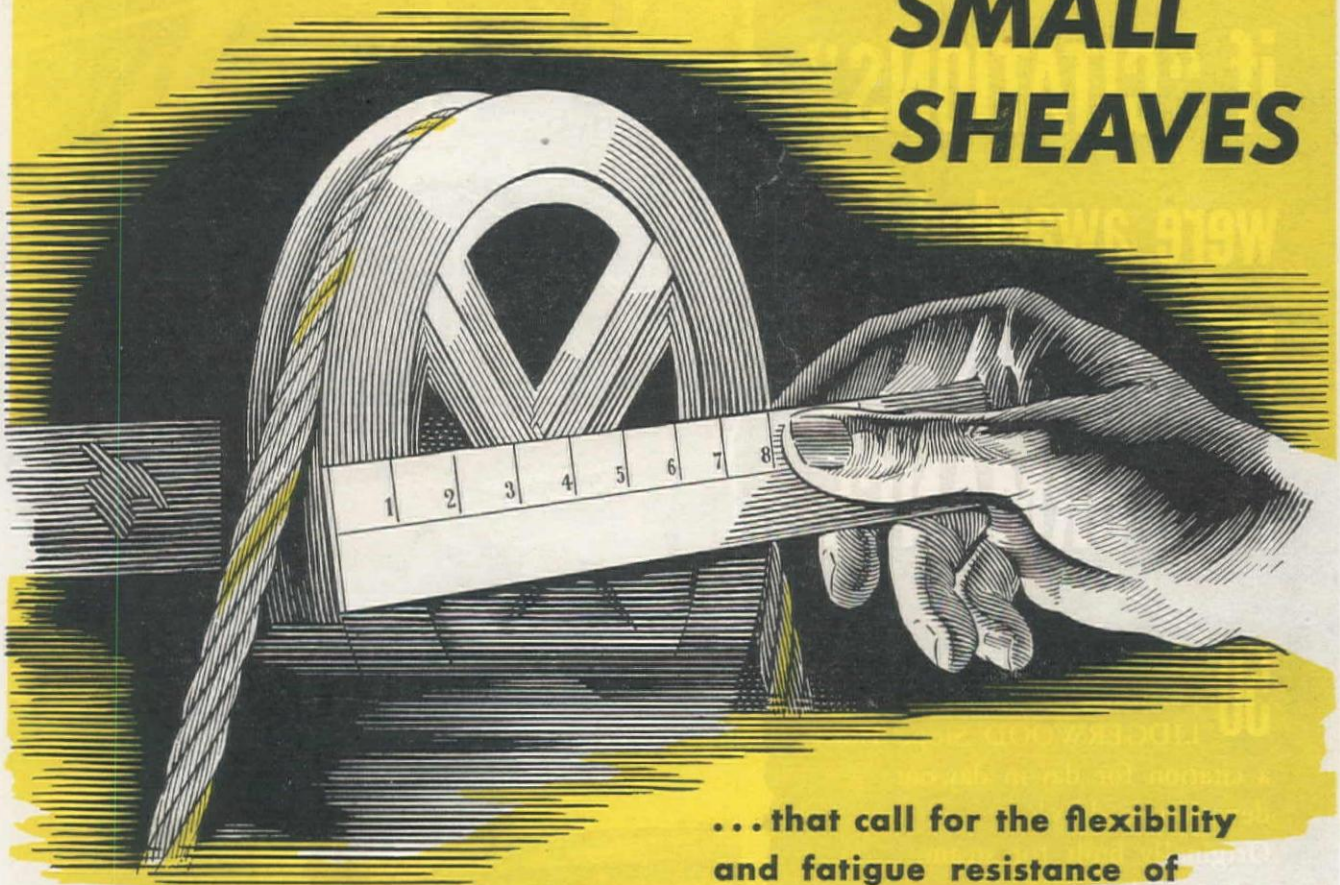
We still have with us . . .

SMALL SHEAVES



. . . that call for the flexibility and fatigue resistance of *PREFORMED* YELLOW STRAND

In a lot of equipment lines, old and new models will have one feature alike: small sheaves—perhaps accompanied by small drums. Either is tough on wire rope. Both should remind you to *minimize* their fatiguing effect by using *Preformed* Yellow Strand.

While reasonable bending is expected of unpreformed rope, severe bending tends to break down the steel itself. High speeds, heavy loads and reverse bends all hasten a premature end.

The *flexibility* of *Preformed* Yellow Strand enables it to hold its own *longer* against fatigue. Its wires and strands can concentrate on the *external* bending job, because *internal* stresses have been virtually neutralized during manufacture. Instead of having been forcibly twisted into place, the parts have been preshaped to the spiral curvature they keep in the finished rope.

Along with greater endurance, smooth-running *Preformed* Yellow Strand offers faster installation . . . higher kink-resistance . . . increased protection for workmen.

Specify *Preformed* Yellow Strand by name. Get all you should in wire rope performance and economy. Broderick & Bascom Rope Co., St. Louis 15, Mo. *Branches:* SEATTLE, Portland, New York, Chicago, Houston. *Factories:* SEATTLE, St. Louis, Peoria.

HAND BOOK FREE: "Industrial Wire Ropes" contains useful facts, tables, pictures. Write for your copy.

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Yellow Strand

PREFORMED WIRE ROPE

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FOR THEY KNOW THE WAY !

If you are among the fortunate few and you act at once, you may get one or more of these famous, heavy-duty trucks, now being made in limited quantities for essential commercial hauling. Any Autocar Branch will help you file your application.

Leaders of industry—like the Sun Oil Company—pay the price for the best because they know that true, precision-built quality is cheapest in the long run. Heavy-duty Autocar Trucks are superbly engineered—a fact established by their remarkable day-in-day-out performance. They run longer because they've got what it takes. Power. Stamina. Reliability. They've got what it takes because that's the way they're built. Autocar Trucks are famous for low-cost-per-mile performance, long life, and surer profits.

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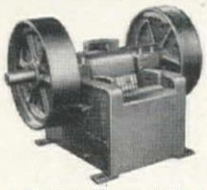
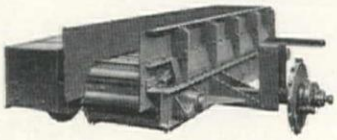


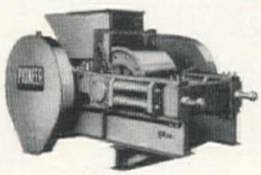
JAW CRUSHERS

Overhead eccentric type for primary crushing. Will handle large material, has downward and forward crushing action. Sturdy design for high tonnage capacity.



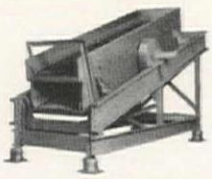
FEEDERS

Regulate flow of material to crushers to assure continuous high production. Medium and heavy duty types, horizontal or inclined; will bypass undersize.



ROLL CRUSHERS

For secondary crushing and fine reduction. Star gears driven by belt and countershaft; manganese shells and anti-friction bearings Delivers large tonnage, accurately sized.

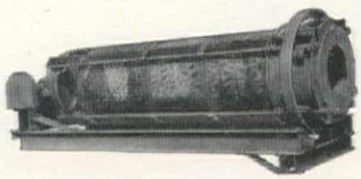


VIBRATOR SCREENS

Positive, uniform agitation. Circular motion for fast, accurate screening. Perfectly balanced, 4 SKF bearings for smooth operation; long life. Sagless, replaceable screens.

BELT CONVEYORS AND ACCESSORIES

Standard sectional, knock-down type, welded lattice frame reinforced. Plain or anti-friction bearings. Straight or troughing idlers; supports and belt tighteners.

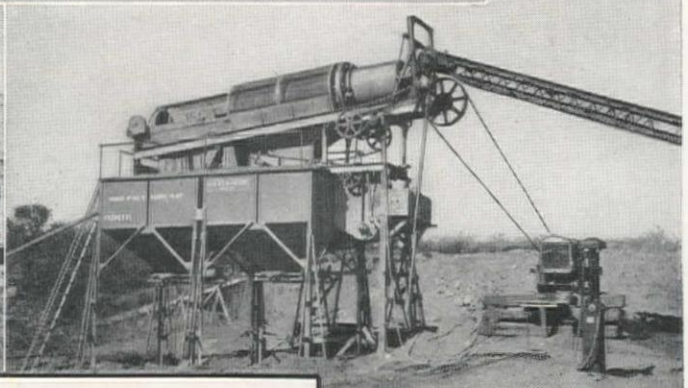


REVOLVING SCREENS

Portable or stationary types, adapted for scalping, washing, scrubbing and sizing, also for dehydrating. Available with spray pipes, conveyors, sand jacket, bins.

Portable Gravel Plants

Have primary and secondary crushers, screen and conveyor. Produce aggregate for road surfacing and other construction. Available in 5 sizes, capacities to 300 t.p.h. Washing and dehydrating equipment optional.



Portable Washing Plants

Washes, screens and dehydrates to produce sand and several sizes of aggregate. Crusher optional. Pioneer also builds portable and stationary quarry plants, as well as travel-mix and central mix bituminous plants.

Pioneer

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ENGINEERS and MANUFACTURERS of QUARRY-GRAVEL AND MINING MACHINERY

Jaw Crushers · Roll Crushers · Screens · Conveyors · Feeders · Washers

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power...

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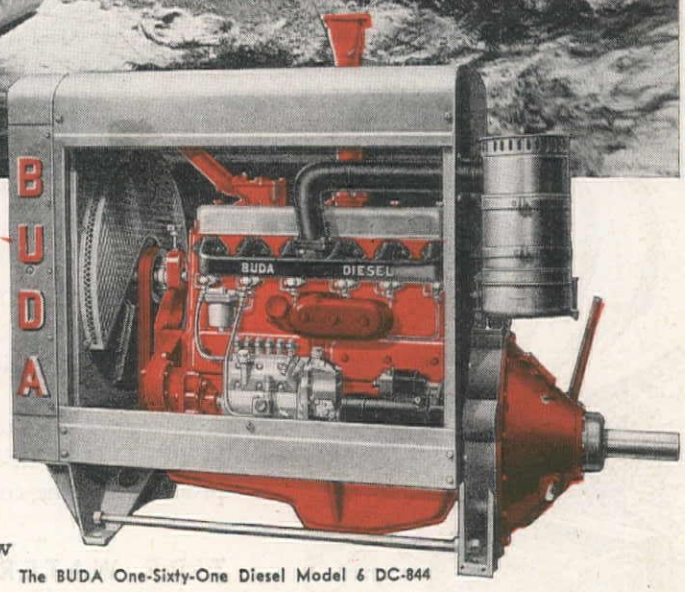
• The demand for "tomorrow's engine today" calls for greater power per size of unit.

There are different ways of increasing the power of an engine—by speeding it up, by increasing combustion pressures . . . but BUDA achieves this goal through *greater piston displacement* with no greater weight or size. Longer life is assured through the low pressure Lanova combustion principle.

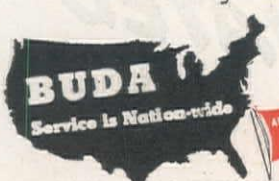


The BUDA One-Sixty-One Diesel Model 6 DC-844

This, like all BUDA improvements, is born of long and wide experience — through 64 successful years of making better equipment to do a better job.

BUDA engines are now available for essential industries. Write or wire today for complete details.

More Horsepower Per Pound and Per Inch!



BUDA Nozzle Testers

BUDA

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HARVEY (Chicago Suburb) ILLINOIS

BUDA "All-Purpose" Jacks

Protect your *"WORK HORSES"* with

VEEDOL SUPER FILM Lubricant "A"

This new Associated super-lubricant was formulated to prolong the life of heavy duty assemblies. Here's how it works: It *remains fluid* throughout its life, for easy starting under all conditions—it *retains its maximum protection qualities* because of its three special additives *(see below)*. Your fleet of dump trucks must stand up under the most gruelling of operating conditions. Veedol Super Film Lubricant "A" can help to keep them hauling—and save expensive repair bills at the same time.

Veedol Super Film Lubricant "A" Contains These Additives:

1 METAL DE-ACTIVATOR: Renders bronze and steel gears in gear housing non-reactive to basic oil and prevents catalytic action, thus reducing rate of metal deterioration.

2 OILINESS AGENT: Provides greater affinity of oil for metal parts under high operating temperatures when thin-film lubrication is encountered.

3 OXIDATION INHIBITOR: Diminishes absorption of oxygen by oil, eliminating thickening and lumping and eventual breakdown of lubrication.

Ask your Associated Representative about revolutionary VEEDOL SUPER FILM LUBRICANT "A" and other specialized Associated products for the construction industries.

TIDE WATER ASSOCIATED OIL COMPANY

LET'S GET ASSOCIATED

☆ VICTORY ☆ ☆ ☆ ☆ ☆
still depends on you

SPECIALIZED AUTOMOTIVE LUBRICANTS FOR EVERY PURPOSE

because it digs, SWINGS, hoists and dumps in ONE continuous movement

Loads Trucks *3 TIMES FASTER*

This all-purpose Loader fills a long-felt need for contractors, highway depts., counties, municipalities, quarries . . . With 180° swinging boom and power-closing bucket it loads to either side in one continuous movement—with 11 fewer clutch moves, in 1/3 the usual time . . . NO MANEUVERING — WORKS IN TIGHT PLACES . . . Crowding power is tremendous — with 65 h.p. engine in ¾ m.p.h. low gear and 80% of load on giant front driving wheels it can dig into any material, backfill, grade, do prime moving and light excavating . . . And with 6 traction speeds and power steering it travels to jobs anywhere at 15 m.p.h.

FLEETFOOT

JAEGER LOADER

CRANE and EXCAVATOR

Sold and Serviced by:

- **EDWARD R. BACON CO.** ..... San Francisco 10, Calif.
- **CONNELLY MACHINERY CO.** .. Billings, Great Falls, Mont.
- **WESTERN MACHINERY COMPANY** .. Salt Lake City, Utah
- **SMITH BOOTH USHER CO.** ..... Los Angeles 54, Calif., and Phoenix, Ariz.
- **A. H. COX & CO.** ..... Seattle 4, Wash.
- **TRACTOR & EQUIPMENT CO.** ..... Sidney, Mont.
- **WORTHAM MACHINERY CO.** ..... Cheyenne, Wyo.
- **NELSON EQUIPMENT CO.** ..... Portland 14, Ore., Spokane, Wash., Twin Falls, Ida.

½ to 2 Yd. Buckets, Quickly Interchangeable—Handle Any Material from Rock to Snow

Can Dig Outside Its Wheels . . Can Dig 3 Ft. Below Grade

1. BIGGER TRUCK LOADS

Right from the start, easy-to-handle Transite Pipe begins to pay off. Its light weight means more footage carried per truck load . . . lower transportation costs.

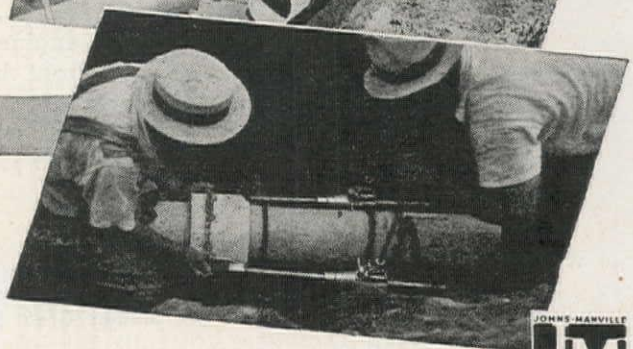
2. SMALLER CREWS

On the job, it takes fewer men to handle Transite Pipe, and smaller installation crews mean lower installation costs. Mechanical handling equipment is not necessary except for the larger sizes.

3. FASTER ASSEMBLY

In the trench, Transite Pipe is assembled easily, quickly, even by unskilled crews. Its exclusive Simplex Coupling assures tight joints, even when the line is deflected as much as 5° at each joint.

And in service, Transite Pipe pays off in efficient, dependable water transportation. Made of asbestos and cement, this non-metallic pipe is immune to tuberculation, highly resistant to soil corrosion. Its low maintenance has been proved in thousands of installations.



Johns-Manville

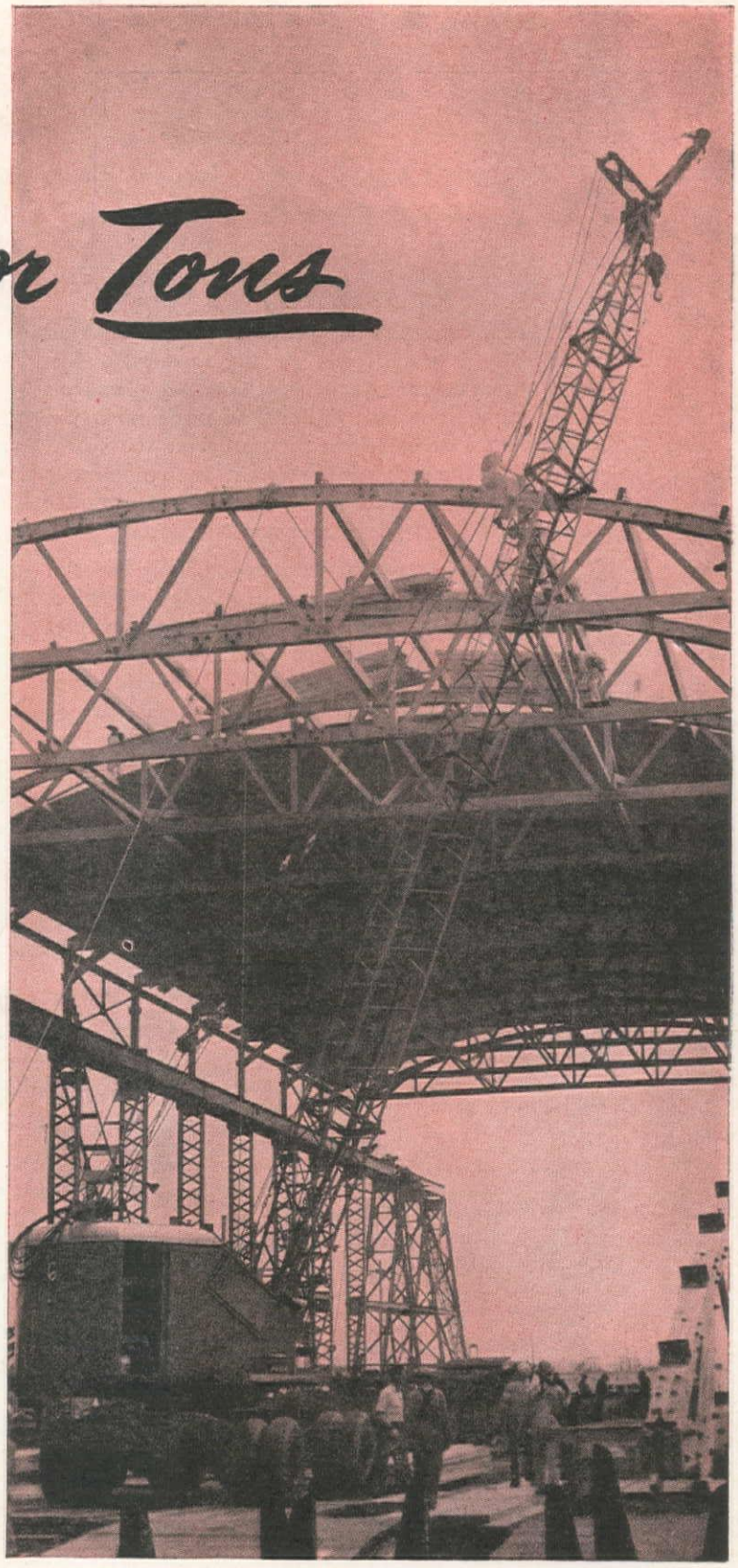
22 EAST 40TH STREET, NEW YORK 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

TRANSITE PIPE

FOR EFFICIENT, ECONOMICAL WATER TRANSPORTATION

Pounds... or Tons



PIERCE GOVERNORS MATCH THE POWER TO THE LOAD

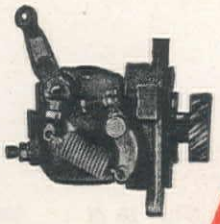
● The governor has to be completely dependable if high efficiency is to be gained in the operation of a crane or shovel. Constant engine speed must be held—despite the fact that the load is varying continually —and widely.

Pierce Governors provide unfailing, positive regulation—whether the load is the boom alone—or tons of weight to be moved. This is the kind of governing that has made Pierce Precision Flyball Governors standard equipment on many of the world's finest engines—gas, gasoline and diesel.

Pierce Governors employ the time-proved centrifugal principle to insure unsurpassed performance in speed control—and long, trouble-free service. They frequently outlast the engines themselves.

Specify Pierce on the new equipment you'll be buying—and write for full information and the Pierce catalog if your engines are not Pierce-equipped.

THE PIERCE GOVERNOR COMPANY, INC.
1645 OHIO AVENUE • ANDERSON, INDIANA
Manufacturers of
Pierce Precision Governors and Sisson Automatic Chokes



PIERCE GOVERNORS

Why Cast Iron Pipe is for underground mains

For twenty centuries engineers have experimented with many pipe materials for underground mains. About three centuries ago a new material—cast iron—first came into use. From then until now, the performance of cast iron pipe all over the world has made it the recognized *standard* by which other materials might well be measured, when under consideration for permanent construction.

This is so because of the proved long life and proved low cost of maintenance of cast iron pipe. Evidence of long life is supplied by cast iron lines still functioning in Europe after more than 200 years of service, and in England and America after more than 100 years of continuous satisfactory performance. Evidence of lowest cost of maintenance is found in comparative cost records supplied by Water Works Superintendents of 195 cities. For such reasons, more than 95 per cent of the pipe in the water distribution systems of America is cast iron pipe. Some, or all, of the *original* cast iron water mains are still in service in 200 out of 212 of America's largest cities.

Such evidence breeds trust and confidence. For example, where buried pipe is hard to get at for repairs or replacements, as in sewage treatment plants, more than 95% of all pipe installed is cast iron pipe. Long life saves the taxpayer money. In a depreciation study, by a Government department, of hundreds of materials and products, cast iron pipe is given the lowest rate of depreciation.

So we say, "Trust the pipe you know about." When you are tempted to experiment, remember that cast iron pipe is the recognized standard material for well-founded reasons – reasons which are disregarded only at the risk of ultimate higher cost to taxpayers.

Address inquiries to Cast Iron Pipe Research Association. Thomas F. Wolfe, Research Engineer, Peoples Gas Building, Chicago 3, Ill.

THE 10 REQUIREMENTS FOR UNDERGROUND MAINS

LONG LIFE: In evaluating bids, the useful life of cast iron pipe is 100 years minimum.

FLOW CAPACITY: Under normal conditions, the flow capacity of cast iron pipe remains practically unimpaired for centuries. For certain areas where active water is encountered, cement-lined cast iron pipe is available. Under such conditions, no other material offers the combined long life and sustained flow capacity of lined cast iron pipe.

TIGHT JOINTS: For ordinary pressures, cast iron bell-and-spigot pipe—for high pressures, cast iron mechanical joint pipe—are known to be leak-proof.

TENSILE STRENGTH: Standard cast iron pipe ranges from 23,000 to 30,000 pounds per square inch.

BEAM STRENGTH: Standard six-inch cast iron pipe bears up under a load of 17,500 pounds and bends approximately 1½ inches before breaking.

TOUGHNESS: Under hydrostatic pressure and the impact of a 50 lb. hammer, ordinary cast iron pipe does not crack until the hammer is dropped four feet (beginning at one foot with one-foot increases).

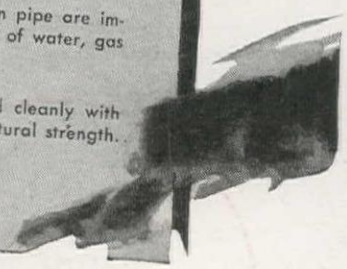
INTERNAL PRESSURE: Standard six-inch cast iron pipe withstands more than 2,500 pounds pressure per square inch.

EXTERNAL PRESSURE: A 12-inch section of standard six-inch cast iron pipe withstands a crushing weight of 14,000 pounds.

IMPERVIOUSNESS: The walls of cast iron pipe are impervious to leakage, seepage or sweating of water, gas or chemicals under internal pressure tests.

TAPPING: Cast iron pipe can be tapped cleanly with strong, tough threads, losing little in structural strength.

Other pipe materials meet some of these requirements but only cast iron pipe meets them all.



Trust the pipe you know about

CAST IRON PIPE

the Standard Material

SERVES FOR CENTURIES

"THAT DRUM WEARS A SHOCKPROOF GIRDLE!"

"You can take it from me," said a well known Rex Moto-Mixer fleet operator — "Rex has really got something in that shockproof girdle—the Chain Belt Drive that goes completely around the drum of a Rex Moto-Mixer."

Road shocks, strains of sudden stops and starts with a loaded drum are cushioned by this flexible drive . . . are not passed on to transmission, power plant and other vital working parts.

But the chain belt drive isn't the only outstanding feature. For example, there's the new exclusive mixing action that enables Rex Moto-Mixers to mix low slump concrete . . . fast! New easy-to-replace mixing blades are bolted, not welded, to the drum. Patented method of water entry introduces water behind the blades right where the actual mixing action takes place.

Rex Hi-Discharge Moto-Mixers have been consistently improved, but the basic design has remained unchanged because it was *right*—from the start!

Rely on your Rex Distributor. See him for pumps, pavers, mixers, Pumpcretes and Moto-Mixers.

Arnold Machinery Co., Salt Lake City, Utah; Brown-Bevis Equipment Co., Los Angeles, California; Brown-Bevis Equipment Co., Phoenix, Arizona; Construction Equipment Co., Spokane, Washington; Contractors Equipment and Supply Co., Albuquerque, New Mexico; Corson Machinery Co., Ray—Denver, Colorado; Hall-Perry Machinery Co., Butte, Montana; Intermountain Equipment Co., Boise, Idaho; Loggers & Contractors Machinery Co., Portland, Oregon; Star Machinery Co., Seattle, Washington; Industrial Equipment Company, Emeryville, California.

REX

CONSTRUCTION MACHINERY

PUMPS PAVERS PUMPCRETES MOTO-MIXERS MIXERS

Preformed wire rope

MULTIPLIES MANPOWER 3 WAYS

Men who actually work with wire rope prefer preformed. They give many different reasons for this choice, but the net result is more work per line before replacement.

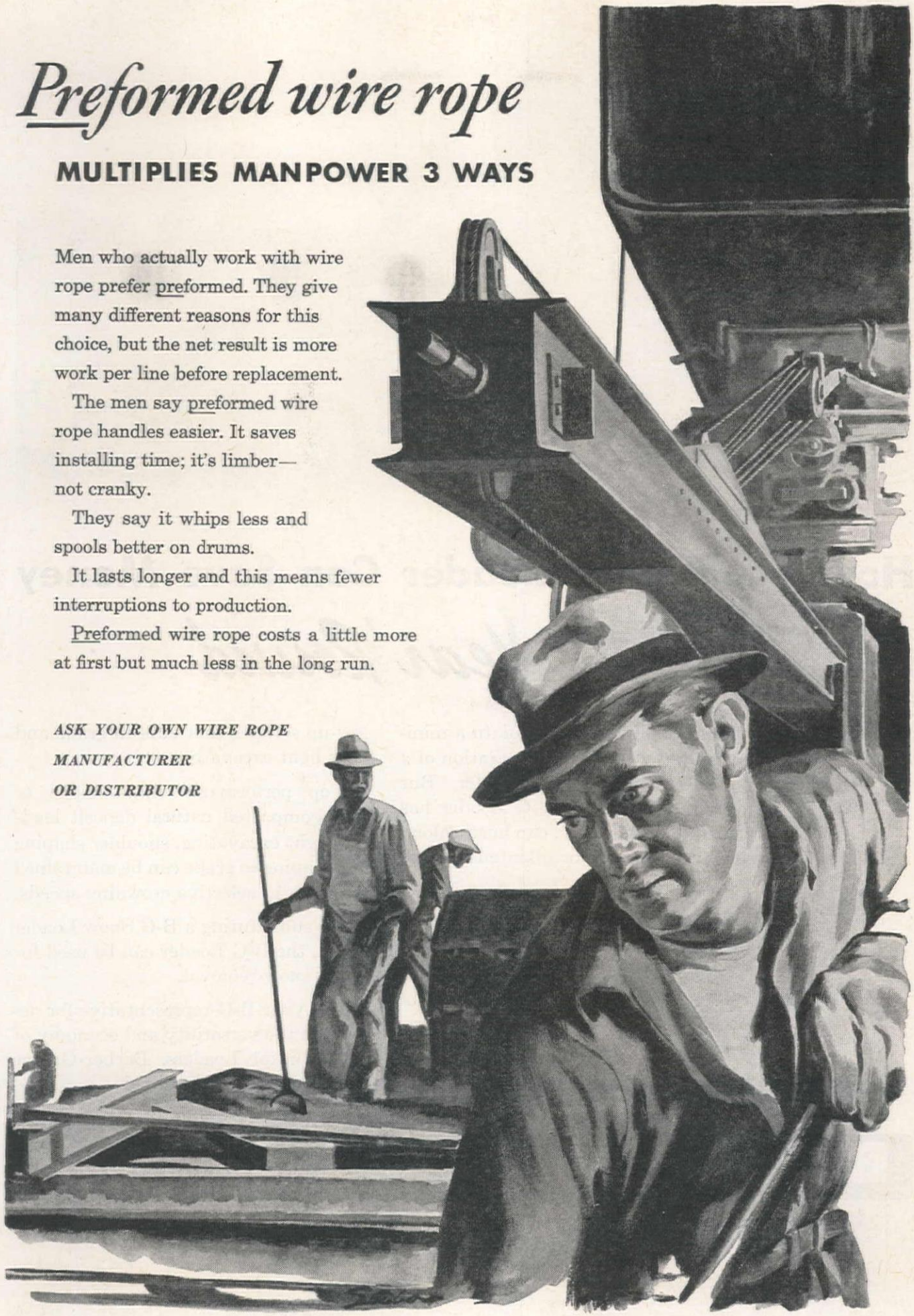
The men say preformed wire rope handles easier. It saves installing time; it's limber—not cranky.

They say it whips less and spools better on drums.

It lasts longer and this means fewer interruptions to production.

Preformed wire rope costs a little more at first but much less in the long run.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR



How a B-G Bucket Loader Can Save Money *the Year 'Round*

• Truck loading time is cut to a minimum by the continuous operation of a Barber-Greene Bucket Loader. But more than that, the B-G Loader has year-round utility . . . can hustle along some construction or maintenance job each season.

★ The B-G Loader yields higher yardage, with less power, less weight, and less cost than any other method.

★ It can effectively handle a variety of loose materials—soil, sand, cinders, gravel or roadway debris.

★ Clean pick-up is assured with the follow-up scraper that cuts to grade and does light excavating.

★ Top performance in stockpile or semi-compacted natural deposit loading, light excavating, shoulder shaping or stripping to grade can be maintained with the 12 selective crowding speeds.

★ By substituting a B-G Snow Loader boom, the B-G Loader can be used for street snow removal.

Ask your B-G representative for details on the versatility and economy of B-G Bucket Loaders. Barber-Greene Company, Aurora, Illinois.

45-3

Barber-Greene *Constant Flow Equipment*

Brown-Bevis Equip. Co., Los Angeles, Phoenix; Columbia Equip. Co., Portland, Spokane, Seattle, Boise; Contractors Equip. & Supply Co., Albuquerque; Jenison Machinery Co., San Francisco; Lund Machinery Co., Salt Lake City; Western Construction Equip. Co., Billings; Ray Corson Machinery Co., Denver.

ENGINEERED PIPE HANGERS

for
any piping *anywhere*

For any piping installation, from a simple water pipe to a high pressure, high temperature steam line, there is a stock Grinnell Hanger.

Grinnell Hangers will save you valuable engineering time and assure:

Faster Installation

Easy Adjustment during and after pipe erection

Full Provision for thermal movement

Easy Maintenance

Compliance with all piping code requirements

Don't try to get by with makeshift or unreliable hangers – call on Grinnell for engineered hangers to meet your requirements exactly.

GRINNELL COMPANY, INC.
EXECUTIVE OFFICES, PROVIDENCE 1, R. I.

BRANCH WAREHOUSES

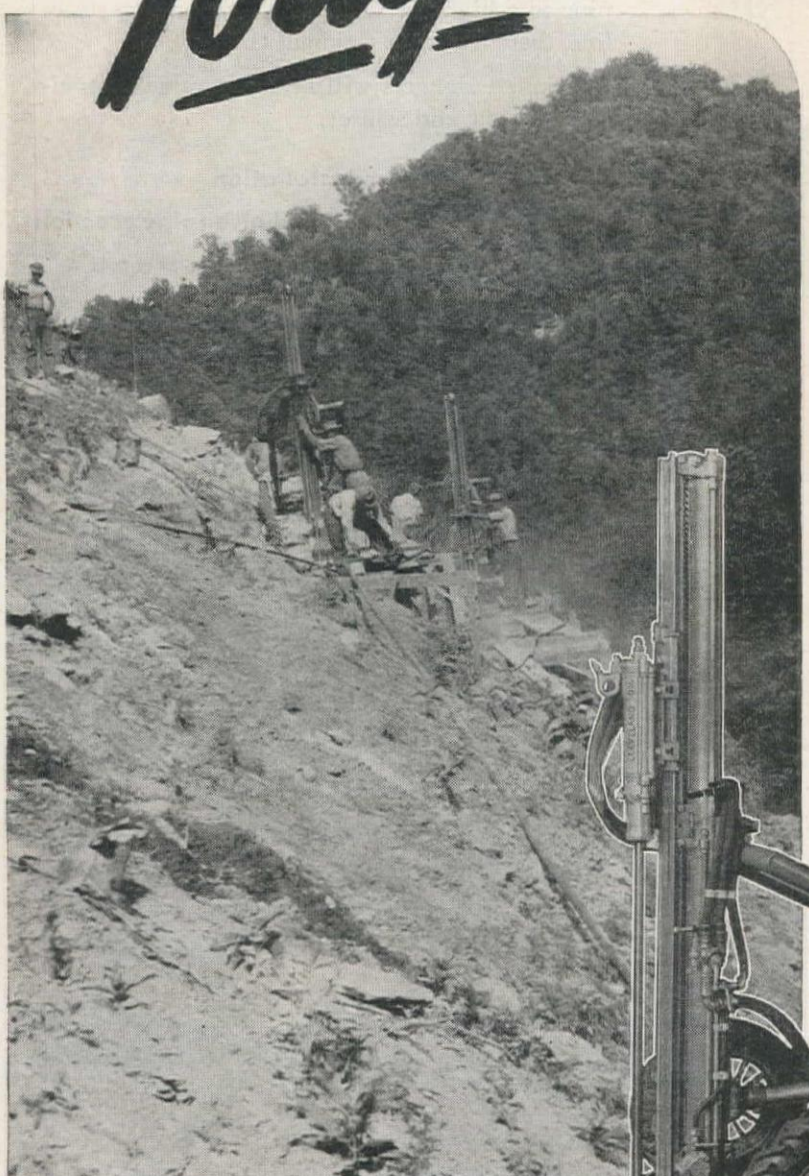
ATLANTA 2, GA.	LOS ANGELES 13, CAL.	PROVIDENCE 1, R. I.
CHARLOTTE 1, N. C.	MINNEAPOLIS 15, MINN.	ST. LOUIS 10. MO.
CHICAGO 9, ILL.	NEW YORK 17, N. Y.	ST. PAUL, MINN.
CLEVELAND 14, O.	OAKLAND 7, CAL.	SAN FRANCISCO 7, CAL.
HOUSTON 1, TEX.	PHILADELPHIA 34, PA.	SEATTLE 1, WASH.

GRINNELL

WHENEVER PIPING IS INVOLVED

Tough Terrain!

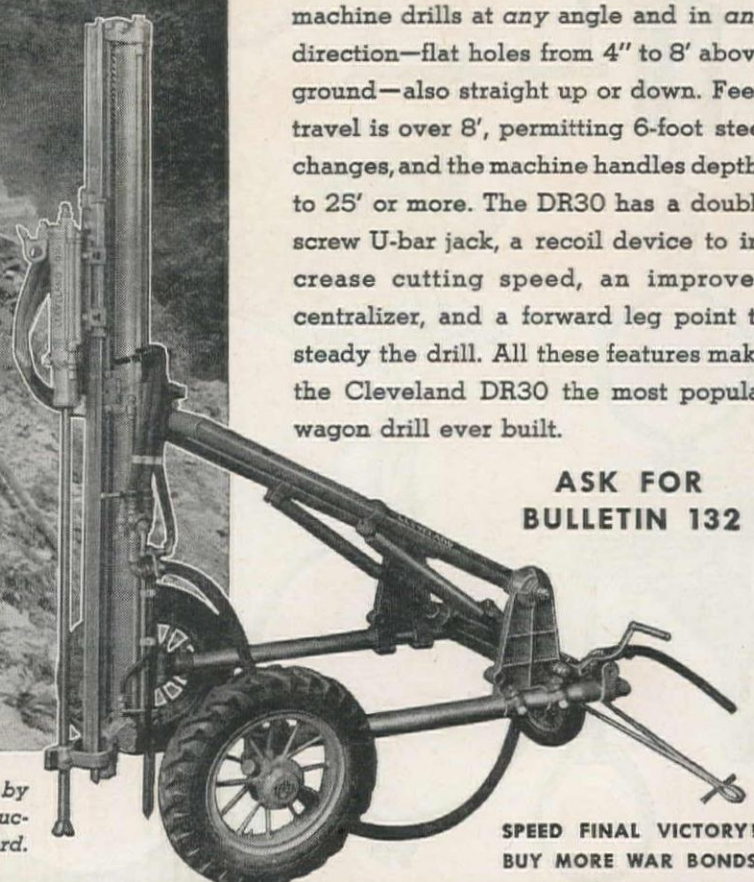
But NOT too tough for CLEVELAND Wagon Drills!



● The mountain side is so steep on this road-building job that the wagon drills must be held with ropes. Yet even under such difficult conditions the Cleveland DR30 proves its mettle.

As this picture indicates, the DR30 is unsurpassed in maneuverability. The machine drills at *any* angle and in *any* direction—flat holes from 4" to 8' above ground—also straight up or down. Feed travel is over 8', permitting 6-foot steel changes, and the machine handles depths to 25' or more. The DR30 has a double screw U-bar jack, a recoil device to increase cutting speed, an improved centralizer, and a forward leg point to steady the drill. All these features make the Cleveland DR30 the most popular wagon drill ever built.

ASK FOR BULLETIN 132



Pneumatic tires now obtainable if specified by purchaser in his application for priority to Construction Machinery Branch of War Production Board.

SPEED FINAL VICTORY!
BUY MORE WAR BONDS

LEADERS IN DRILLING EQUIPMENT

WESTERN BRANCHES

San Francisco, Calif. 582 Sixth Street
Butte, Montana 41 East Broadway
Wallace, Idaho 515 Bank Street
El Paso, Texas 1225 Texas St.
Salt Lake City, Utah 65 W. Fourth South St.
Los Angeles, Calif. 3817 Santa Fe Ave.

DISTRIBUTORS

THE RIX COMPANY, INC. San Francisco 3, Calif.
LeROI-RIX MACHINERY CO. Los Angeles 11, Calif.
NELSON EQUIPMENT CO. Portland, Oregon
A. H. COX CO., INC. Seattle, Washington

THE CLEVELAND ROCK DRILL CO.
DIVISION OF THE CLEVELAND PNEUMATIC TOOL COMPANY
CABLE ADDRESS: "ROCKDRILL" • CLEVELAND 5, OHIO

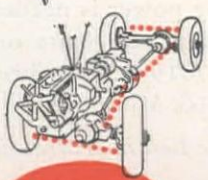
FWDs MAKE THE MOST OF *Truck* POWER AND *Man* POWER

In everyday duty on highway construction and maintenance, FWDs regularly do 61 jobs. Including special jobs, there are more . . . write for list. For all year 'round highway work, you can always depend on FWDs.

FWD trucks . . . rugged, reliable, modern . . . embody the highest development of the original four-wheel-drive principle, pioneered and advanced by FWD since 1910. The true FWD principle with center differential and properly balanced power on all wheels, gives these trucks outstanding mechanical advantages and highway performance leadership . . . the FWD principle that provides the power and stamina to get through, regardless of weather, road conditions, or lack of roads, with greater assurance and safety. Balanced weight distribution on all four wheels conserves precious tires, replacements, oil and gas.

As leaders in performance, economy and style, FWDs are a great "buy" for highway service. Their value is so widely recognized that they outnumber all other four-wheel-drives 4 to 1 in this field of heavy-duty truck work.

THE FOUR WHEEL DRIVE AUTO COMPANY, Clintonville, Wisconsin
Canadian Factory: Kitchener, Ontario



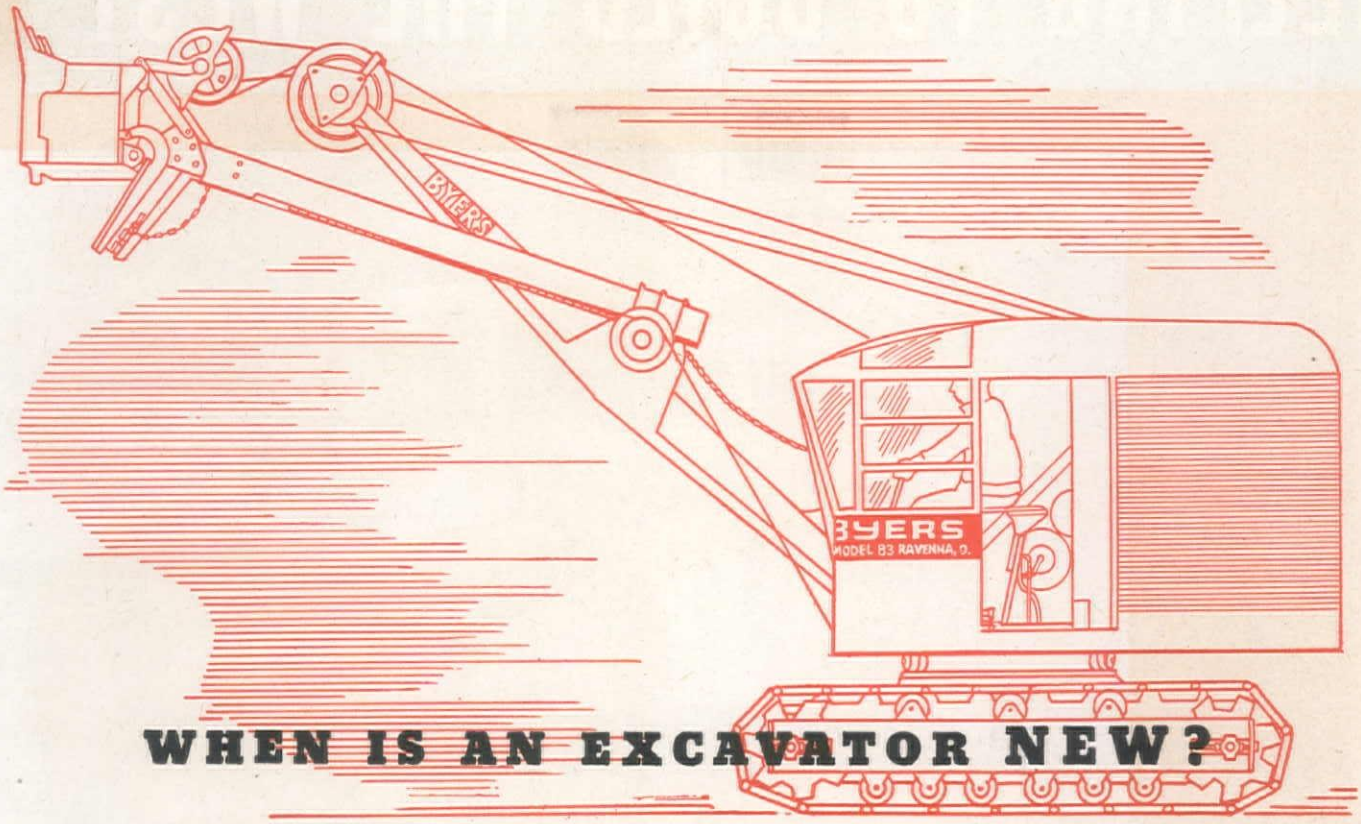
FWD TRUCKS

THE ORIGINAL EXCLUSIVE BUILDERS OF FOUR-WHEEL-DRIVE TRUCKS

More than $75,000,000 in purchases of FWD Model SU alone in the comparatively short span of forty-eight months, emphasizes FWD leadership in this field!

FWD Distributors

ARIZONA—Arizona-Cedar Rapids Co., 401 N. First St., Phoenix; CALIFORNIA—Hillman-Kelley Company, 1000 Macey St., Los Angeles and FWD Pacific Co., 469 Bryant St., San Francisco 7; COLORADO—Liberty Trucks & Parts Co., P. O. Box 1889, Denver 1; IDAHO—Intermountain Equipment Company, Broadway at Myrtle St., Boise; MONTANA—Steffeck Equipment Co., 11 E. Cutler St., Helena; NEVADA—Allied Equipment Co., Reno; NEW MEXICO—The Myers Company, Las Cruces; OKLAHOMA—Halliburton Oil Well Cementing Co., P. O. Drawer 471, Duncan and Oklahoma Road Mach. Co., Muskogee; OREGON— Feenaughty Machinery Co., 712 S. E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th So., Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 6th Ave., So., Seattle 2, and Feenaughty Machinery Co., 715 N. Division St., Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne.



WHEN IS AN EXCAVATOR NEW?

WHEN WPB Order L-192 is amended or rescinded to permit resumption of normal commercial sale of shovels and cranes, Byers will offer the construction industry a line of new and greatly improved excavators.

In capacities from ⅜ through 1 cu. yd., the Byers postwar line has been built up to provide excavator performance such as will be required in an era of high operating costs, competitive bidding and narrow margins, where profit depends principally on the use of profit-earning equipment.

The only model in Byers present wartime line which will be offered for postwar sale is the reliable ¾ yd. Byers Model 83 . . . and it is undergoing engineering improvements to help it exceed its remarkable prewar performance records.

All other models will be "new" to most private contractors and political purchasers because they will not have seen them before. But they will no longer be "new" to war contractors and government agencies who will have used them on severe wartime service. It is from this world-wide proving ground that Byers engineers are now checking performance, wear and maintenance to assure you of thoroughly tested, proved and approved new shovels and cranes you will be eager to own and use.

For full information, contact the Byers distributor near you.

THE BYERS MACHINE CO.

★ Ravenna, Ohio ★

Distributed throughout the World

Your Local Byers Distributor Is: **EDWARD R. BACON CO., San Francisco; NELSON EQUIPMENT CO., Portland & Seattle Offices; HARRIS AUTO & PARTS CO., Denver; WILLARD EQUIPMENT, LTD., Vancouver, B. C.**

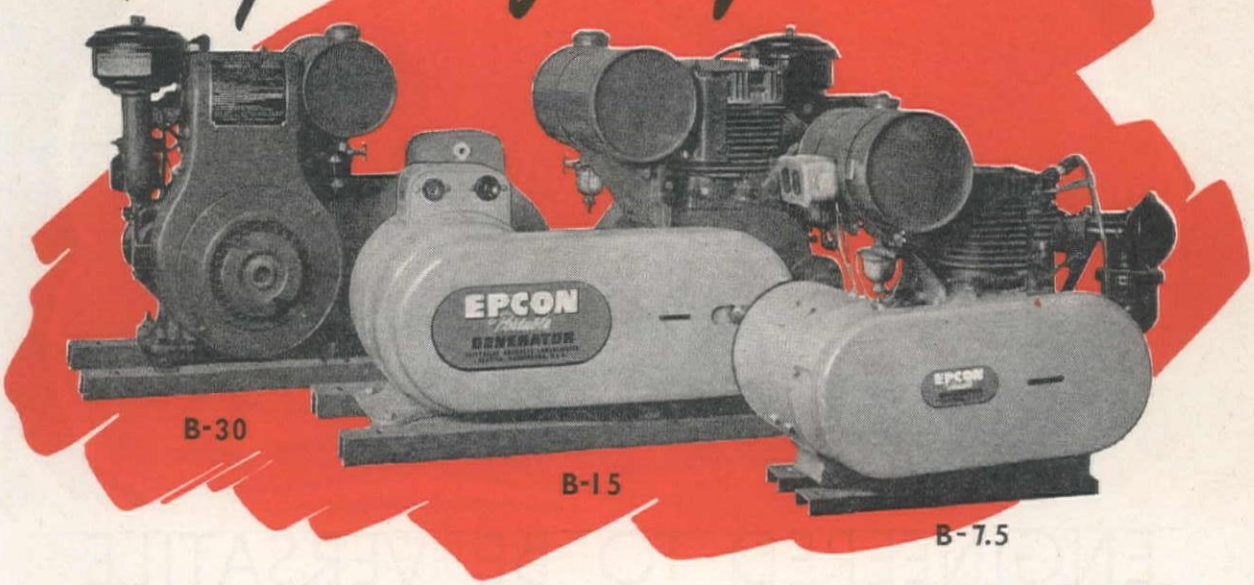
HELPING TO BUILD THE WEST

● In the construction of many a famous West Coast landmark, **PETERBILT TRUCKS** were much in evidence. Today, as hundreds of motorists park their automobiles in San Francisco's famous Union Square Garage, few of them realize how many thousands of cubic yards of soil had to be excavated and hauled away to make room for the four floors of this garage, which takes 1700 automobiles off the streets of San Francisco. ☆ Piombo Bros. & Co., who did the excavating, found **PETERBILT TRUCKS** ideal for handling a big job quickly. When you have a big job on hand or in prospect, investigate **PETERBILT TRUCKS.**

Peterbilt Motors Company

107th AVENUE AND HOLLYWOOD BOULEVARD · OAKLAND · CALIFOR

Three Stalwart Helpers for You



When you need portable electric power you *really need it*. In a portable electric generator you want sturdy construction, lightness of weight, efficient and consistent operation. Designed to fit *your needs*. Epcon generators meet the severest tests and have proved their worth.

Whatever your problem — investigate Epcon first. Write today for full information, specifications and address of the Epcon dealer nearest you.

Epcon B-30

Conservative capacity 3000 watts. 60 cycle at 1800 R.P.M. 110 volt alternating current single-phase. Windings impregnated by special process and baked to thoroughly insulate and render them moisture and oil resistant. Four pole field arrangement. V-belt drive. 49 bar large mica insulated commutator. Lateral type collector rings. Double-sealed lifetime ball bearings. Large cooling fan. Iron base with rubber shocks. Powered by Briggs & Stratton 6 horsepower aircooled gas engine. Net weight 360 lbs. Price $475.00 (generator only, $322.00).

Epcon B-15

Conservative capacity 1500 watts. 60 cycle at 1800 R.P.M. 110 volt alternating current single-phase. Windings impregnated by special process and baked to thoroughly insulate and render them moisture and oil resistant. Four pole field arrangement. V-belt drive. 49 bar large mica insulated commutator. Lateral type collector rings. Double-sealed lifetime ball bearings. Large cooling fan. Iron base with rubber shocks. Powered by Briggs & Stratton 2¾ horsepower air-cooled gas engine. Net weight 225 lbs. Price $375.00 (generator only, $249.20).

Epcon B-7.5

Conservative capacity 750 watts. 60 cycle at 1800 R.P.M. 110 volt alternating current single-phase. Windings impregnated by special process and baked to thoroughly insulate and render them moisture and oil resistant. Four pole field arrangement. V-belt drive. Large mica insulated commutator. Lateral type collector rings. Double-sealed lifetime ball bearings. Large cooling fan. Iron base with rubber shocks. Powered by Briggs & Stratton 1¾ horsepower air-cooled gas engine. Net weight 145 lbs. Price $265.00 (generator only, $175.00).

It's EPCON for
- Boats
- Camps
- Power Tools
- Construction
- Sound Trucks
- Flood Lighting
- Battery Charging
- Standby Operation

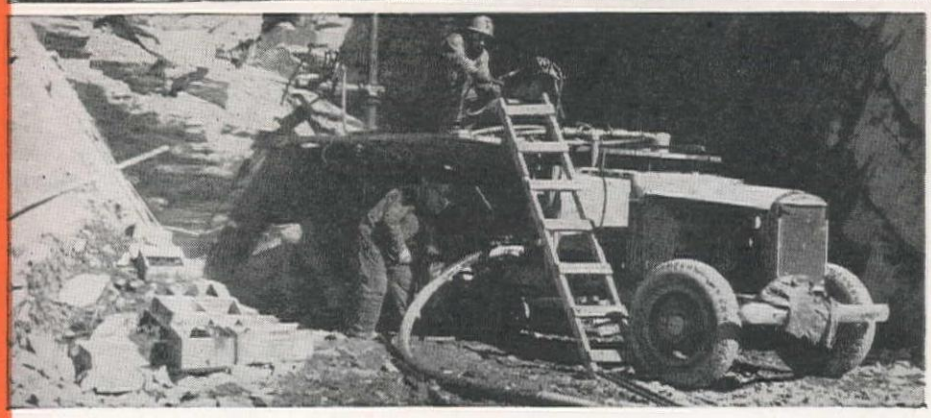
For Power Where You Need It—

EPCON PORTABLE GENERATORS

ELECTRICAL PRODUCTS CONSOLIDATED

1016 VIRGINIA STREET
SEATTLE 11, WASHINGTON

TIMKEN ROCK BITS used 100% on important ALASKA ROAD JOB



When the Alaska Road Commission, U. S. Department Of The Interior, decided to improve the Fairbanks-Valdez road —one of the most important in the country, they were faced with a considerable tunneling job in Keystone Canyon — mostly through solid rock.

Ever alert to modern methods and equipment, the Commission selected Timken "M" Type Bits for the job. No other bits were used. The rock encountered was medium hard.

By using Timken Bits drilling was handled with minimum manpower, and nipping and transportation practically eliminated.

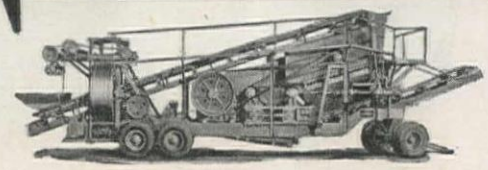
As usual, Timken "M" Type Bits delivered good footage and reduced drilling costs all around. Any rock drilling job can be done better, quicker, at lower cost with Timken Rock Bits. Are you using them? If not, your drilling may be costing you more than it should. Swing to Timken Removable Rock Bits and watch your drilling costs drop. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

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

ROCK BITS

This 7 YEAR OLD DIAMOND . . . licked a tough schedule



Seven years by no means sets a record for DIAMOND endurance. But this photograph shows a DIAMOND Portable (saucer type) Rotor-Lift Plant still meeting an exacting schedule with a high output of railroad ballast in Washington and Oregon during 1944—after seven tough, high pressure years of service.

Veteran operators—who have seen DIAMOND equipment operating over the years—are our best salesmen. They know the DIAMOND plant has NO bottlenecks—no overloads on the screen or crushers because the Rotor-Lift distributes crushed oversize EVENLY on to the main conveyor which feeds to the top deck of the screen. Vibrator, jaw crusher, roll crusher, conveyors—all are designed for high output, ruggedly built to run and Run and RUN. THERE'S NOTHING TOUGHER THAN A DIAMOND!

Let our engineers show you how DIAMOND equipment can produce for you on a low-cost-per-ton basis. Write to us, or contact one of these DIAMOND dealers.

FREE
Write for Gravel Plant Bulletin D-43-G.

Quarry Products Bearing the Famous DIAMOND Label . . .

Jaw Crushers . . . Roll Crushers . . . Hammermills . . . Screens . . . Conveyors . . . Bins . . . Feeders . . . Portable and Stationary Plants.

Ask for our Quarry Plant Bulletin D-45-A

DIAMOND DEALERS

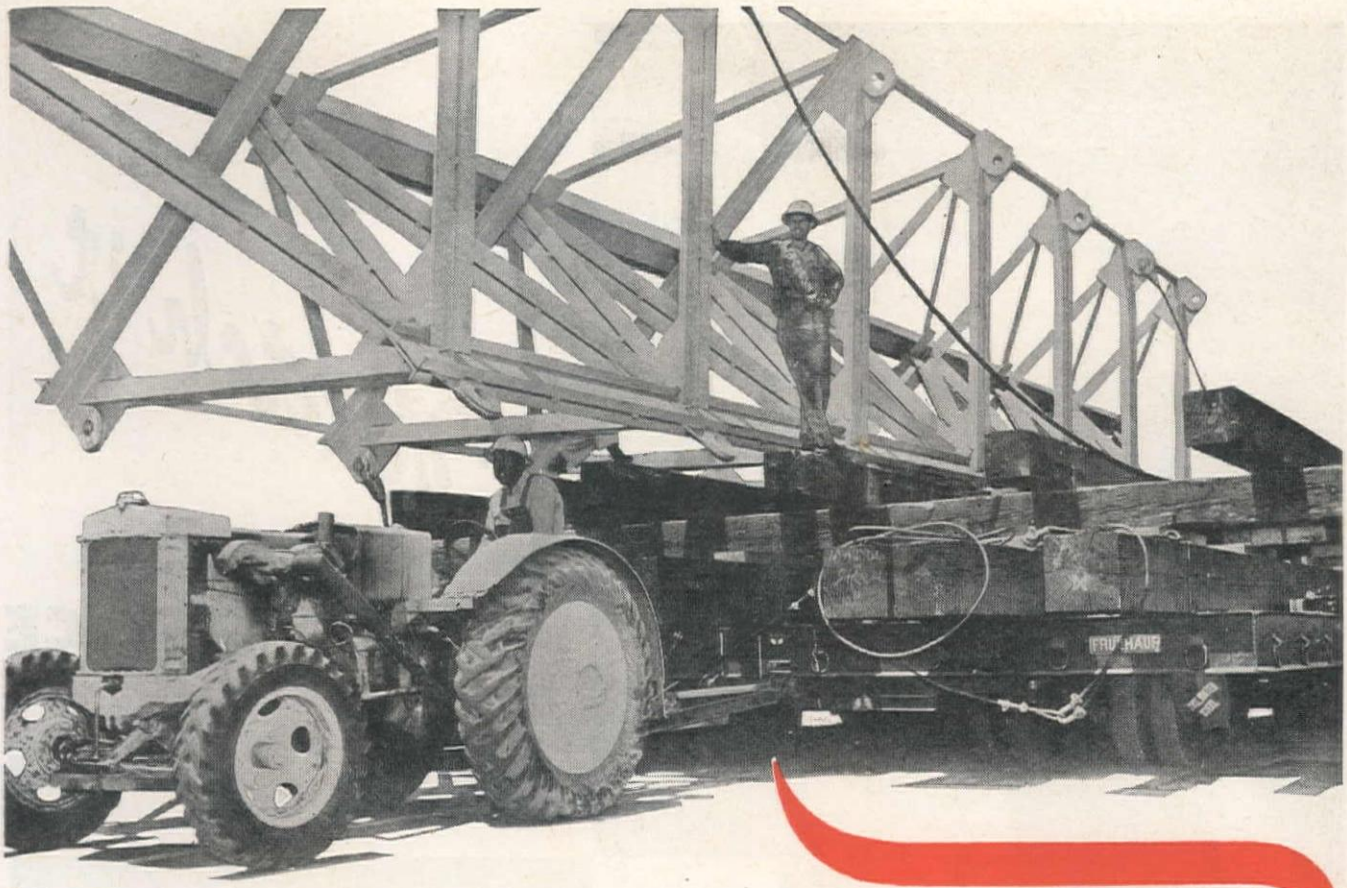
Oakland	SOULÉ EQUIP. CO.
Los Angeles	GARLINGHOUSE BROS.
Seattle	A. H. COX & CO.
Portland	LOGGERS & CONTRACT'S MACH. CO.
Boise	WESTERN EQUIP. CO.
Salt Lake City	C. H. JONES EQUIP. CO.
Phoenix	O. S. STAPLEY CO.
Albuquerque	CONTRACTORS' EQUIP. & SUP. CO.

DIAMOND

DIAMOND IRON WORKS, INC.

AND THE MAHR MANUFACTURING CO. DIVISION

1818 SECOND STREET NORTH MINNEAPOLIS 11, MINNESOTA



Toting Sixty-Six Clumsy Tons

HOW huge and ungainly is this ship superstructure you can see by how far it overhangs the special 32-wheel Fruehauf trailer, which is 24 feet wide and 32 feet long. At that, the spidery 66 tons is little over half the trailer's maximum capacity of 125 tons.

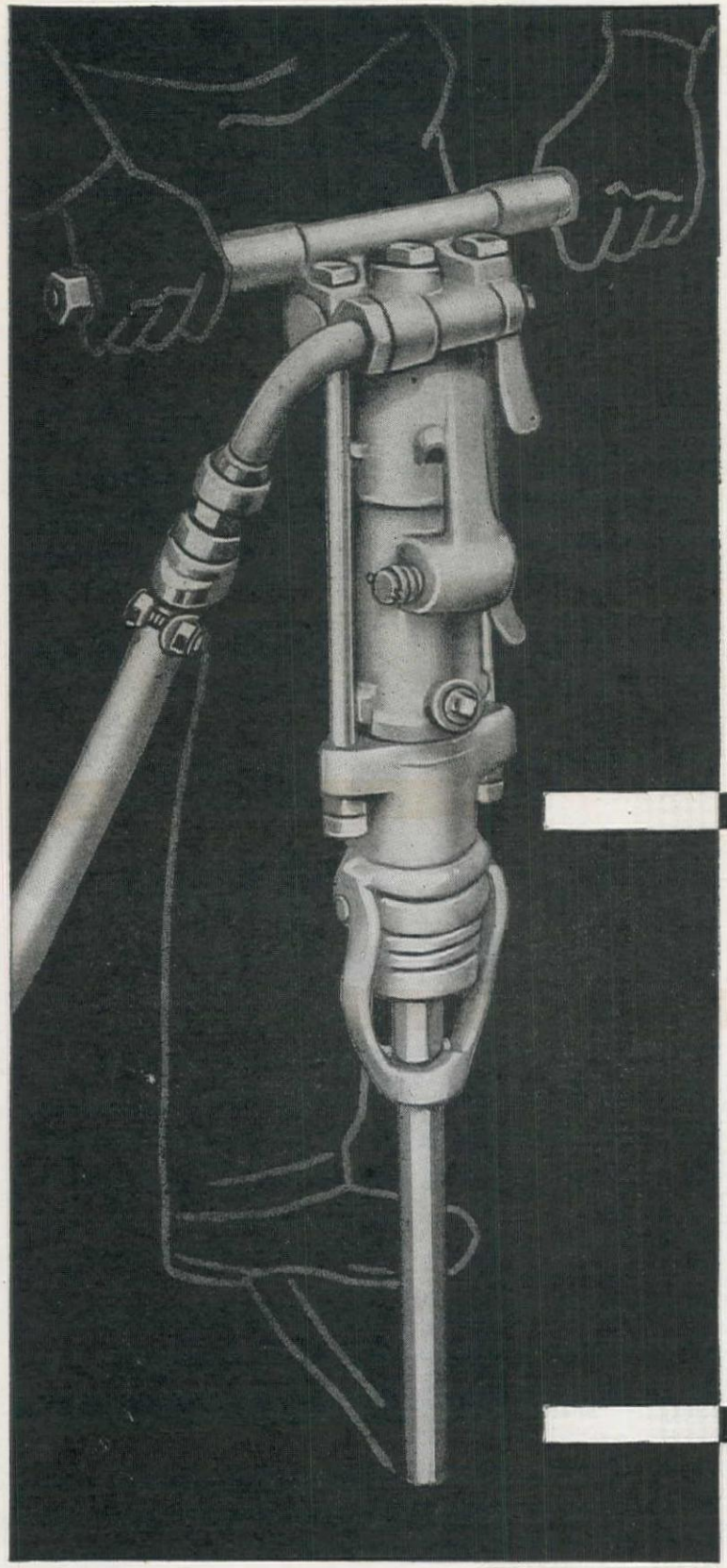
Starting from stand-still with such ponderous dead-weight puts the spotlight on two features of Case heavy-duty industrial tractors. One is a special method of lubricating the clutch which gives gradual, velvety engagement against stubborn resistance, and at the same time greatly reduces wear on the clutch facings. The other is "lugging" ability of Case valve-in-head engines. Giving their strongest pull when slowed down almost to half-speed, they do away with need for prolonged clutch slippage.

Safe, sure-footed handling of critical loads grossing above a hundred tons with a veteran tractor weighing only about five tons tells its own story of the dependability and endurance built into Case industrial tractors. Their extra endurance comes mainly by making every part a bit better than might seem necessary, plus extra care in providing means to keep out destructive dirt. Knowing how to build them that way comes from 75 years of experience in putting engine power to work at rugged outdoor jobs.

There are four basic sizes of Case industrial tractors, with varied wheel and tire equipment to cover an unbroken weight range from 2500 to more than 10,000 pounds. Ask your Case distributor for full information, including availability. J. I. Case Co., Oakland, Los Angeles.

IN BUSINESS TO SERVE YOU WELL. Your Case industrial distributor is organized and equipped to render complete and competent service. He can give you counsel, based on experience in conditions similar to your own, regarding the choice of equipment. He offers not only Case tractors but tractor-mounted cranes, loaders, winches, mowers, rotary brushes, snow plows, etc., all engineered for team-work with Case power. He backs up the lines he sells with stocks of service parts, shop equipment and trained personnel.

CASE ★ ★ ★



Watch it

SET THE PACE FOR ITS CLASS

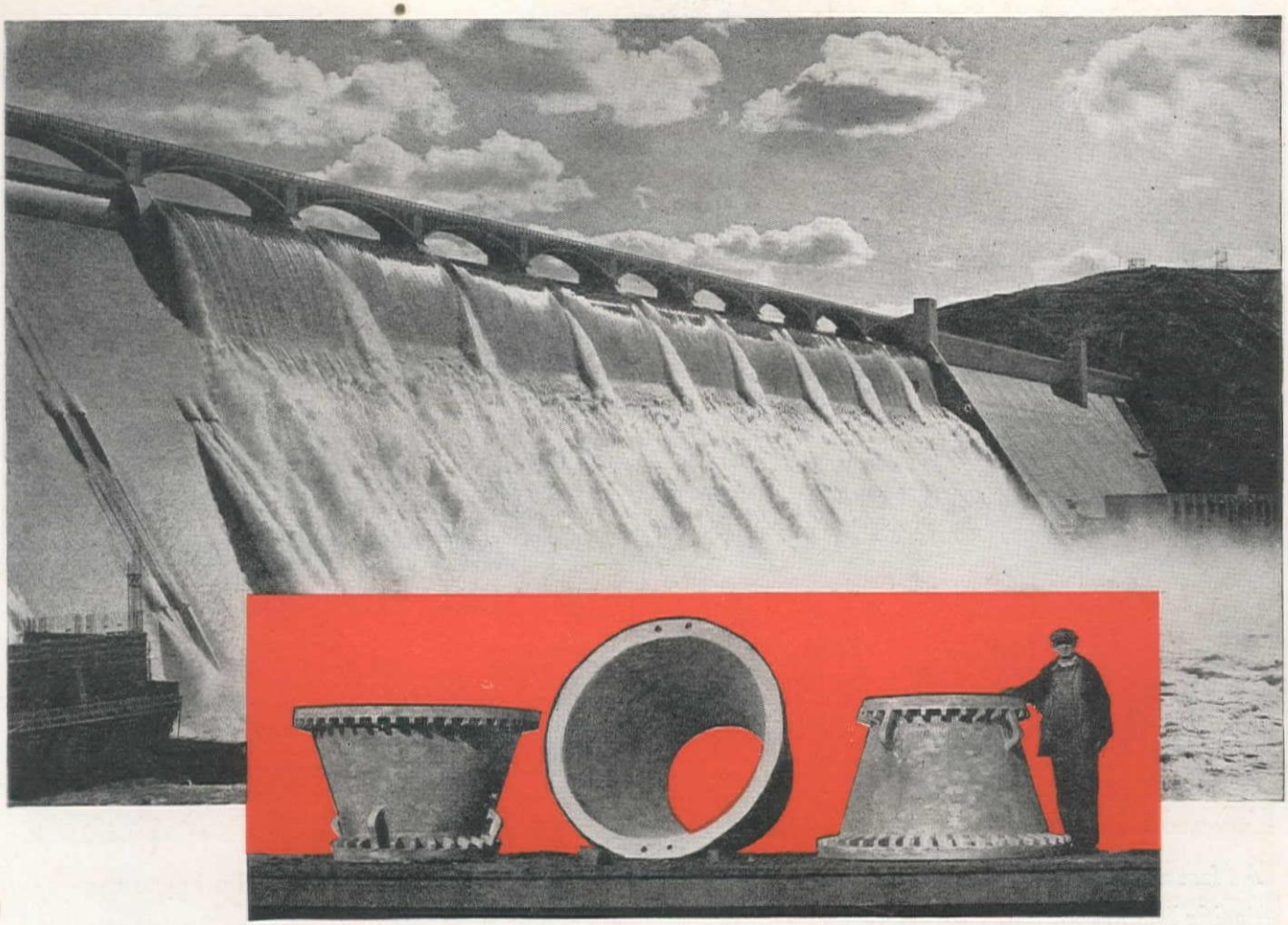
THE fast-drilling, 56-pound CP-42 Sinker features a sturdy, trouble-free, single retainer spring encircling the front end – lengthening service life and lowering maintenance cost. Ideal for general excavation, shaft sinking, road work and quarry drilling. Economical in air consumption. Powerful air blow keeps even the deepest holes free from cuttings. Prove the pace-setting advantages of the CP-42 Sinker Drill under your own operating conditions. Arrange for a demonstration.

There's a CP Sinker for every purpose, from the 28-pound CP-22 to the 119-pound, heavy duty CP-60. All are convertible to wet machines.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL CP COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES



Cut costs with CARCOMETAL

Include high grade alloy steel castings in your post-war plans. Through proper design and careful engineering, alloy steel castings can combine several individual parts into one compact assembly, saving you time, material and costs.

Long before the war, through the development of CARCOMETAL, Pacific Car and Foundry Company had established a nation-wide reputation for quality alloy steel castings. This recognition caused Army Ordnance to turn to CARCO for cast steel armor.

CARCOMETAL will save weight in your castings, decrease bulk, permit lighter sections, and provide strength and high fatigue resistance against the most severe and complex series of stresses to which steel castings can be subjected.

May we join you in a specialized study of your particular requirements?

PACIFIC CAR AND FOUNDRY COMPANY

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

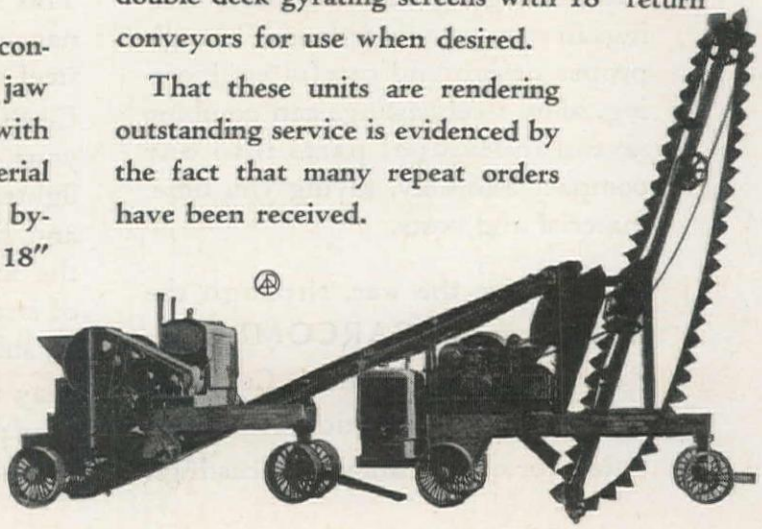
Throwing Rocks at the Japs

As fast as the Japs are pushed back from South Pacific Islands, air bases are established. Knowing there would be need for a single, highly mobile rock crushing plant, Universal engineers — early in the war — designed such a plant. Scores of them are in use from Australia to almost the gates of Tokyo.

Designated our No. 522-Q, these plants consist of a 20" x 36" Series "SL" primary jaw crusher mounted on a steel-wheeled truck with power unit and conveyor. Crushed material from the primary is fed to a grizzly with by-pass placed over the truck-mounted 30" x 18" secondary roll crusher, oversize chuting to the roll crusher and throughs going to a bucket elevator boot. Elevator discharges into bin made of native materials to load trucks for hauling to landing strips under construction.

All the plants are provided with 3' x 8' double deck gyrating screens with 18" return conveyors for use when desired.

That these units are rendering outstanding service is evidenced by the fact that many repeat orders have been received.



UNIVERSAL ENGINEERING CORPORATION

323 8th Street West, Cedar Rapids, Iowa

ARMY E NAVY

UNIVERSAL

ROCK AND GRAVEL CRUSHERS, CRUSHING ROLLS, HAMMER MILLS, COMPLETE CRUSHING AND SCREENING PLANTS, WASHING PLANTS, ASPHALT PLANTS, SPREADEROLLERS.

Announcing Improvements
on the
MISSISSIPPI WAGON

One of the New MISSISSIPPI WAGONS

You Now Get More Speed (up to 25½ M.P.H.),
Synchronized 4-Wheel Tractor-Trailer Brakes, Other Features

IMPROVEMENTS made to increase the general versatility and efficiency of the MISSISSIPPI WAGON, now more than ever make it "the World's Most Modern Hauling Unit."

Gear changes in the M-R-S Special International Diesel tractor now make it possible for MISSISSIPPI WAGONS to travel at speeds up to 25½ miles per hour, saving valuable time and increasing profits on long hauls.

Four-wheel trailer brakes are available and are synchronized with the hydraulic brakes on the tractor, providing unusually smooth, effective braking for fast stops and steep grades.

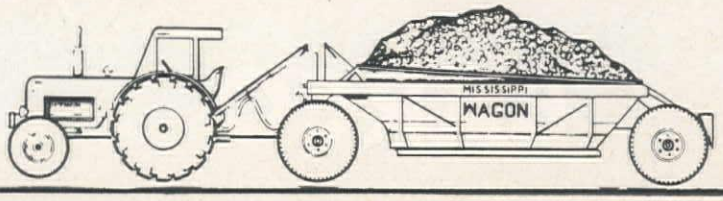
If your problem is hauling over the highways on long hauls, the MISSISSIPPI WAGON will now provide you with still greater economy than heretofore.

If your problem is construction work, the MISSISSIPPI WAGON will give you unusually low hauling costs per yard, placing you in the position of meeting and "beating" that tough postwar competition.

We can make deliveries for essential civilian uses, because our 1945 production is more than twice our 1944 production.

Write us or consult your nearest International Power Distributor for full information on MISSISSIPPI WAGONS—a thorough investigation will warrant your investment in MISSISSIPPI WAGONS—

"THE WORLD'S MOST MODERN HAULING UNIT"



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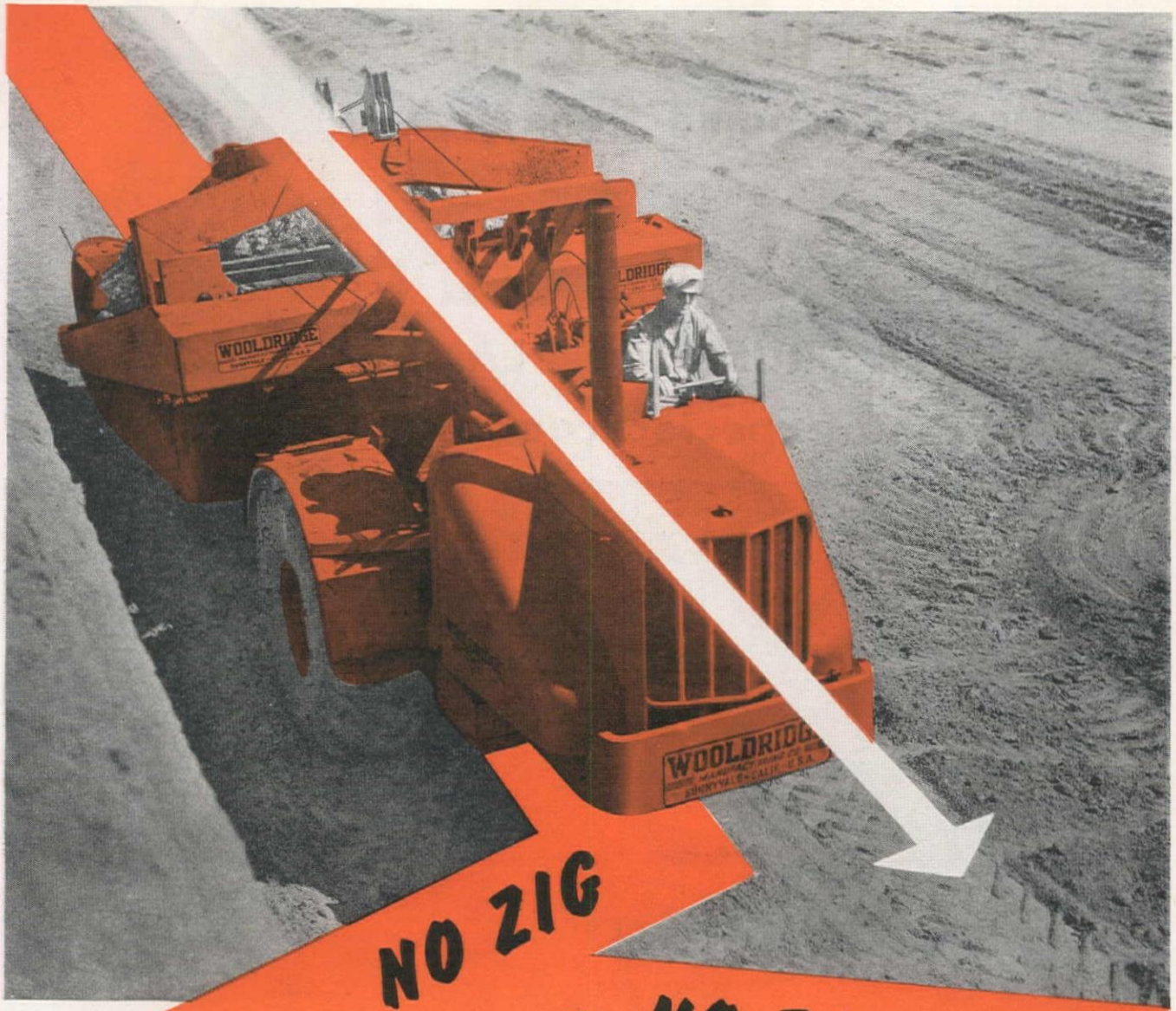
MANUFACTURING CO.
JACKSON, MISSISSIPPI

BARCO MANUFACTURING COMPANY, NOT INC., 1819 Winnemac Ave., Chicago 40, Ill. • In Canada: The Holden Co., Ltd, Montreal, Can.



NO ZIG --NO ZAG

True directional steering of Wooldridge Terra Cobra, high-speed, self-propelled Earthmovers is unique in the field of two-wheeled units. At no time is one wheel required to pull the entire load, even on sharp turns or in soft earth. This results in less strain and wear on equipment and operators, insuring higher hourly averages throughout each daily shift. In a Wooldridge Terra-Cobra positive steering control is combined with positive two wheel power and speed at all times. Investigate fully. Get the full details.

WITH POWER MAINTAINED ON BOTH WHEELS AT ALL TIMES

WRITE TODAY *for twelve-page Bulletin No. TA-425.— And if you are also interested in Heavy-duty scrapers or other earth-moving equipment, ask for Bulletin No. W-210.*

WOOLDRIDGE MANUFACTURING CO.
SUNNYVALE • CALIFORNIA

WOOLDRIDGE

TERRA COBRA

SELF-PROPELLED EARTHMOVERS

Crushing Hard Rock for Oregon Logging Roads..

TELSMITH

PORTABLE CRUSHING PLANTS

far exceed expected capacity!

• To provide faster, more economical timber transportation, Weyerhaeuser Timber Co. is building its own roads and super-truck highways.

To turn out the required aggregate *fast* and *economically* they're using two Telsmith Portable Crushing Plants—one at Longview, Wash.—the other at their Molalla, Oregon operation pictured here.

Each is a Telsmith Two-Unit Portable Crushing-Screening Plant with an 18″ x 32″ Primary Jaw Crusher with feeder, a 28″ Intercone Secondary Crusher, conveyors, vibrating screen, power units, and steel bin.

These logging roads are being built to highway specifications. When producing a minus 4″ plus 1″ aggregate for base course and a minus 1″ for top course, with the Primary Jaw Crusher set at 3″, and 100 per cent of the material being crushed, these Telsmith Portable Plants average 75 cu. yds. per hr. When producing a straight minus 1″ aggregate for top course, they average 40 to 50 cu. yds. per hr. The rock is very hard and tough, but plant capacity has more than met expectations.

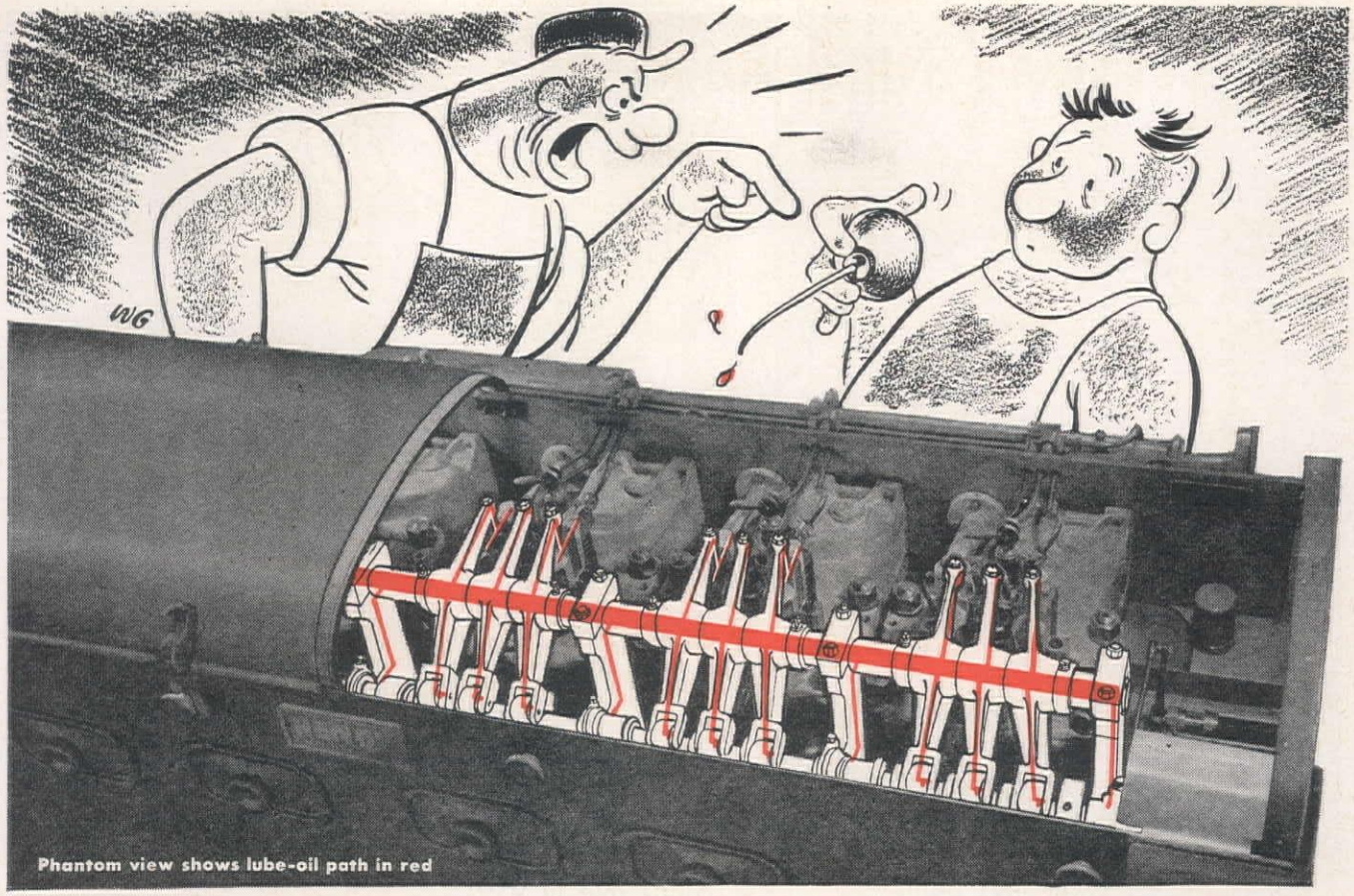
For private logging roads — or any highway anywhere—Telsmith Portable Crushing-Screening Plants will produce the aggregate more economically. *Get Bulletin P-30.*

P-9

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

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

Clyde Equipment Co. Portland 9, Ore. | Clyde Equipment Co. Seattle 4, Wash. | General Machinery Co. Spokane 1, Wash. | Gordon Russell, Ltd. Vancouver, B.C. | Contractors' Eqpt. & Supply Co. Albuquerque, N. M. — El Paso, Tex.



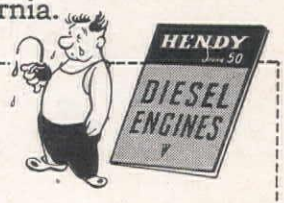
Phantom view shows lube-oil path in red

"Put DOWN that oil can, Lube-oil Reuben!"

No need to hand-oil any part of a Hendy Series 50 Diesel! It's completely enclosed, so *all* parts are oiled from the pressure-lubrication system . . . automatically . . . in correct amounts, neither too much nor too little.

Series 50 Diesels have advantages never before combined in a single design. Besides full pressure lubrication, they have overhead camshafts, unit fuel pumps and injectors, oil-cooled pistons, and many other features.

Now, for the first time, you can have the benefit of *all* these features in *one* tested and reliable Diesel. For complete information, mail the coupon today to Joshua Hendy Iron Works, Sunnyvale, California.



Send for NEW Diesel Booklet
No Obligation

JOSHUA HENDY IRON WORKS
SUNNYVALE, CALIFORNIA

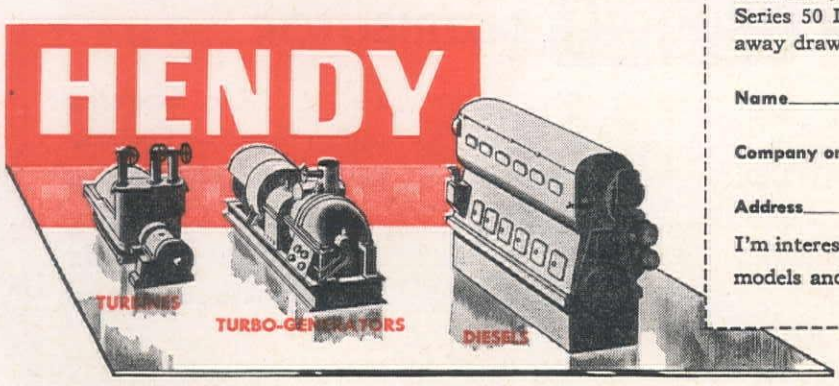
Mail me your new booklet that completely describes the Series 50 Diesel, with photographs and cross-section cutaway drawings showing the design of all major parts.

Name_____ **Position**_____

Company or business_____

Address_____

I'm interested in Marine ☐ Stationary ☐ Diesel-electric ☐
models and in hp ranges from 190-250 ☐ from 250 up ☐



100-D-17

Output Makes 'Em *Fighters!*

A ½-yard 15-B loads trucks on a Southwest Pacific airport job. *(Signal Corps Photo)*

★ ★

Always built to handle tough assignments, Bucyrus-Erie excavators were ready for their role in a two-fisted dirt moving war. That's why they're making such an outstanding performance record on every fighting front and at home. Behind the big output that makes wartime Bucyrus-Eries real fighting excavators are these features that will bring you profits in peacetime:

1. Hook rollers (no center pin).
2. Oil enclosed gears.
3. Independent boom hoist.
4. Independent positive twin-rope crowd.
5. Large diameter boom sheaves.
6. Full mobility with complete steering control.
7. Anti-friction bearings.
8. Field-developed dippers, tiger teeth.

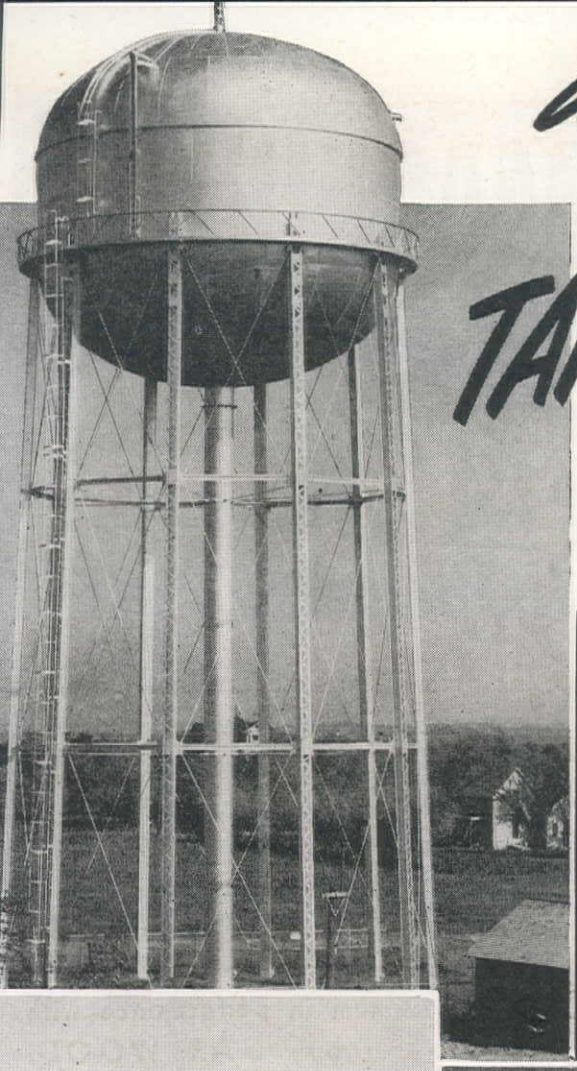
18E45

SEE YOUR BUCYRUS ERIE DISTRIBUTOR

EXC-2

CROOK COMPANY	Los Angeles
CLYDE EQUIPMENT CO.	Portland — Seattle
INTERMOUNTAIN EQUIPMENT CO.	Boise — Spokane — Walla Walla
THE LANG COMPANY	Salt Lake City
THE O. S. STAPLEY CO.	Phoenix
R. L. HARRISON CO.	Albuquerque

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

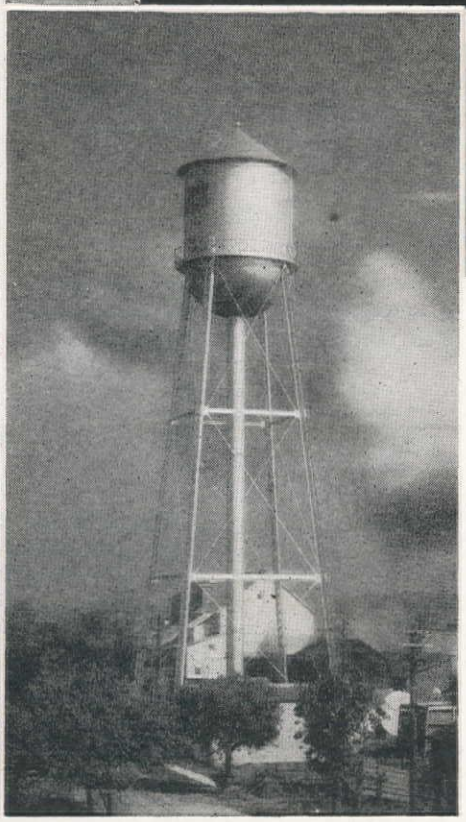


Are you TAKING STEPS NOW

to assure better water service for the postwar years?

Elevated Steel Tanks

by PITTSBURGH-DES MOINES



Now, unhurried judgment can prevail in the analysis of your local water storage requirements. Now, plans can be formulated, studied, reviewed and re-checked—so that when construction becomes possible, your community will gain by immediate readiness to proceed. Use the experience and planning facilities of Pittsburgh-Des Moines at the present favorable time—without obligation.

PITTSBURGH-DES MOINES STEEL CO.

PITTSBURGH, PA., 3414 NEVILLE ISLAND—DES MOINES, IOWA, 915 TUTTLE STREET
NEW YORK, ROOM 921, 216 BROADWAY · CHICAGO, 1218 FIRST NATIONAL BANK BUILDING
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SEATTLE, 522 EIGHTH AVENUE, SOUTH

GAR WOOD ROAD MACHINERY

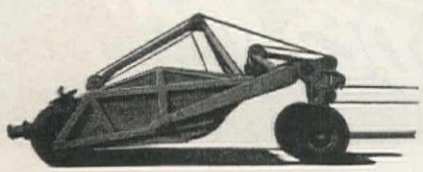
STAYS ON THE JOB

GAR WOOD GW ROAD MACHINERY TRADE MARK

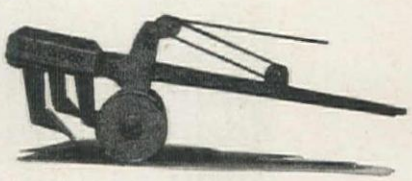
CABLE DOZECASTERS with angling blade for Allis-Chalmers HD-10 and HD-14 Tractors

Gar Wood Industries, Inc., manufactures a complete line of heavy-duty earth-moving machinery • • • 2-wheel Scrapers, 4-wheel Scrapers, Bulldozers, Roadbuilders, Dozecasters, Rippers, Tamping Rollers and Cable Control Units. When anticipating your earth-moving equipment needs, be sure to investigate this modern well-constructed line. Your Allis-Chalmers Industrial Tractor Dealer will be happy to point out the features that make Gar Wood Road Machinery outstanding in the earth-moving equipment field. Get the maximum in performance with a minimum of "down time" • • • buy **GAR WOOD.**

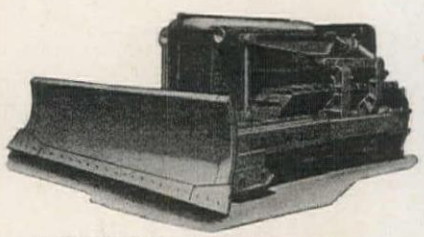
4-WHEEL HYDRAULIC SCRAPERS
Capacities: 8-10-15 cu. yds.



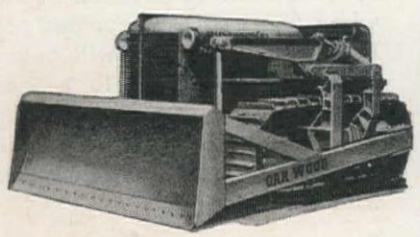
4-WHEEL CABLE SCRAPERS
Capacities: 11-15-20-25 cu. yds.



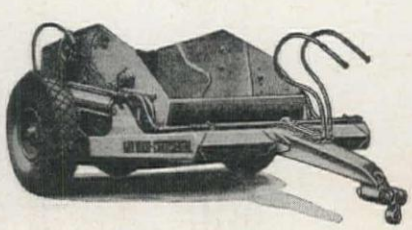
HEAVY DUTY RIPPERS
Cable and hydraulic operation



HYDRAULIC ROADBUILDERS with angling blade. For all Allis-Chalmers Tractors

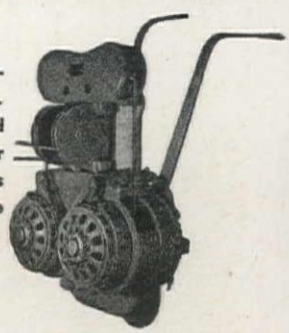


HYDRAULIC BULLDOZERS with fixed blade.
For all Allis-Chalmers Tractors



2-WHEEL HYDRAULIC SCRAPERS
Capacities: 3-5-6-8 cu. yds.

CABLE CONTROL UNITS. Double and single drum for 'most all makes of track-type tractors



GW ROAD MACHINERY is Sold Through **ALLIS-CHALMERS** Dealers Everywhere

ROAD MACHINERY DIVISION
GAR WOOD INDUSTRIES, Inc.
DETROIT 11, MICHIGAN

OTHER PRODUCTS OF GAR WOOD INDUSTRIES INCLUDE HOISTS AND BODIES • WINCHES AND CRANES • TANKS • HEATING EQUIPMENT • MOTOR BOATS

How RPM DELO Oil reduces engine wear

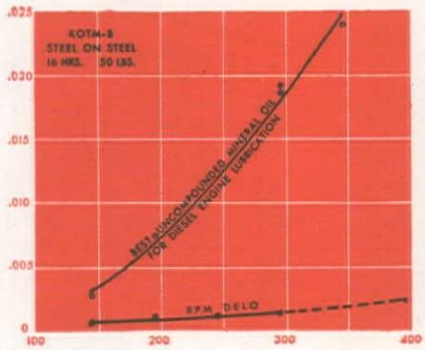
NEW PISTON RING

SCRATCHING WITH UNCOMPOUNDED MINERAL OIL

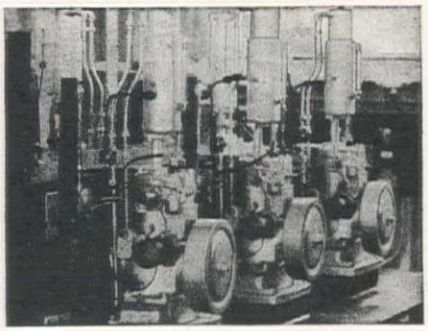
RING USED WITH RPM DELO OIL

The actual photographs above, in which the lines are merely emphasized by printing in red, are typical of the results obtained when testing RPM DELO Diesel Engine Lubricating Oil against ordinary Diesel oils. Because RPM DELO Oil contains a patented metal-adhering compound, it clings to hot cylinder spots that other oils leave dry, protecting rings and liners against excessive wear.

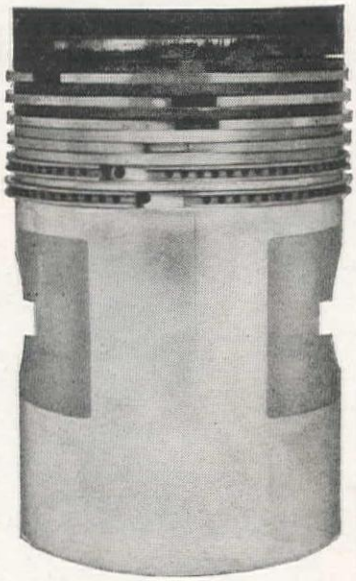
Here is a piston used in a special break-in test with straight mineral oil. This actual photo, with scratches emphasized in red, shows how rings, lands and skirt are badly scratched.



Confirming actual tests in engines are such laboratory tests as this with a Kinetic Oiliness Testing machine. RPM DELO Oil has far lower wear rate than the best uncompounded oil.



Here is a battery of special test engines in California Research Corporation's laboratories. They are used to determine the anti-ring-sticking properties of oils.



This piston went through the same test as the one above—but with RPM DELO Oil. No scratching occurred and every ring is free. RPM DELO Oil's film prevents scratching and scoring.

Detergent compound to clean engine.

Anti-oxidant to prevent gum and sludge.

Wear-reducing compound.

STANDARD OF CALIFORNIA

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help—make your maintenance job easier. Call your Standard Representative or write to Standard.

Write on your letterhead for free technical booklet about RPM DELO Oil and its performance. Address Dept. T-2, Standard of California, 225 Bush Street, San Francisco 20, California.

Getting results...in a BIG way!...

In 1939, when Hitler struck at Poland, trucks took only a few hundred thousands tons of ore from America's iron mines. *In 1944, trucks hauled out* OVER 50 MILLION TONS!

This ore plus scrap metal makes over 35 million tons of steel . . . more than all the steel in all passenger cars now on the road. It is steel enough for almost a million medium tanks . . . or over 110 million 50-cal. machine guns . . . or 15 million big 16-inch Navy shells . . . or more than 800 mighty battleships.

Huge 6-wheel, 30-ton capacity Macks like the one shown below, as sketched by Peter Helck, are doing a lion's share of this big ore-hauling job.

The biggest trucks in standard production today . . . these Macks have *lowered* open pit mining costs, while time and again setting new production records on the job.

Their work is typical of the many, many ways in which Macks, both big and small, are serving the people of America . . . and helping their owners cut costs.

Their stamina is a good example of why Macks for 44 years have been America's No. 1 line of trucks for tough hauling jobs.

★ BUY THAT EXTRA WAR BOND TODAY ★

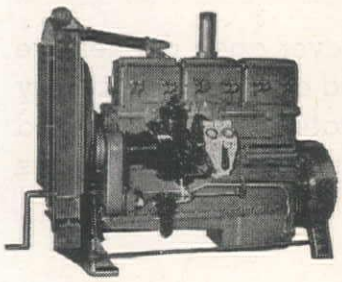
Mack-International Motor Truck Corporation, Los Angeles, Sacramento, San Francisco, Seattle, Portland. Factory branches and dealers in all principal cities for service and parts.

Mack
TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

Performance Counts!

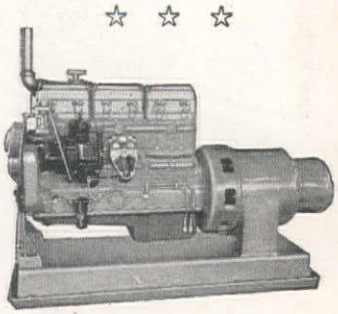
Model H Cummins Diesel is offered in both four and six-cylinder arrangements, developing maximum output of 100 and 150 hp., respectively. This engine is manufactured in a complete line of industrial and automotive models, such as the Model HP-600 power unit, shown above, and Model HBI-600, right, for wheel or track-mounted equipment.

☆ ☆ ☆



The Model HIP-600 is an open type power unit incorporating the same basic engine as that described above. It has a 4⅞" bore and 6" stroke, the six-cylinder unit having a piston displacement of 672 cu. in., and the four-cylinder, 448 cu. in.

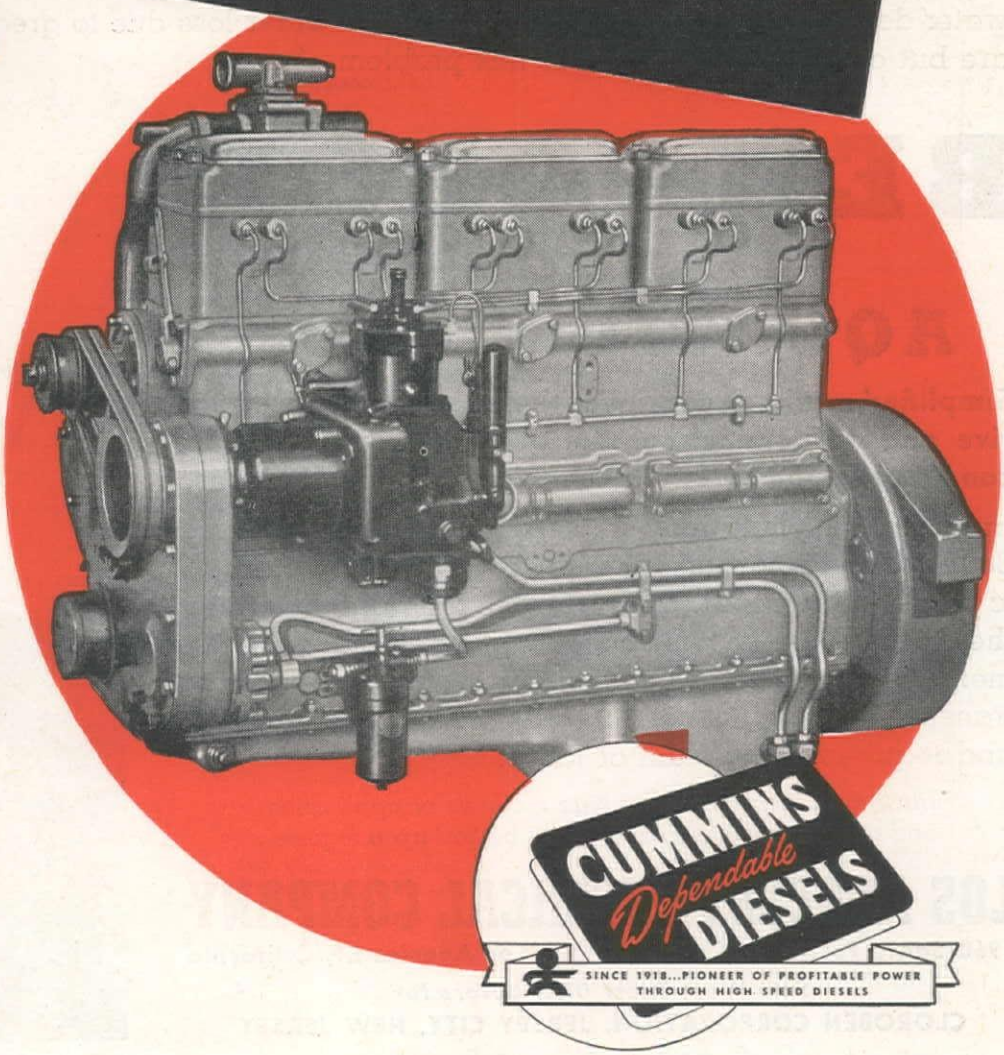
☆ ☆ ☆



The Model HGA-601 is an AC generating set, rated 50 kw. at 1200 rpm. The four-cylinder Model H generating set is rated 30 kw. at 1200 rpm. Both four and six-cylinder sets are also available for DC operations.

"The job you want done is now being done by Cummins Dependable Diesels." That is a statement of fact . . . backed by a 12-year demonstration of reliable, low-cost performance . . . covering all types of heavy-duty equipment and power applications in the construction and aggregates industries — bar none!

CUMMINS ENGINE COMPANY, INC.
Columbus, Indiana



This is a picture of a problem familiar to irrigation engineers wherever open ditches are used to handle water. Dense moss infestations (water weeds); reduced operating efficiency of irrigation systems; undercutting of ditch banks caused by raised water levels; decreased water delivery and flow rate; and increased water loss due to greater wetted perimeters are but a few of the phases of this problem.

BENOCLOR
controls
AQUATIC WEEDS

Simplified methods of application result in more effective and economical control of aquatic weeds than can be obtained by any mechanical or manual means.

In the upper photo may be seen the white blanket of Benoclor as it is carried down stream to contact all aquatic plants in the canal. The picture at the right illustrates the ease with which this application can be made. Equipment for application weighs but a few pounds, is easily transported to points not accessible to large equipment, and requires a minimum of labor.

Illustrated literature describing methods of application and showing results obtained may be had upon request.

LOS ANGELES CHEMICAL COMPANY

1960 Santa Fe Avenue **Los Angeles 21, California**

Sole West Coast Distributors for

CLOROBEN CORPORATION, JERSEY CITY, NEW JERSEY

To OFFSET an OFF-CENTER Load!

• To offset the effects of an off-center load . . . to keep the load pushing straight ahead, without whipping or jerking, Oliver "Cletrac" offers you *controlled differential steering.*

On an Oliver "Cletrac" tractor, the pull of one track is balanced against the pull of the other. The relative speeds of the tracks may be changed to offset the side pull of an off-center load. Power is never completely disconnected from either track at any time . . . *even on turns.*

Bulldozing, trailbuilding or grading, the *controlled differential steering* of Oliver "Cletrac" tractors means added safety. They are always under perfect control . . . on hills or levels. And they steer the same going downhill or up! There's no need to "declutch" or "brake" when turning.

Ruggedly built for long, dependable service, Oliver "Cletrac" tractors are designed to withstand the shocks, strains and twists of construction service. Their unusual accessibility makes maintenance a simple task.

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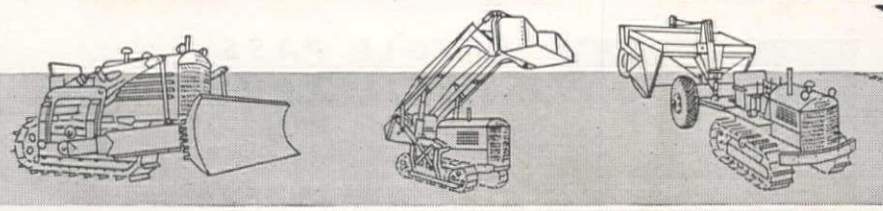
The OLIVER Corporation, Industrial Division: 19300 Euclid Avenue, Cleveland, Ohio.

OLIVER - Cletrac



THE OLIVER CORPORATION

State of California: Gustafson Tractor Co., Eureka, Calif.; Mechanical Farm Equipment Dist., Inc., San Jose, Calif.; Comber & Mindach, Modesto, Calif.; Nelson Equipment Co., Los Angeles, Calif.; Tractor & Equipment Co., San Leandro, Calif. State of Washington: Burrows Motor Co., Yakima, Wash.; Inland Truck & Diesel Co., Spokane, Wash.; Pacific Hoist & Derrick Co., Seattle, Wash. State of Oregon: A. C. Haag & Co., Portland, Ore.; Loggers & Contractors Machinery Co., Portland, Ore. State of Idaho: Idaho Cletrac Sales Co., Lewiston, Idaho; The Sawtooth Company, Boise, Idaho. Western Montana: Western Construction Equipment Company, Billings, Mont. British Columbia: A. R. Williams Machinery Co., Vancouver, B. C.

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Beyond the network of Federal and state highway systems, are literally hundreds of thousands of miles of roads — old, worn-out roads of all descriptions that must be reworked or rebuilt.

Because these roads do not carry enough traffic to justify the cost of paving, as we have known it in the past, they have been neglected. But now, the way is clear — with newly developed methods of soil stabilization. By using native soils to the greatest possible extent, the cost of building highly serviceable roads can be reduced substantially.

Foreseeing the need for modern equipment to go hand in hand with the developments in soil stabilization, P&H engineers have been at work. Through the stages of design, development, and exhaustive tests in all kinds of soils, they have produced a machine capable of using all types of commercial admixtures, and reducing the many operations in soil preparation to a single pass.

The P&H *Single Pass STABILIZER* forecasts a new era in the building of good all-weather roads at lower cost than has ever been known. If you have such projects in mind, it is not too early to investigate.

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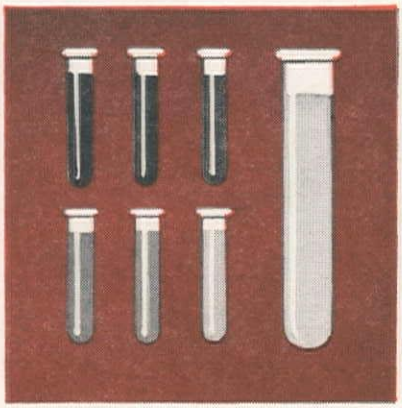
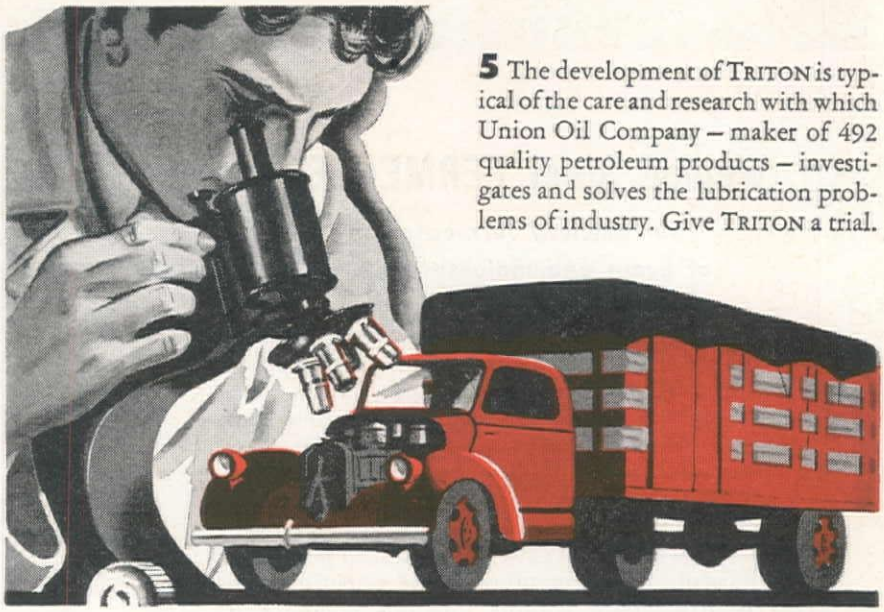
1 Since nearly all carbon formed in engines comes from the motor oil used, you can avoid excessive carbon deposits in your automotive equipment by using TRITON MOTOR OIL.



2 For a laboratory test, made on the 7 leading premium motor oils sold in the West, showed that TRITON MOTOR OIL contained *38% less* carbon-forming elements than any of the other oils and *86% less* than the average.

3 TRITON is a *100% pure paraffin-base* lubricant carefully refined by Union's exclusive, patented, *propane-solvent process* . . . it combines the finest type of a lubricant with a special processing that removes carbon-forming elements.

4 Made especially by Union Oil for the protection of automotive equipment, TRITON is the outstanding laboratory-developed, industry-tested motor oil. It reduces the formation of carbon and gives you better engine performance with fewer overhauls.



5 The development of TRITON is typical of the care and research with which Union Oil Company – maker of 492 quality petroleum products – investigates and solves the lubrication problems of industry. Give TRITON a trial.

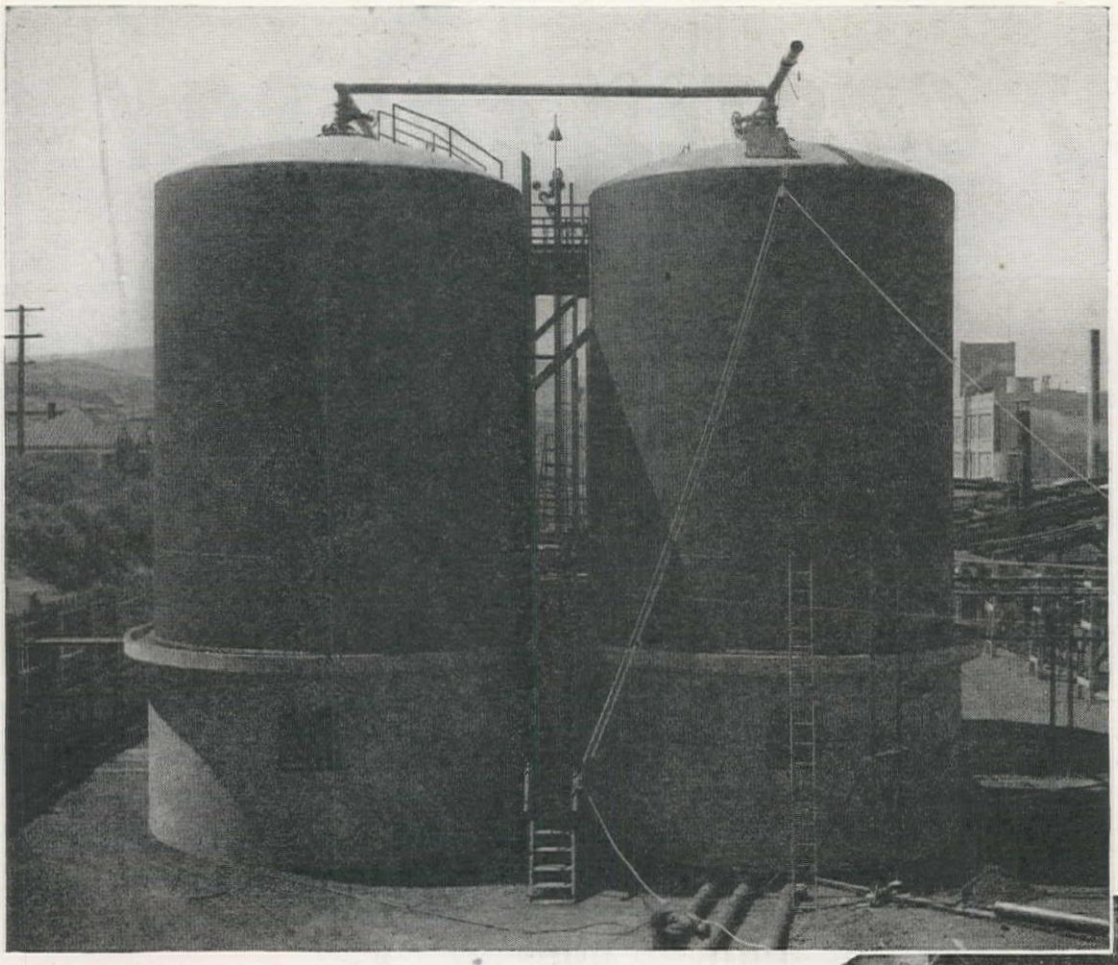
You can get TRITON at any Union Oil Station, or if you would like a supply delivered, phone the Union Oil representative in your area.

TRITON

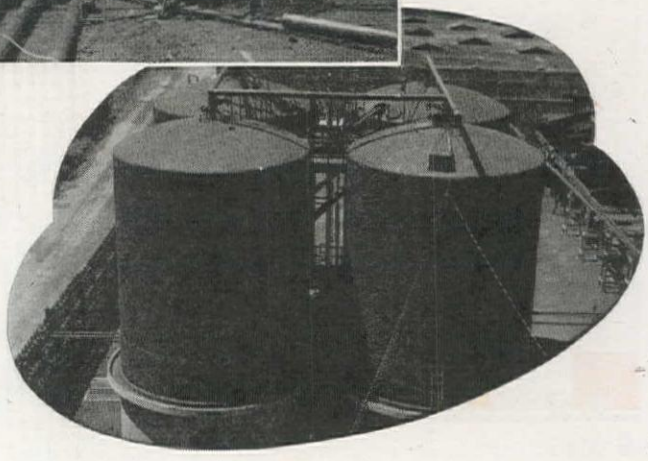
UNION 76

Another UNION OIL *Success-Tested Product*

Affiliate Member, Associated General Contractors of America



The illustration at the left and the close-up below show two views of four 80,000-gal. fermenters designed and fabricated at one of our plants and erected by one of our field crews for the American Distilling Company at Sausalito, California. They are 22 ft. in diam. and have dome roofs and hemispherical bottoms.



Welded Steel FERMENTERS

for efficient fermentation of grain and molasses mashes

The four fermenters shown above are located at the American Distilling Company's Pacific Coast plant. They are 22 ft. in diam., have a 21-ft. shell height and have hemispherical bottoms and dome roofs. They are supported on 5-ft. skirt plates resting on concrete ring-walls 17 ft. high. Each fermenter has a capacity of 80,000 gals., permitting the setting of mashes from 2,500 bushels of grain or 16,000 gals. of blackstrap molasses. By locating the fermenters in the open, outside air is utilized for cooling purposes for several months each year. In the summer a water spraying system helps cool the mash.

You may not be making up designs requiring fermenters at the present time. Most industries, however, require the "services" of storage tanks, bins, steel reservoirs or pressure vessels at some stage of manufacturing operation. When selecting the source for such equipment, we invite you to write our nearest office for complete information and quotations. There is no obligation.

In addition to fermenters, refinery towers and other production equipment, we design, fabricate and erect Hortonspheres, Hortonspheroids, Hemispheroids and all types of pressure vessels for storing liquids and gases under pressure, carbon black bins, blast furnaces, elevated water storage tanks, etc. . . . to help industry.

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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

May, 1945 Vol. 20, No. 5

Support for the President

THE COUNTRY HAS a new President. He is a man of considerably less stature than his predecessor, and it is doubtful if he would have been elected to the office had he been proposed as a presidential candidate. However, the nation can be congratulated that through the manipulations of Sidney Hillman and the Democratic National Committee, Henry Wallace did not ascend to the high position.

Early appraisals indicate that Mr. Truman is an earnest, honest, ordinary man, thrust suddenly into a job for which he has had virtually no training, even as Vice-President, and that he will strive hard and sincerely to fulfill the huge responsibilities he faces. It is anticipated that he will seek AND ACCEPT the counsel of qualified experts in the various fields of government and will not attempt to make the operation of the nation a personal matter. He is wisely staying away from the San Francisco Conference.

As stated in Arnold Kruckman's Washington letter for this month, he obviously will proceed slowly, meanwhile endeavoring to become familiar with his job. He will of course be assailed on every hand by lobbyists, crackpots, and special interests of all kinds, seeking to get him to make hasty commitments before he can be apprised of all the facts of any given case. It is expected that his native conservatism will enable him to stand his ground before these pressures.

He is of course handicapped with extremely weak advisers in some of the Cabinet and high Bureau positions, and while he has indicated that he will make no quick changes, he has left the door open for later changes in positions as he becomes familiar with requirements and capabilities.

This magazine expresses the almost unanimous feeling of best wishes for this ordinary man in the greatest position of our land, and will support him in every action he takes to return our nation to a policy of real Americanism, and economy and efficiency in government. With these considerations in mind, it is respectfully suggested that the horde of men and women with anti-American and anti-democratic tendencies now in high government positions should be soon dropped. The Wallaces, Ickes, Biddles, Hopkins, Tugwells, Cohens, Perkins, Rosenmans, Williamses, and other similar names, would be of far greater value to the country as private citizens working for a living, than as occupants of positions of influence. Toe dancers, movie actors and inexperienced law school graduates have no place as administrative heads of a great nation.

He should, and we believe will, abandon the practice of government by grudge; of personal diplomacy, so that in the event of his death no other individual in the country knows his commitments to grasping foreign governments; of usurping the prerogatives of the legislative and judicial departments of the government. He should, and we believe he will, re-establish the practice of initiating domestic policies in conformity with the Constitution, instead of urging its disregard; of considering first his own country and countrymen in negotiation of foreign policies; of clarifying government rules and regulations so as to encourage and aid business, rather than mystify and hamper it; and of a sound economic basis of existence under the free enterprise system, instead of a "tax, tax, spend, spend, elect, elect" WPA nation.

Party labels mean little nowadays, and whether registered as Republicans, Democrats, or Prohibitionists, this magazine asserts it speaks for the vast majority of its readers in the engineering and construction field in pledging four years of full support to such a program, if Mr. Truman chooses to adopt it.

San Francisco to Be Modern?

REHABILITATION of the surface street car lines of the city of San Francisco has been recommended by Leonard V. Newton, a consultant for the city's municipal railways, in a report filed just as this magazine goes to press. The project would cost an estimated $23,369,000, and suggests immediate action, delaying further consideration of possible subways until a later date.

It would take more time for study than we have been able to devote before we would care to say whether the proposed rehabilitations would indeed "give San Francisco a fine, modern, safe and efficient transportation system." However, if this is the answer to the city's hideous mass transportation dilemma, we're for it. Without a doubt, the city by the Golden Gate has the roughest riding, slowest, worst-looking street car system anywhere in the West. Traffic tieups are common and interminable, accidents are frequent, roadbeds are abominable. There are five modern cars on the entire system.

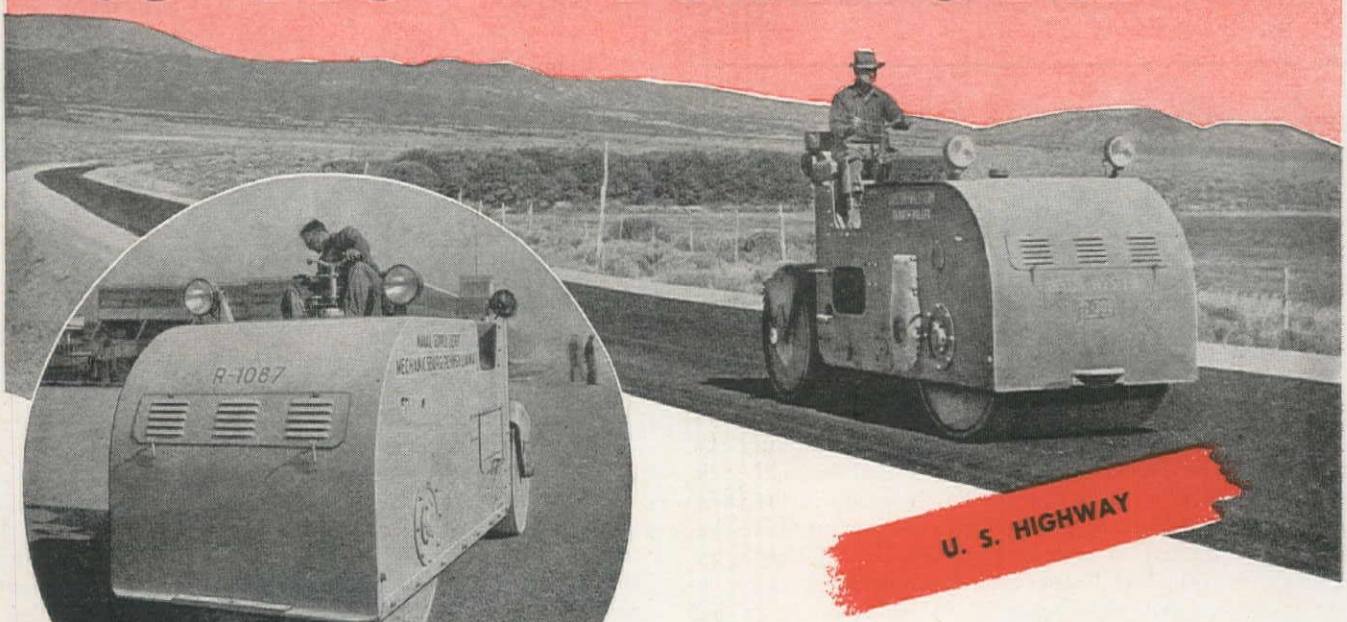
After many times turning the proposal down, the voters last year agreed to purchase the antiquated Market Street Railway and combine it with the Municipal lines. Since that time, service has become steadily worse, instead of better, and in any other city would be considered intolerable. That plans for betterment are being considered is a bright sign, and it is to be hoped they are promptly put into operation.

Plans under consideration by the San Francisco Planning Commission and State Highway Department for freeways and a free-flowing downtown traffic system are also to be commended, and if adopted, will for the first time in many years bring this "Empress Dowager" of Western cities, so well-favored by Nature, and so backward in its development, to a position of equality with other modern communities.

WESTERN CONSTRUCTION NEWS was guilty of a misstatement in an editorial appearing in the April issue, entitled "Down the Drain." It was stated that the contractors on the Canol project had published a book documenting their reluctance to undertake construction of the project. Our source of information regarding this book was mistaken; no such book has been issued by the contractors, nor is one contemplated, they inform us.

The contractors undertook the project at the request and under the direction of appropriate government authorities; they performed the actual construction work with efficiency under the most adverse conditions. We repeat, however, that in our opinion, the project was unsound in its conception, and faulty in its planning by the government.

SURFACE SMOOTHNESS *is its business*



U. S. HIGHWAY

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U. S. AIR FIELD

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WESTERN CONSTRUCTION NEWS
MAY • 1945

Snow Removal—
Fight to Keep Sierra Highway Open

Veteran "Snow-punchers" keep Donner Summit open for critical war traffic to the Pacific ports using the work-horse Push Plow and spectacular "Snow-Go" equipment on this 7,135 ft. pass where a turbulent concentration of weather flows

By CLYDE J. GORMAN
San Francisco, Calif.

THEY DON'T USE ropes and tackle to get your vehicle over Donner Summit, on Highway 40 between California and Nevada, any more—unless you slide off the road. Indians don't bother the place any more. In fact, there is nothing to stop a traveler except an average seasonal snowfall of about 37 ft. and winds that touch a hundred miles an hour.

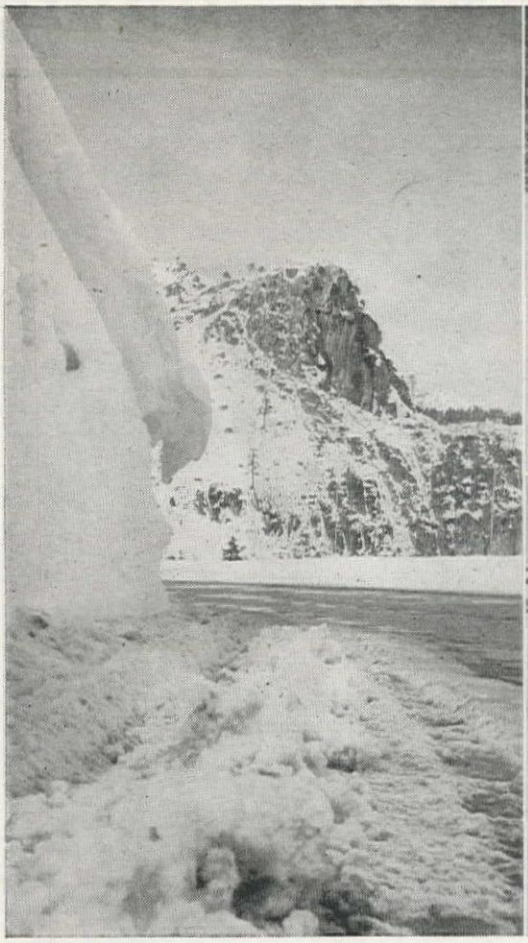
Up on California's top side men live, eat, sleep and fight a new and relentless campaign every winter. They call themselves "snow-punchers." This year there were only 25 of them to do the work of 37. More then to their credit that they have kept the lane open for important war and industrial traffic that moves over this final hurdle to and from the bustling Pacific. This article is both a tribute and a report. It's an account of how they get the job done.

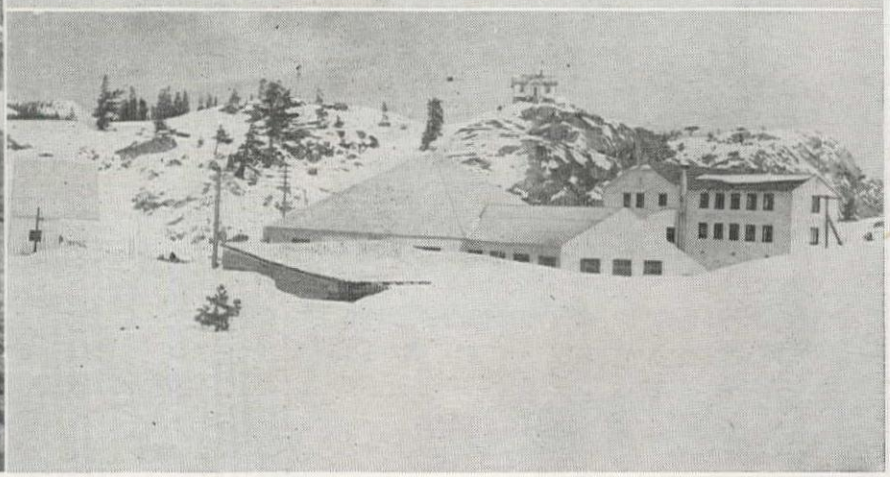
The measure of winter

To understand the nature of the campaign it is well first to take the measure of Old Man Winter at this longitude and latitude. Crest of the climb at road level is 7,135 ft. The Sierras at this point nudge up another 3,000 ft., not sharply but big and sprawling. The effect is to present the first major barrier to heavy moisture-laden winds sweeping in from the Pacific. As mountains go, even the Sierras, this is nothing unusual, particularly in the matter of altitude; but the arrangement of hills is such as to impart extremes seldom equalled. Updrafts and great spirals of baffled atmosphere can drop uncounted tons of snow from October to June and lay down a 17-mi. road block that's as tough as anything in the country. This notch in America's hump serves as a spillway for pent-up weather to pour through and when it does it's devil take the hindmost.

One thing to bear in mind when looking over the table of snow figures shown in this report is the difference between snowfall and snow pack. Fall, of course, is the total amount, while pack is the amount that remains on the ground at any one time. Snow need not melt to disappear. Much of it is lost by evaporation directly into the atmosphere. Then, too, since these measurements are taken in comparatively quiet areas, they do not reflect at all the tremendous local deposits caused by drifting. The snow removal problem becomes infinitely larger when it is realized that these figures represent what the wind has to work with.

The job of keeping the road open reduces down to the job of keeping a snow pack from accumulating on the road surface, either from drifting or direct fall. The degree of success is measured by the amount of pack on the road. The importance attached to this factor is shown by the fact that snow removal equipment begins to move the minute so much as an inch settles on the road surface. Prime rule of the





A POTENTIAL SLIDE, left. Crews minimize these danger points when not fighting storms. Snow-captured automobile, top right, indicates snow depth. Donner Summit Maintenance Station, lower, and in the background, Federal C.A.A. weather station.

snow-puncher is "keep ahead of the pack."

'Ten—shun!

When a storm hits, all attention goes toward keeping the main line, Highway 40, open. Side runs like Hobart Mills to Sierraville or Brockway to Truckee are handled when the reduced manpower permits. Plenty of Snow Bunnies (feminine skiers) manage to get up there; but the resort country, such as the run from Tahoe City to Meek's Bay comes off second best in the face of war competition. The serious job heads the list.

First guess would lead one to assume that these men on top side have plenty of advance dope on what the weatherman has up his sleeve. The worst storms to assail Donner Summit are spawned in the Aleutians, from which point they roll in slowly from the northwest, mostly over water, saving their Sunday punch for a swing on the Sierras. However, the wartime blackout on weather news has left these snow fighters with no more storm warning than a housewife in Sacramento.

Fortunately, the mountain men know what to expect and the counter-attack begins to shape up from the movement of the first snowflake. The foreman on the job is constantly thinking several hours ahead. Local data can be picked up from the Federal Government's CAA weather station on the Summit — such things as wind velocity, temperature, barometric pressures—but mostly he can and does rely on his own judgment. With ample equipment, but short crews, it means figuring out the best disposition of his men to meet any eventuality. It means the perfect coordination and exchange of information between the day and night foremen. On the Summit these two are Oscar E. Beach by day and Claude H. (Homer) Hixon by night. In a tough snow battle neither is very fussy about whose turn it is, any more than you would expect a couple of Army sergeants to worry about taking the present objective before quitting time. Rough going also brings out Superintendent T. T. (Tom) Buell from Truckee, who is no fair-weather boss man. In addition, his job is to examine all the plans of attack as submitted by the several maintenance stations (the Summit stretch is 17 mi. but the whole snow range is 64 mi.) By radio the plans are approved or adjusted to meet the heaviest threat.

The plan of battle

It might be interesting to follow through on a typical snow fight. Say it breaks on the Summit at 1:00 o'clock in the afternoon. Senior Foreman Beach patrols his beat and makes an estimate of the situation. First step is to get out the signs to warn traffic. The initial sign is a mild "Chains Advisable," usually at lower elevations. When things get worse out comes "Stop — Vehicles Without Chains Prohibited." Motorists and truck drivers groan at the sight of this one. Next, Beach alerts or regroups any crews who are out on the road doing routine maintenance. Then, Truckee is informed of the plan, probable extent of the storm, and whether or not more men than the regular crew are needed. Now is the time when heavy equipment operators like Frank Freese (back from a tour with the Navy's Sea Bees) get ready to add a few more rugged hours to their service record. Frank has turned in 12 years on the Sierras for the State, along with Guy White and Wesley Barnhart, two other old-timers whose experience on the big rigs is indispensable. Sidney Gamlin, ace handy-man who has lived on the top so long that he thinks the whole world looks like Donner Summit, is rushing around like a mother hen. Sidney is a one-man ground crew. By this time Ho-

SNOW FALL AND PACK FIGURES DONNER SUMMIT

Season begins in October, ends in mid-June, reaches following proportions (Units are one inch):

MONTH As of Last Day	Average Snow FALL	Average Snow PACK	Highest Snow PACK
October	10	4	13
November	45	10	38
December	115	40	110
January	230	87	157
February	315	101	202*
March	395	90	140
April	430	91	176
May	435	40	100
June	437	10 to 0	50 to 0

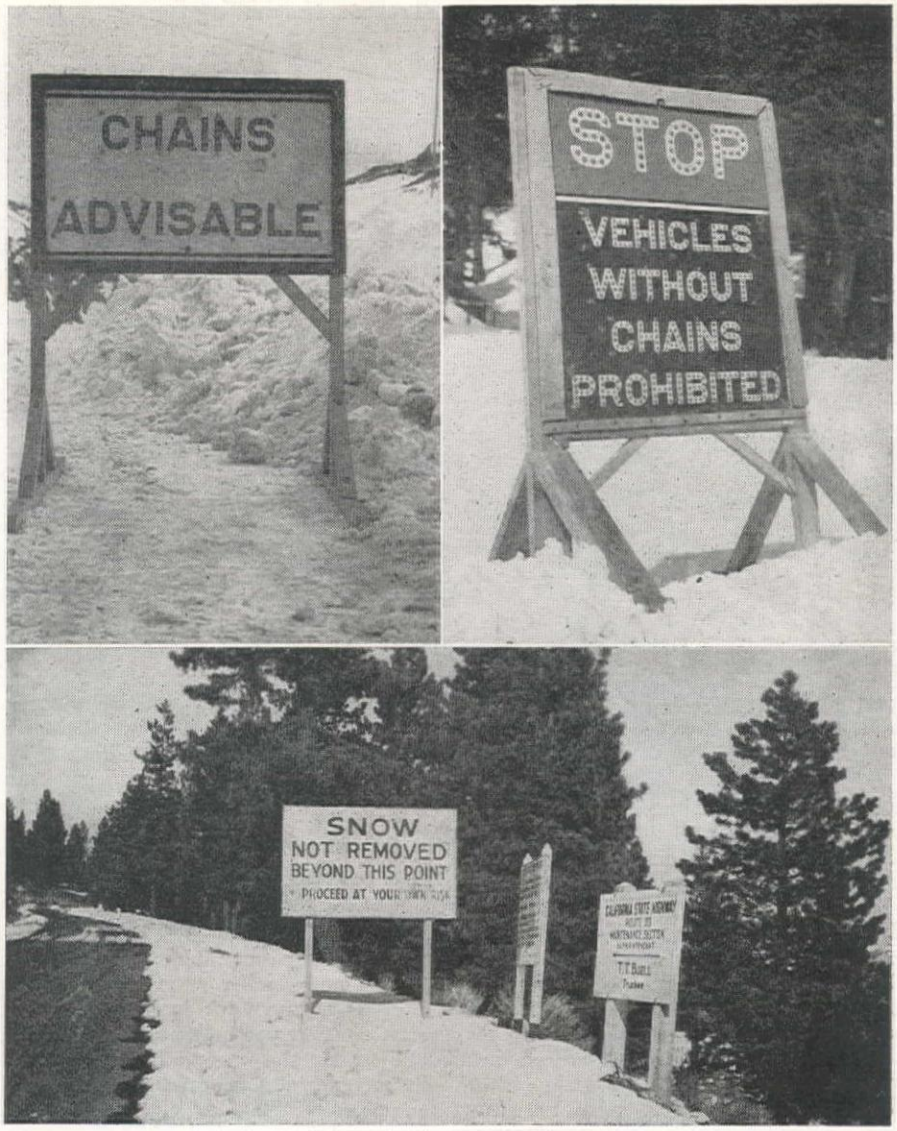
*Feb. 14, 1938.

mer Hixon has smelled the weather from his home on Donner Lake and he is up and ready for a night of it at 4:00 p.m.

First equipment to hit the road is the push plow. Summit station has five of them. These are huge one-way blades mounted on a dump truck, five-ton size. Contrary to popular belief, these are the work horses of snow removal; and not the more spectacular rotaries, although it would be proper to speak of the two types of plows as a team, as will be seen. The push plows are fast workers and their one mission is to keep a lane shoved through the falling and drifting snow. Working from the center out, they cut within an inch of the road surface, shoving their deposit to the shoulders.

In a short time, of course, there is no more room to work. That's where the rotor plows come in. The Summit station has three of these big machines. The trade identifies them as Snow-Go's. They are mounted on an Oshkosh 6-ton dump truck chassis. The place where the dump body would normally go is occupied by a heavy separate power unit that drives the augers and operates the blower. Moving along the shoulders, about as fast as a man can walk, the rotor plows scoop up tons of push plow deposit and blow it to the downhill or lee side of the right-of-way.

As soon as the storm abates, or the path is clear, out come the blades which attack the snow and ice pack that has accumulated on the road surface — an inch or more, depending on the storm's duration. These are ordinary heavy duty motor patrols or graders; standard equipment on any road construction job. The Summit station uses an Adams tandem drive diesel job. In stubborn spots, especially shaded curves and forested stretches, spreaders towed by dump trucks put down a layer of mineral rock screenings, often mixed with salt to melt the pack and provide traction during the process.

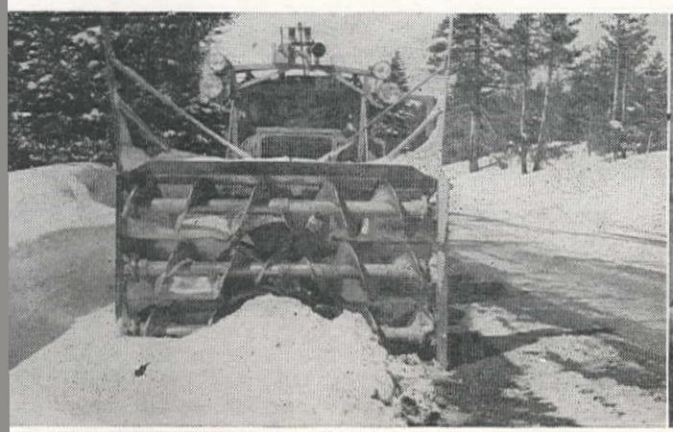


"CHAINS ADVISABLE" is the storm-signal greeting to motorists, followed by the more emphatic warning, when vehicle hazards increase with the continuation of a storm. Lower, only the storm-wise veteran driver should pass this final warning.

When it gets serious

Thus far, our discussion of methods relates to an ordinary smooth-running operation to counter an ordinary storm, which any place else in the country would be a humdinger. When the Donner party gets rough, the boys play for keeps. Then the radios become important. Lives of men themselves depend on the experience of old heads. The location and progress of every snow fighting machine is known. They are shuttled to one another's aid. The push plows finally give up, and the Snow-Go's move in with augers flying, eating a single lane that often as not fills up behind them.

But in the words of Homer Hixon, "it's like throwing sand on a doodle bug," the way the rotors keep their heads out of the snow. They're all right so long as they stay on the road, but once off, they are almost helpless. They may be blinded by the fury of the storm, or shoved off by a slide. That is why one is always held in reserve, or committed to an accessible spot, so it can chew its way to the rescue. There have been times when



HUNGRY MAW of "Snow-Go" rotary snow remover, left. Right, the hard-working Push Plow is first out when storms envelop Sierras. Actually these two machines complement each other to form a perfect working team.

HARRY OATES, veteran "snow-puncher" is foreman of Truckee Maintenance station.

every machine in the place strained on a tow chain to pull a hapless brother back on the road. Men have been killed in this business.

There is one thing that stops everything. High winds may bring a heavy tree crossways of the road. Some of those Ponderosa pine are six feet in diameter. The radio pipes for help, and in comes a crew armed with hand shovels, a power saw, and axes. Severed into moveable chunks, the tree is shoved off the road with push plows, and the show goes on. Trucks carry tired men back to the station for food and rest, carry fresh help to the snow front. Long before this, the State Highway Police Patrol has been called on the job to regulate and enforce travel restrictions, or to aid in rescue work.

Traffic starts moving

In letting traffic on a road that is "heavy but passable" the authorities must assume a certain amount of competence on the part of the traveler. Stranded motorists and truckers act differently, however, depending on their experience and temperament. Some cooperate, others are wild, angry, and scared. They do foolish things, even kill themselves and others trying to force their machines over the hump. Some abandon their vehicles and strike out—like the driver of a large semi-job who slid into a precarious position off the super of a curve—he made his way to Sacramento afoot, mailed in his keys, and was never heard from again.

The State cannot undertake to remove or tow out disabled autos or trucks, beyond getting them out of the way of traffic. The rest is handled by a private garage in Truckee that built a powerful rescue unit, equipped with winches and towing apparatus especially designed to meet the plights of their clients. This truck is kept at the Summit station, and its operation encouraged by the snow fighters who are glad to get help from any quarter. Most of the vehicular road blocking is done by green truck-and-trailer operators, or by people with passenger cars pulling house trailers. Often the latter simply haven't enough power and experience to fight snow and hill both. They try to back up, jackknife, and then the trouble starts.

While highway men concern themselves more with snow removal than they do rescue work, by reason of necessity, they nevertheless avoid passing a stalled car the second time without an investigation. Carbon monoxide sometimes ends a trip as closed autos with leaky gaskets or a tail wind crawl up the grade. Needless to say, the men never pass a set of tracks that go off the road and over the side. At times, falling snow hides these tracks, and only subsequent blowing or thaw reveals the tread marks compressed in earlier snow. The end of the trail is usually pretty grim.

T. T. BUELL, right, maintenance superintendent at Truckee, and radio operator ROBERT PIMLEY talk it over at headquarters station.

Even so, travelers of today—99 years later—can scarcely appreciate the terrific odds that were stacked against the Donners, and the men, their families, the oxen and wagons that stood with them and watched the gap close in that winter of 1846. The men that clear the road today have something of the idea. When you've watched the crushing strength of 5-ton trucks with power in both axles strain against the snow, it is much wonder that an ox that was anything less than Paul Bunyan's blue brute ever got through at all.

Departures from routine

Times and methods change. The use of snow fences, a standard aid in windswept country, has been abandoned on the California portion of this main east-west highway. It was found that wind behavior in the mountains only adds to the wall of snow, when fences are used. With a drift slope of 10 to 1 on the lee side of any obstacle, distances from the highway that would handle the volume of snow become impractical, to say nothing of increasing the danger of slides.

Another departure from routine snow fighting is the road surface itself. The critical section, a distance of 3.22 mi. from a point known as the Fox Farm to the Summit, is reinforced Portland cement concrete. This section is 20 ft. wide, 0.55 ft. thick at the center, increasing to 0.75 ft. at the edges, starting two feet from each edge. It is reinforced by a longitudinal bar imbedded in each edge. Expansion joints are provided between slabs. Shoulders, three feet wide, are oiled compacted gravel. Purpose of this section is to combat the obvious effect of severe climate on less resistant sur-

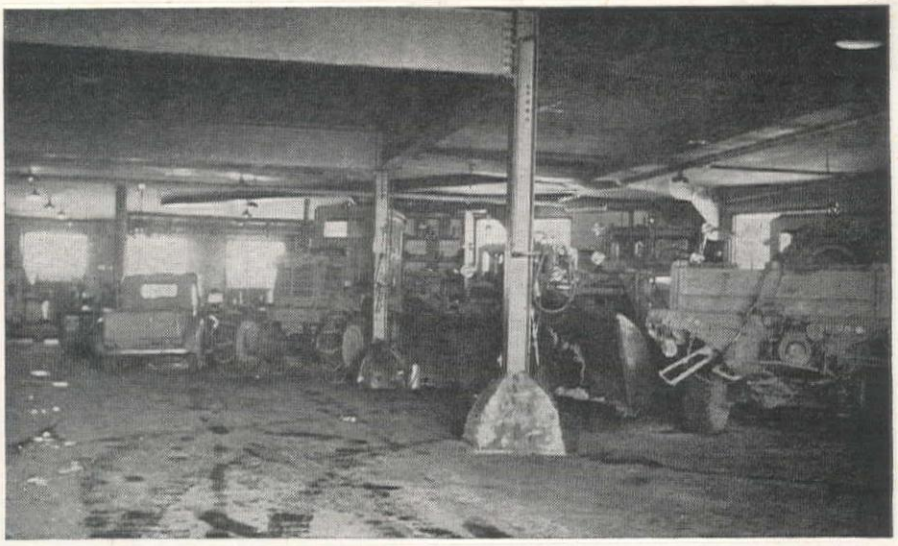
"SNOW-GO" eating away snow banked on shoulders of highway to make more space for push plow operations in the next storm. Snow is normally blown to the lee side of right-of-way. Frontal augers and central rotary blower are powered by separate engine mounted on the truck chassis of the prime mover.

faces, and to by-pass conditions of doubtful subsurface drainage. Then, too, the uniform surface makes possible the close shave by push plow and scraper as previously described. At lower elevations, the ordinary surface heaves with frost boils, but manages to smooth out nicely under summer heat and traffic.

In mapping out their snow removal and maintenance problem for Donner Summit and its approaches, the California Highway Department did not put all its eggs in one basket. Besides the Summit station, which handles the top side stretch from Donner Lake west to Cisco (or a point more accurately designated as "the tin barn"), there are two other stations. On the east, it's the Truckee Maintenance Station, under Foreman Harry Oates. This station is housed jointly with the Division office in Truckee, and takes the main road from Donner Lake to the Nevada line. Oates, by the way, is a big cheerful man who has been snow-punching ever since he can remember. He likes to reminisce about the terrific snow-removing contraptions of the early days. Unlike most old-timers, he admits modern machinery is a great improvement. In fact, he has taken progress in his stride; everything, that is, but one thing. He is constantly seeing snowballs rolling and bouncing down the mountain. These in turn are pursued by coyotes that think they are rabbits. And that worries Oates. What should worry him is the fact that no one else has seen such an apparition.

But to get on with the story: On the Coast side of the Summit is the Yuba Gap Maintenance Station. Equipment from this station picks up the trail at Cisco and heads west to the snow line. This may be around Baxter, or, in a rough storm, clear to Colfax, rarely to Auburn. Foreman here is Harry Schultz, with night man John Lloyd as his assistant. Also stationed here during the winter and working with Tom Buell is Arch Irish, a maintenance superintendent who works the valley in the summertime. Actually, maintenance stretches overlap a little to handle severe spots, and it is not unusual for either of the lower stations to use part of its force to assist the boys on top.

All stations have good equipment shelters and repair facilities. Yuba Gap and Donner Summit Stations are almost identical. Both have boiler houses with oil-fired equipment, 2-story frame bunkhouses that include a mess hall, kitchen, reading room, light plant, and even a drying room where men can hang up wet and frozen clothing after a struggle with the storms. Since the Summit is the most isolated, precautions cover an extensive supply of parts, machine shop stock, acetylene welding outfits. There is little need to discuss what a breakdown means up here, and experience has provided a pretty good index of what to keep on hand. Most used, as you might guess, are cutting tips for the blades. These are cut out and punched from stock flat steel right in the shop as needed. Then there are hundreds of items from spark plugs (everything is gasoline powered except the diesel grader)



INTERIOR VIEW of Donner Summit Maintenance Station equipment shelter and shop where this home-front motorized division is always ready to attack the seasonal storms. Average of 36 ft. of snow falls on this mountain pass road division annually.

to a complete transmission assembly. Little shear bolts are supposed to give when the Snow-Go's augers strike an obstacle; but if the bolts don't give, another set of augers is ready to install, and repairs can be made later.

Administration

Administration of the Division is under the Division of Highway's District Office in Marysville, where C. H. Whitmore is District Engineer, and J. C. Womack handles maintenance. This office is responsible to G. T. McCoy, State Highway Engineer in Sacramento. If smooth operation at the jobsite level is any criterion, it is a well set-up organization.

A lot is revealed by the one stipulation made by T. H. Dennis, McCoy's maintenance engineer, when he granted this writer authority to inspect the Summit. Said Dennis: "I want to see a story about those men who get out and fight the storms. Tell who they are, and how they do their job. They're the ones who deserve the credit—not us."

Well, here you are, Mr. Dennis.

THE BLACK LINE high on the slope is Southern Pacific's snow shed, another answer to transportation difficulties where the annual snow fall is heavy and slides become an impending source of trouble.

Power Company Seeks to Build Project in Oregon

THE CALIFORNIA Oregon Power Company, Yreka, Calif., has filed an application with the Federal Power Commission for a preliminary permit to construct a 40,000-kw. hydroelectric project on the North Umpqua River in Douglas Co., Ore., 50 mi. east of Roseburg. There have been few filings for permits for large power projects since the war began.

The proposed development, to be known as the Toketee Project, would consist of a diversion dam about 500 ft. downstream from the mouth of the Clearwater River; a tunnel in rock about 7,000 ft. long across a bend in the river; a double line of steel penstocks; and a powerhouse with two 20,000-kw. units.

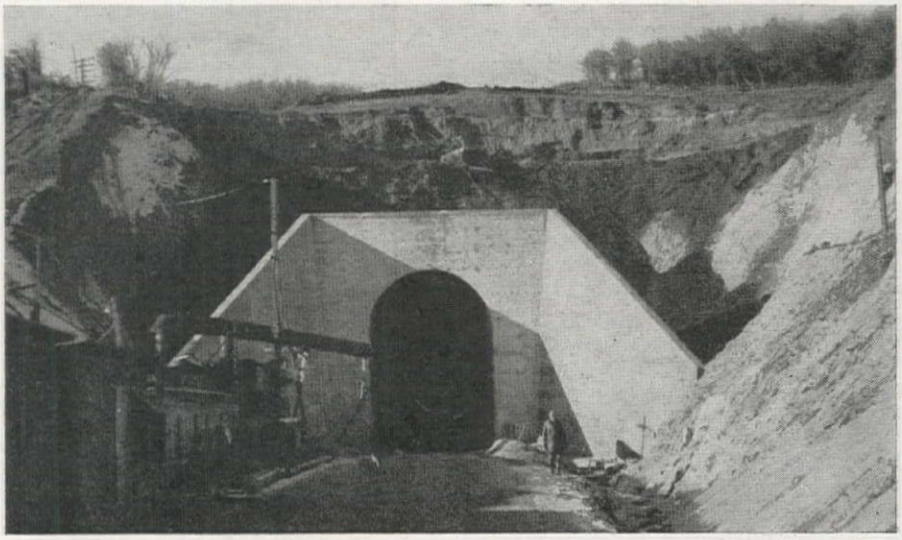
This project is proposed as the first unit of a comprehensive plan for development of the upper North Umpqua River and its tributaries above the mouth of Steamboat Creek.

The company states it plans to deliver the power to public and wholesale customers including Mountain States Power Co. and Pacific Gas and Electric Co.

The preliminary permit, if granted for the desired 18 months, would give the company priority for an application for license, and give it time for continuing studies, preparing plans and arranging finances.

Railroad Tunnel in Montana

Location and design factors required the speedy excavation of deep approach cuts before tunnel operations could be started — Existence of an old tunnel serving heavy rail traffic limited explosive charges which could be used



COMPLETED EAST PORTAL of the Bozeman tunnel of the Northern Pacific, with concreting proceeding inside. The lined dimensions of the tunnel are 18 ft. wide and 24 ft. high above top of rail. Dozer shown filling around the completed portal.

SPEED NECESSITATED by essential wartime traffic in the face of difficult construction conditions has marked the excavation and concrete operations of the new 3,015-ft. Northern Pacific Railway tunnel being constructed near Bozeman, Montana, by the J. C. Boespflug Construction Co. of Seattle, Wash., at an estimated cost of $1,400,000.

The new tunnel, located midway between Bozeman and Livingston, at Bozeman Pass, became necessary as a result of several factors, chief among them being close clearances and failure of the lining of the existing structure. Because of these conditions, together with smoke and heat problems arising from the limited size of the old tunnel, plus the fact that heavy, essential traffic made it practically impossible to do repair work, it was decided to drive the new bore.

The old tunnel was constructed in 1882 and 1883 with a clear height of 19 ft. above top of rail and a width of 16 ft. The new tunnel is 18 ft. wide and 24 ft. above top of rail, and will be 639 ft. shorter than the former structure, which was 3,654 ft. long. It will have a uniform grade of 0.6 per cent ascending to the west, an improvement over the old grades which are heavier for westward movement. At the present time, starting at the east portal, there is 700 ft. of 1.2 per cent grade, 1,900 ft. of 0.8 per cent grade, 200 ft. of 0.2 per cent, all westward ascending, together with 800 ft. of 0.1 to 0.2 per cent descending grade.

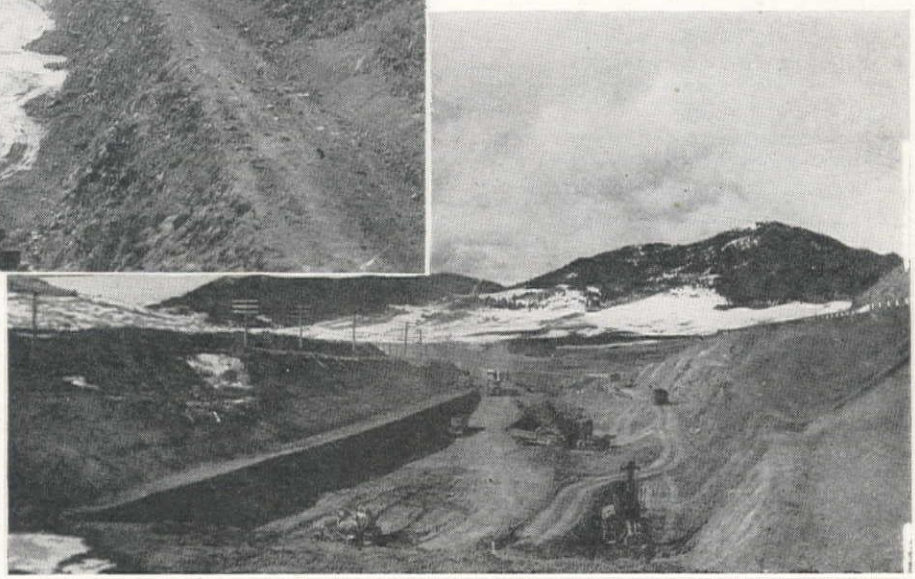
By AL JACOBSON
Seattle, Wash.

Determination of location

Factors considered in determining the design were: the location in relation to the old tunnel; the thickness required for walls and arch, to eliminate the use of reinforcing steel; the type and amount of temporary tunnel lining for protection until concrete lining could be poured; and the economical length. The length of the tunnel was decided upon after study of approach excavation costs, maximum length which would afford good smoke clearance and heat dispersal. The location was of primary importance in order to protect the walls of the old tunnel from the effects of blasting operations in the new tunnel and approaches, for with wartime traffic a cave-in would have been a disaster of major proportions. Consequently, a site 100 ft. north of the old tunnel was chosen. Up to 13 time delays were employed in the tunnel blasting operations and up to seven in the approach work, and these in no case resulted in disturbance of the old passageway.

The walls of the new tunnel were designed for 18-in. thickness where bent rail temporary lining was used and where the rock was safe to stand without temporary lining, and were increased

POWER SHOVEL cutting highway detour prior to starting approach cuts for the tunnel, upper. Wagon drills (right) prepare approach cut for blasting. Explosive charges were limited, due to the proximity of the existing tunnel. Winter conditions also added to the difficulties of the job.



BOZEMAN TUNNEL west portal approach cut showing the excavation nearly complete, left. Power shovels loading five cu. yd. trucks from separate benches of the same cut during early stage of construction, below. Approach excavations consisted of 165,000 cu. yd. of common excavation and 130,000 cu. yd. of solid rock removal.

to 24 in. in thickness where timber lining was employed. The arch was set at 1 ft. 8 in. where bent rail lining or no lining was required and increased to 2 ft. 6½ in. where timber was used for temporary lining. Reinforcing steel was used in the curbs and foundations but not generally in the walls and arch. The portals were reinforced over the arch and 52 ft. of tunnel were reinforced where very soft ground had been encountered in the excavation.

Excavation of approaches

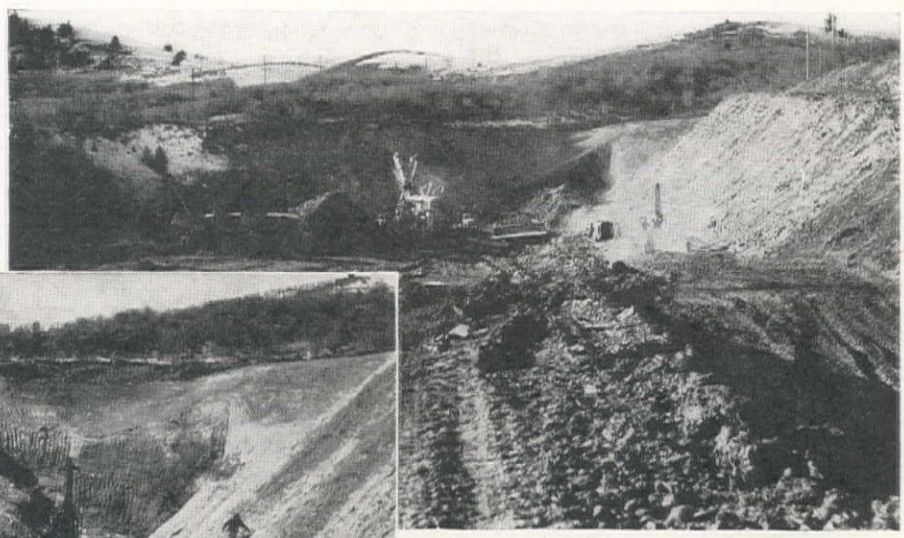
Tunnel excavation amounted to 2,991 lin. ft. without classification; the approach excavation consisted of 165,000 cu. yd. of common excavation and 130,000 cu. yd. of solid rock removal. The tunnel lining called for 17,000 cu. yd. of concrete and the portals used 1,638 cu. yd.

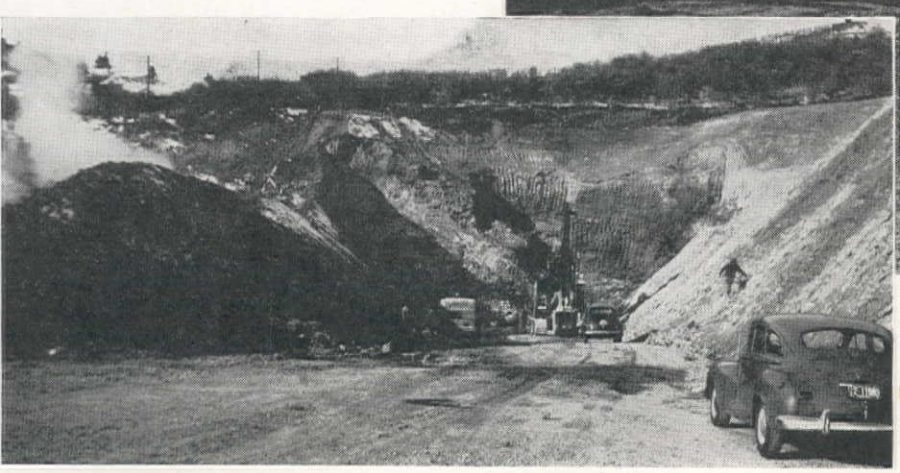
Work was started at the east portal cut in December, 1943 with a gas shovel and a 2¼-cu. yd. bucket, which loaded four 8-cu. yd. trucks. This equipment was soon augmented with four tractors pulling 10 to 12 cu. yd. scrapers. One tractor was used as a pushcat and for pulling a two-toothed rooter for breaking up frost and hardpan. A sixth tractor was used to blade roads and level the pits.

As soon as the east portal cut was well under way a second shovel was shipped to the job for making a detour of U. S. Highway 10 which swung out over the location of the west portal cut and had to be relocated before work could be started on the west approaches. Four trucks of 5-cu. yd. capacity were shipped in to work with the second shovel, which was equipped with a 2½-cu. yd. bucket.

Rock drilling was done with wagon drills using two 400-cfm. gasoline compressors. Columbia special 40 per cent gelatine was used for explosive with up to seven delays. The shots were limited in general to 50 to 80 lb. per delay. At the west portal cut it was necessary to remove solid rock within 27 ft. of the old tunnel and within 10 ft. of the present west portal. At these points, shots were limited to seven pounds per delay. In addition, the Union Construction Co. of Great Falls, Mont., grading sub-contractor, removed as much rock as practical with the rooter and scrapers at these dangerously close places. The rock was a rotten shale and generally broke up very well, but where sandstone was found, it had to be blasted loose.

In general, the scrapers were employed to remove the common excavation with the shovels following behind loading the solid rock. In some instances the scrapers were used on blasted rock but not





EAST PORTAL CUT, on the Livingston side of Bozeman Pass, in which the grading is complete, left. Early stage of the same excavation showing the equipment in action, above. The bulldozer was especially useful to blade pit free of frozen ruts, thus facilitating efficient truck movement.

as a general practice. As the haul was long for scraper operation, a pushcat was employed to speed up loading and good progress and costs were made with the tractor equipment. The east portal cut was completed on schedule with the J. C. Boespflug Construction Co. moving into tunnel operations Feb. 1, 1944.

The major approach excavation problem was speed, so that tunnel operations could be started with as little delay as possible. Due to the fact that waste areas were limited by the contour of the country, and hauling from the tunnel must come through the approach cut, the approach excavation had to be completed before tunnel work could begin.

The weather was mild during January and February and the grading sub-contractor took advantage of it by working two 10-hour shifts on all work except rock drilling. One shift on drilling kept the two shovels busy and the major part of the approach excavation was completed in three months, after which the work was limited to one shift with some equipment being moved off the job. The west portal approach excavation was advanced far enough by April, 1944 that tunnel excavation could be started at that heading.

Concrete operations

Sand and gravel were shipped in by rail from Helena, Mont., as soon as the weather permitted. Unloading was done with a ⅜-cu. yd. crane using a ½-cu. yd. rehandling clam and trucked to stockpiles. Care was taken to prevent segregation of the coarse aggregate and all stockpiling was done in layers. Trucks were backed out on the stockpile and the gravel dumped in windrows. It was then leveled with a dozer, so that a second layer could be hauled onto the pile.

Concrete operations were started early in the fall with the construction of the portal structures as well as the tunnel lining in the cut and cover portion of the tunnel. The east portal was poured with a 1-cu. yd. gasoline powered mixer mounted below the proportioning plant. Sand and gravel were hauled from the stockpiles to the proportioning plant, dumped into hoppers, weighted and flowed by gravity into the mixer. Cement was delivered in sacks above the mixer and dumped into it from a platform by the sand and gravel hoppers. Concrete was transported from the central mixing plant to the form with a 6-in. pump-crete machine.

The portal structure was formed in place using 1-in. shiplap for face forms, 4 x 8-in. S4S for studs and double 4 x 6-in. timbers for walers. The tunnel outline was formed with moveable tunnel forms and construction joints were limited in order to have a portal as monolithic as practical. The entire portal, together with 10 ft. of tunnel, was poured in six hours, amounting to 1,526 cu. yd. The west portal structure was poured using a paving mixer which was mounted above. The concrete was transported by chutes into the forms. Aggregates were trucked from the proportioning plant at the east end to this mixer and water was pumped from a spring to the mixer.

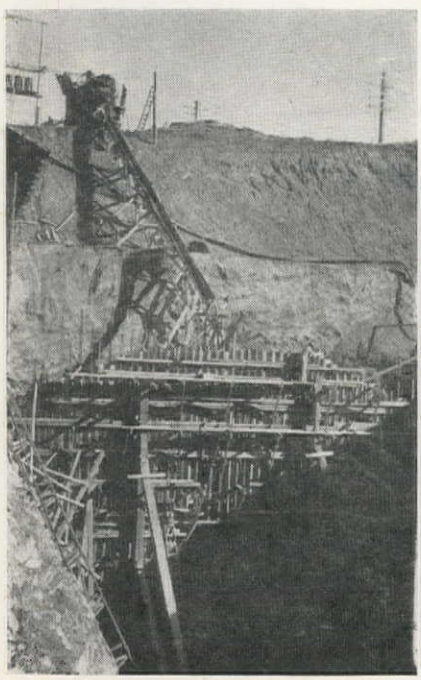
Foundation and curbs

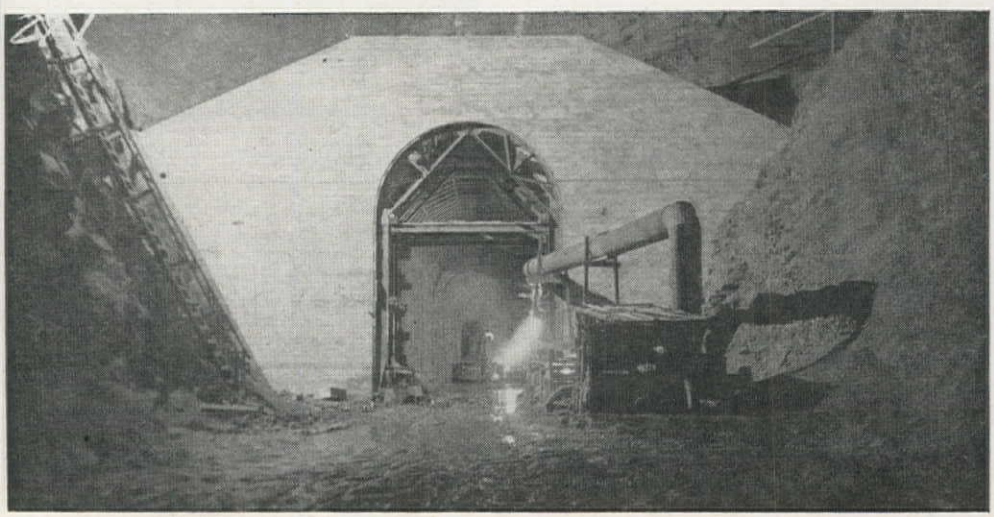
When the tunnel was holed through in Nov., 1944, work was started on the curbs and foundation for the tunnel lining. These were poured employing the mixer at the central plant, the concrete being transported from the mixer to the forms in two 4-cu. yd. transit mix trucks and three hopper trucks with 1-cu. yd. hoppers. As the foundation was to be poured against solid or undisturbed rock surfaces, a crew loaded out the accumulation of muck from tunnel operations. The rock surface was blown down with air jets just before the concrete was deposited. Forms were of wood and made up in 10-ft. sections which were trucked into the tunnel complete and ready to set in place where they were to be bolted to adjoining sections. In general the pours were made in 200-ft. sections. When the concrete had set the forms were stripped and trucked to the carpenter platform outside the tunnel, where they were cleaned, oiled and patched to be used again. Seven hundred feet of curb and foundation forms were built for the 6,030 lin. ft. of structure to be poured.

Two iron workers placed the reinforcing steel in the curbs and foundations directly behind the carpenters as they erected the forms, using approximately 25 lb. per lin. ft. of tunnel. When the curb and foundation pours were practically complete, work was started on the concrete slab which was not reinforced except for a short distance at the portals and through a short section of the tunnel where soft ground was encountered. The slab was designed to be 8 in. thick at the center and 16 in. thick where it joined the curb. However, due to overbreak, the actual amount of concrete poured exceeded these figures.

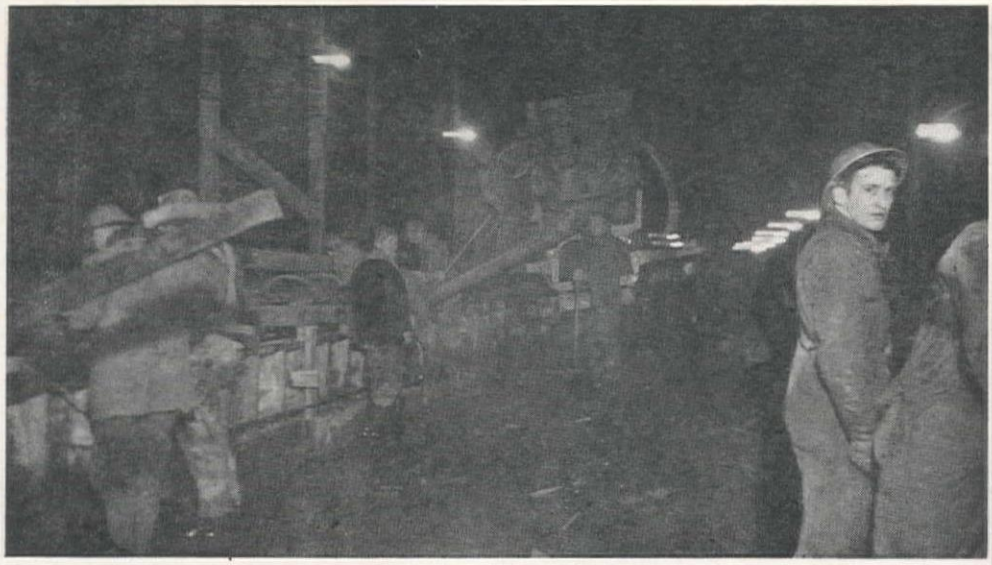
The paver, equipped with an electric motor, was used to pour the slab. The aggregates were trucked into the tunnel from the proportioning plant in diesel trucks, three batches at a load. By this time bulk cement was being used, being shipped to the job in railroad cars and unloaded into a 200-bbl. hopper on top of the proportioning plant with a mechanical cement unloader. It was fed from the storage tank by gravity, to scales, then dumped into the aggregate hoppers and again dumped into the batch trucks. The skip and boom on the paver was used to deposit the concrete in the slab and a home-made screed was pulled by the mixer to strike off the slab, which had a 3⅜-in. crown.

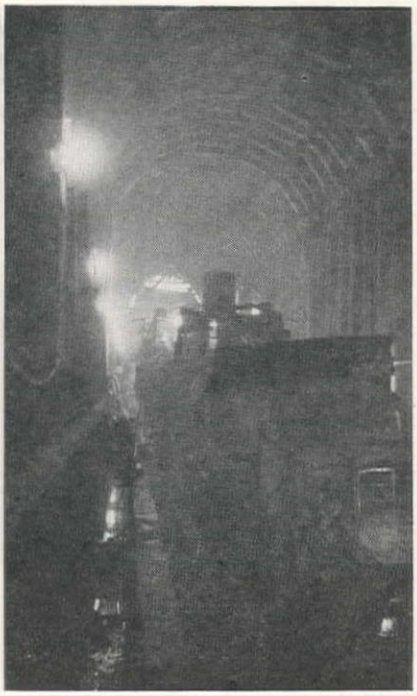
Finishing was done with a full width hand strike off and then floated with a bull float and finally finished with a soft broom. Since the tunnel was damp, no special measures were necessary to cure the slab. Water was heated, and a kerosene torch attached to the mixer was used to heat the aggregates. The air in the tunnel was kept warm with kerosene salamanders, 14 of which were used, moving them around as required.





POURING CONCRETE for the west portal structure, which was formed in place using 1-in. shiplap for face forms, 4 x 8-in. studs and double 4 x 6-in. timbers for walers. Completed west portal, below, showing movable interior form in place. This form, constructed of wood and steel, was arranged to collapse on a ratchet mechanism and travel on a curb rail to next pouring position.





TRANSIT MIX truck discharging concrete into curbing forms, above. Tunnel floor was previously cleaned up with air jets to assure good bonding with concrete lining foundation. Truck dumps concrete batch into paving mixer for floor slab, right.

Tunnel lining

As soon as the slab was completed, the remaining curbs were poured, and the work was started on the pouring of the walls and arch. Two 40-ft. moveable forms constructed of steel and wood were erected and moved with steel flanged wheels rolling on 72 lb. rails laid on the previously constructed curbs. Each was hinged at the top center and collapsed with steamboat ratchets at the bottom. The wheels set four inches off the rails when the form was in place and were lowered and raised with hydraulic jacks. The actual moving was done with a truck or hoist attached to the front of the form. A crew of seven men stripped one of the forms, moved it into place, cleaned and oiled it and made it ready for the next pour in eight to ten hours.

One form was started at the west portal to work east, while the second was set 2,157 ft. in from the east portal. Both of these were to make 21 pours, which brought the west portal form to the starting point of the easterly form. The easterly form was then moved to a point midway between the end of its 21st pour and the east portal, while the form from the west picked up where the east form left off. Each then made 15 additional pours to complete the tunnel lining.

Mixing was again done in the paving mixer with the concrete being dumped directly into an air placer and blown into the form. All concrete was vibrated either internally or externally. As long as the doors in the form could be kept open internal vibrators were used, but after the concrete had reached a point above the spring line, the top of the barrel was partially covered with concrete, thus all doors had to be closed. Air hammers were used against the form to complete the vibration. Actually external vibration was used in addition to internal even when the doors were open.

Air was supplied to the placer through a 6-in. line from a 1,200-cfm. compressor located outside the tunnel. Two receiver tanks were employed just ahead of the placer with a capacity of 200 cu. ft. Air pressure was maintained from 100 lb. per sq. in., when starting and blowing, to 75 or 80 lb. when the charge was completed. It was found that the more air available the better the overbreak above the neat section of the lining would be filled. At the start of a pour, a placing pipe was set four feet from the end of the form. A boot, or baffle, was used at first to prevent segregation but was later found unnecessary. The pipe was left in the above position until the form filled up to the pipe. After the pipe was buried from 12 to 15 ft. in concrete, it was pulled back using the paving mixer for power. Usually the moves were made three feet at a time, and by watching the air pressure, it could be determined whether all concrete that could be blown ahead of the pipe had been placed, and when it was necessary to move the pipe back.

Generally a slump of from three to four inches was used for the concrete, but at times when the overbreak was heavy and there was question as to filling around especially heavy lagged sections, this was raised from 4 to 4½ inches. Thanks to an admixture, good results have been obtained thus far with the above slumps Concrete lining was designed for 4,000 lb. per sq. in. at 30 days, using six sacks of cement per cubic yard and 5¾ gallons of water per sack. One pound of admixture was utilized per sack of cement.

Organization

The work design of the new tunnel was under the direction of H. R. Peterson, principal assistant engineer, and R. R. Brockway, bridge engineer, both members of the engineering staff of the Northern Pacific Railway. D. B. Shoemaker, assistant engineer for the railway, is in charge of the work at the tunnel site, under the supervision of Bernard Blum, chief engineer, and V. A. Bennett, district engineer.

Managing superintendent for the general contractor, J. C. Boespflug Construction Co., is R. I. Riedesel. Tunnel superintendent is Al Aitken and concrete superintendent is Ollie F. Edsall.

Superintendent for the grading subcontractor, the Union Construction Co., is Nelson Robinson.

Sales of Used Railroad Rail Restricted by WPB

CONTROLS OVER SALES of all grades of used steel rail other than those to be used for laying track have been tightened in an amendment to order L-88, the War Production Board has announced.

The amended order provides that sales of used rail of relayer grade may be made:

1. By common carriers directly to industries for the purpose of laying track, without restriction and without certification.

2. To any person, other than dealers, without prior authorization, provided the purchase order is certified to the effect that the rail is to be used for laying track.

3. To dealers without authorization, provided the dealer's purchase order is certified to the effect that the rail is purchased for subsequent resale in accordance with order L-88.

Any amount of used rail of relayer grade in excess of 10 tons to be sold in any calendar month for any other purpose requires prior authorization from WPB.

The new restrictions also bring the Army, Navy and United States Maritime Commission within the scope of the order.

The order as previously written did not provide for sales of used rails to dealers and reconditioners of used rails, who had formerly purchased rails and sold part of them for track work and part for other purposes.

Santa Barbara Studies Water Needs

Isolated from abundant water sheds in other regions, this area must conserve its limited rainfall during wet cycles to carry over into ensuing dry periods or over-draw the critical ground-water supply — Practical solution appears to be increased reservoir capacity for this region

NEARLY ALL the water that can be developed in Santa Barbara County, Calif., for irrigation and domestic use falls as rain within the boundaries of the county. As a result, the county is a natural unit and is almost entirely dependent on its own water resources. Because of its isolation from other parts of the state, the county can expect to develop no great remote water supply projects such as Hetch-Hetchy, Colorado River or Owens valley. Investigations made of importing water from the Colorado river showed that the cost of the water would be in the neighborhood of $75 per ac. ft., which, if there were any available, would be too expensive for further consideration. These facts are from a report issued jointly by Jerome H. Fertig, Bureau of Reclamation engineer, assigned to the Santa Barbara study; Wallace C. Penfield, Public Works Director of Santa Barbara County; and T. A. Twitchell, Supervisor of the county. This article is a condensation of the report.

Since all irrigation and domestic water ultimately comes from rainfall, the peculiar characteristics of rainfall in this section of southern California are of interest. Records show that the rainfall comes in wet cycles of about 14 to 16 years, followed by dry cycles of approximately the same period. During the wet years there is sufficient water for all needs, but during the dry cycle underground supplies may be overdrawn to such an extent that they are not fully replenished during the following wet cycle.

The rainfall is either (1) wasted through floods, (2) stored as ground water for agricultural use, (3) used by natural plant life, or (4) evaporated. With the exception of two existing reservoirs on the Santa Ynez river, the natural underground reservoirs are the main sources of supply for agricultural and domestic use in the county.

Supply is insufficient

During the present wet cycle there has been sufficient water for all requirements, but in the coming dry cycle, water shortage might become critical if a new supply is not developed. Engineers and public officials believe that the flood waters should be conserved and put to beneficial use. With this objective in mind, Gibraltar Dam was built in 1920 and Engineer J. B. Lippincott recommended, in 1931, the building of a series of reservoirs on the Cuyama and Sisquoc rivers to retard the floods and permit the retained water to be released slowly so that it would replenish the underground basin.

Other investigations have indicated that Goleta and Carpinteria were overdrawing their supplies to a dangerous degree and that the solution of the county water problems must be considered from the bases of both conservation and flood control. The optimum solution must be based on facts regarding stream flow, the capacity and yield of natural underground reservoirs, and the present and future water requirements by the various sections of the county.

In order to make full use of the natural water supply, the county contracted with the U. S. Geological Survey, in 1940, to determine by actual measurement the run-off from all important county streams, the water levels and quality, the safe yield of underground reservoirs, and the facts concerning the underlying geology of the areas. In 1941, the county made a contract with the Bureau of Reclamation to make an exhaustive study of the possibilities of developing flood waters for agricultural and domestic use, serving both the needs of water conservation and flood control. These investigations indicate that no section of this county is independent from the others in regard to water resources, agricultural development, or financing.

A study made of the precipitation records at 25 rainfall stations in and adjacent to Santa Barbara county has indicated that the average annual rainfall is about 18 in. at Santa Barbara, 15 in. at Lompoc, and 14 in. at Santa Maria. Santa Barbara is now in the midst of a wet cycle of more than average rainfall and large run-off which sustains the present rate of water consumption. It is probable that this cycle will end in 1948, and in order to have a large reservoir full of water before the expiration of the present wet period, reservoir construction must begin before the end of the present year.

Major watershed areas

Santa Barbara county is separated by mountains into three major basins: the south coastal area in the vicinity of the city of Santa Barbara, the Santa Ynez basin, and the Santa Maria basin. The south coast is a narrow, intensely developed plain extending a few miles in width from the steep Santa Ynez mountains to the ocean. There is little opportunity to develop much water supply in this section since the drainage areas are small, with very steep canyons. The Santa Ynez basin comprises extensive mountain areas with large run-off and it includes a narrow strip of well-developed bottom land, known as Santa Ynez and Lompoc valleys. The Santa Maria basin includes the Cuyama and Sisquoc watersheds which are located in mountainous areas with large run-offs, and the Santa Maria valley which is a wide and extensively farmed bottom land. Both the Santa Maria valley and the Santa Ynez bottom land are underlain by underground reservoirs. The present water supply for irrigation in these two sections has been developed largely by the installation of individual pumping plants drawing water from these underlying water-bearing gravels.

On the south coast the supplies are being overdrawn to the extent of 4,000 ac. ft. per year. The water supply for the Montecito County Water District and the city of Santa Barbara is obtained from wells, and tunnels, and by trans-mountain diversion from the Santa Ynez river basin of flood waters developed by Juncal and Gibraltar dams and storage reservoirs.

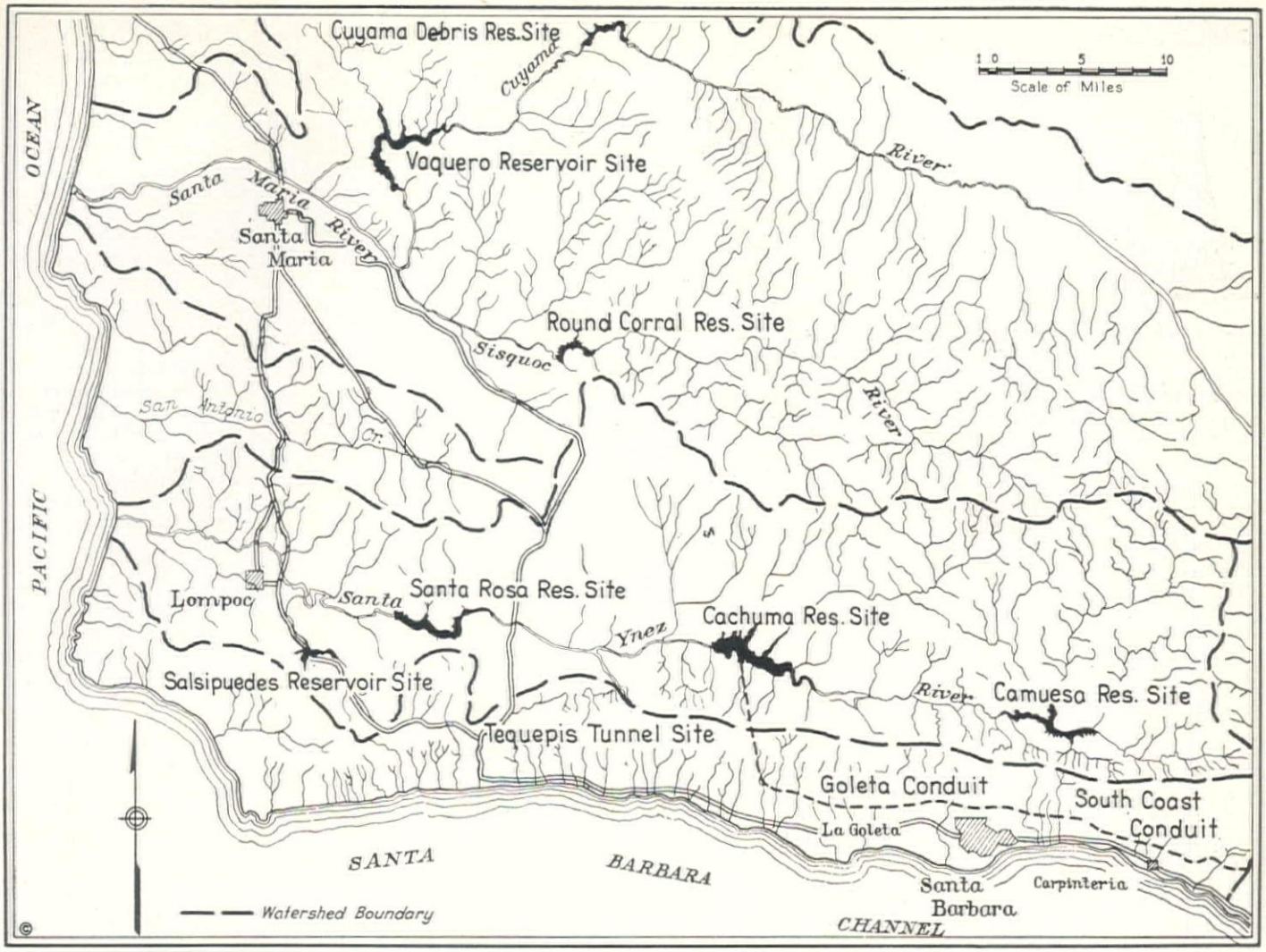
In 1940 the city of Santa Barbara had a population of 35,000, and it is anticipated that during the next 50 years it will increase to 100,000. The 1940 per capita water consumption for the city was about 150 gal. per day. Allowing for the seepage water from Cold Spring and Mission tunnels, the present annual water requirement from storage is 4,500 ac. ft., with the ultimate requirement estimated at 15,200 ac. ft.

Existing sources

The original Gibraltar reservoir had a safe annual water-supply yield of about 5,000 ac. ft., but since the reservoir is now about one-half filled with silt, the present safe yield of around 3,000 ac. ft. is insufficient to meet demands. During the present wet cycle, the situation is not critical, but a repetition of one of the former dry spells would prove disastrous.

The Montecito County Water District constructed Juncal dam on the Santa Ynez river and created Jameson Lake, which has an annual water supply yield of 1,800 ac. ft. These provisions supply adequate water at the present time, but the district's ultimate requirements may necessitate a development of an additional 2,100 ac. ft. per year.

The Carpinteria and Goleta County Water Districts are now withdrawing from groundwater about 4,000 ac. ft. per year more than is normally supplied by nature, and therefore are gradually lowering the water-table. The present annual use of water in these districts is a little less than 10,000 ac. ft. and the ultimate requirement is estimated at more than 24,000 ac. ft.



SANTA BARBARA County water sheds showing the proposed reservoir sites of this area which would supply ample water for the anticipated increase in population. This additional reservoir capacity will assure abundant water supply for the dry cycle expected to begin with the year 1949.

Irrigation supplies

The Santa Ynez and Lompoc valleys are entitled by riparian law to the beneficial use of the usual and ordinary flow of the Santa Ynez river. At present there are 11,000 ac. under irrigation, but when all available irrigable lands including bench lands not more than 300 ft. above the river are placed under irrigation, an ultimate total of 24,000 ac. may be served.

The underground reservoir beneath the Santa Maria valley is ample to meet present requirements but the water table will lower during dry years and pumping costs will be increased with the possibility that present wells might prove too shallow. It is estimated that the water table, which was lowered about 60 ft. by the dry cycle beginning in 1919, will recover about 60 per cent of its loss by 1948.

The most recent development of underground water supply for irrigation is that of the Cuyama valley. This development was undertaken in 1941 and is still in progress. The source of supply is the underground water-bearing gravels, fed by drainage from the north slope of the Sierra Madre mountains and possibly by the underground flow of the Cuyama river.

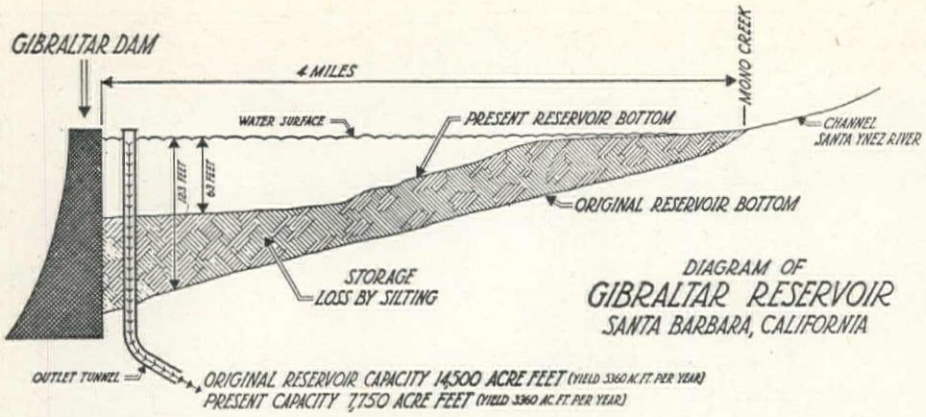
This review of the water situation in Santa Barbara county indicates that the city of Santa Barbara is in urgent need of additional water supplies, and that the riparian rights of river lands prevent the importation of the ordinary flow at the Santa Ynez river. Serious floods in the Santa Ynez and Santa Maria rivers occur from time to time and cause damage to life and property. The solution of both problems is found in the construction of dams which will retard destructive flood waters and store supplies to meet future requirements.

Proposed new storage

A present plan contemplates the initial construction of the Camuesa dam on the Santa Ynez river at a site about 2 mi. upstream from Gibraltar dam, and a pipe conduit from Mission tunnel to serve the city of Santa Barbara, the Montecito, Carpinteria and Goleta County Water Districts. This dam will be of compacted earth-fill or partly rock-fill and the conduit will be built from high pressure steel pipe. Until other dams are built downstream, the Camuesa reservoir will serve to regulate the riparian flow for the benefit of downstream irrigation and to furnish stored water to the Santa Ynez and Lompoc valleys.

It is proposed to construct later a dam at the Cachuma site of the Santa Ynez river about 3 mi. upstream from the San Lucas bridge and to construct the Tequepis tunnel leading from the Cachuma reservoir through the Santa Ynez monutains to Eagle canyon west of Goleta valley. The Camuesa and the Cachuma dams and the Mission and the Tequepis tunnels are considered one unit plan in the development of a water supply from the flood waters of the Santa Ynez river for the use of the city of Santa Barbara and adjacent cities and irrigated lands. The provisions of the plan provide ample water to satisfy present and anticipated future requirements of the area under consideration as well as 10,500 ac. ft. per year to the Santa Ynez river water conservation district, to protect its riparian rights and to provide for dry-cycle needs.

The plan also contemplates the ultimate construction of a dam at the Santa Rosa site on the Santa Ynez river about 9 mi. east of Lompoc. During a wet cycle of years the flood water would be released at a rate which will not exceed the safe capacity of the river channel. During a dry cycle, water will be retained in storage for conservation purposes and released at a rate equal to the amount of percolation in the channel bed, so that the underground reser-



LONGITUDINAL SECTION of Gibraltar Reservoir shows graphically the loss of reservoir capacity due to silt deposition along its four-mile length, which is a contributing factor in the city's current water supply shortage.

voir may be replenished and the groundwater supply maintained at full capacity. This dam is to be built when its need has been demonstrated by additional development of irrigated lands. Ultimately a dam on Salsipuedes Creek may be necessary to take care of complete developments if the greater portion of the Santa Rosa reservoir capacity is required for flood control.

The plan calls for the early construction of the Vaquero dam on the Cuyama river, 8 mi. northeast of Santa Maria and 7 mi. upstream from the river's junction with the Sisquoc river, and the construction later of the proposed Round Corral dam on the Sisquoc river about 18 mi. southeast of Santa Maria and 10 mi. upstream from its junction with the Cuyama river. These dams will serve for both flood and control water conservation with allotted capacities for each purpose. If required, the Cuyama debris dam may be constructed 22 mi. upstream from the Vaquero reservoir to lower the silt flow into the reservoir.

Immediate proposals

It is proposed to construct first the Camuesa reservoir with a capacity of 125,000 ac. ft., which would be about 16 times as large as the Gibraltar reservoir. The cost of this water development, which would be adequate for the next 50 years, should not exceed the present water charges in the city and the surrounding areas, if this undertaking is financed by the Bureau of Reclamation and designed as one unit to supply the entire south coast as planned.

If the city of Santa Barbara enlarged its own Gibraltar reservoir, the cost would be greater than if the city cooperated with the surrounding vicinity and developed a supply for the area as a whole. The continuous enlargement of the Gibraltar dam is not feasible and in order to dredge the silt already accumulated, and that which could accumulate during the dredging operations, it would require the entire water supply for 14 years, and the cost of removal per acre foot would be 16 times the cost of obtaining equal capacity in a new reservoir.

It is estimated that the safe annual yield of Camuesa reservoir until 1962 will be 21,000 ac. ft. and that the maximum water requirement by the city of Santa Barbara would be 43 per cent of that yield. It is anticipated that the irrigation requirements of adjoining and nearby districts will not expand sufficiently to utilize the remaining capacity prior to the end of the dry cycle about 1962. Thereafter, if the 14-year wet cycle should repeat, as in the past, the yield would be in excess of 50,000 ac. ft. per year. If the dry cycle should repeat in about 1976, the annual yield would probably drop to about 20,000 ac. ft. and it would be necessary to construct the Cachuma dam.

Until 1976 the estimated division of the water required by the coast areas is: Santa Barbara, 43; Montecito, 6; Carpinteria, 16; and Goleta, 34 per cent. The ultimate requirements of the several districts is: Santa Barbara, 73; Montecito, 10; and Carpinteria, 17 per cent, with Goleta securing water from the Cachuma reservoir.

It is proposed to construct not later than 1948 the Vaquero reservoir, with a capacity of 197,000 ac. ft., to provide flood control and additional water supply for the Santa Maria valley. It is estimated that about two-thirds of the cost may be chargeable to flood control and, therefore, not repayable to the Federal Government.

Costs and financing

The proposed financing plan for the construction of the Camuesa dam on the Santa Ynez river and Vaquero dam on the Cuyama river is based on the assumption that a county organization would contract with the Bureau of Reclamation to construct the dams. The Bureau has the right, if Congress allocates the necessary funds, to construct the dams under an agreement that construction costs would be repaid over a period of 40 years without interest. This means that the cost of construction would be paid back at the rate of 2.5 per cent per annum. There is one exception to this power if a city participates in the project. In such case the Bureau must charge interest on the principal advanced at a rate not to exceed 3.5 per cent per year. This affects the financing of the city of Santa Barbara's share of the development. However, this interest charge would be offset to some extent by the credit which would be allowed to the city for the use of Gibraltar dam and the Mission tunnel.

The projects could not be financed fully by the districts which will benefit directly by the water development program and it would be necessary for the entire county to contribute something toward the construction costs. The members of the Board of Supervisors believe that the county taxpayers should contribute $150,000 per year to the costs of construction and maintenance of these two dams.

The preliminary estimated cost of Camuesa dam, with its supply conduit and balancing reservoirs, is $9,000,000 and lateral systems to serve Goleta and Carpinteria would cost $800,000. The average annual cost of operation of the dam, reservoirs, and conduits would be $30,000 per year. It is proposed to lease Gibraltar dam and Mission tunnel from the city of Santa Barbara, and the Bureau estimates that the necessary repair of the tunnel would cost $200,000. The total cost of this work would be allocated to the various south coast districts on the basis of estimated ultimate use by each district.

The preliminary estimate for Vaquero dam is $11,000,000 and it is assumed that about two-thirds of this cost would be paid by the Federal Government. In view of the many surveys that have been made, which indicate that the farmers in the Santa Maria valley are overdrawing the water supply underlying the valley, it is felt that the property owners could well afford to pay the remaining amount to assure themselves an adequate and permanent water supply.

The above costs were given in the report presented Dec. 15, 1944, but the estimates are now being revised in the offices of the Bureau at Denver.

New Kootenay River Dam Will Produce 35,000 H.P.

ERECTION OF A new dam and power installation on the Kootenay River was completed recently by the West Kootenay Light and Power Company, Ltd. The company is a subsidiary of the Consolidated Mining and Smelting Co. of Canada, Ltd., and spent approximately $9,000,000 on this power development, which was necessary for the operation of the Canadian Government-owned plants operated by the Consolidated company at Trail, B. C.

The new dam required 210,000 cu. yd. of concrete, and at the peak of construction over 1,000 men were employed on the job. As a result of this erection, a 92-ft. head of water on the Kootenay River is provided. Two generators installed in the new power plant have a rated capacity of 35,000 h.p., which brings the annual capacity of the various plants operated by the West Kootenay company on the Kootenay River up to 329,000 h.p. Provision is made in the new power house for the installation of another generator at a later date.

U. S. Army Airport in Canada

Namao Airport, used as a base for planes headed to Moscow, was constructed in one year and one month and is equipped with the most modern lighting and radio beam facilities — Possibility for expansion is unlimited due to the rural nature of the surrounding territory

TEN MILES NORTHEAST of Edmonton, Alberta, Canada, is what is probably the most modern airport in Canada, and the only airport in the Dominion controlled entirely by U. S. Army Air Force personnel. This airport has now been completed by the U. S. Army, and while flight instructions are still under the jurisdiction of the R. C. A. F., it is for practical purposes a little bit of America in Canada. Details regarding the development of this new airport have been made available through Major Freeman C. Bishop, Chief Public Relations Department, U. S. Army's Northwest Service Command.

The Namao airport is equipped with special flood lights to pierce the thickest fog, and radio beams that can either launch or bring in aircraft completely on instruments.

Major B. M. Dornblatt of New Orleans, Louisiana, was the area engineer in charge of construction for the Northwest Service Command of the U. S. Army.

Namao's runways are about 7,000 ft. long, with provision to extend them to 10,000 ft. and the field covers an area of two square miles—2,560 ac. of ground.

The airport is used to service aircraft being ferried by the Alaskan Division, Air Transport Command, from Great Falls, Mont., to Fairbanks, Alaska, where they are taken over by Russian pilots and pushed over the Siberian route from Nome to Moscow and the fighting fronts. Brig. Gen. Dale V. Gaffney is Commanding General of the Alaskan Division which has ferried more than 5,000 aircraft since its first flights in the fall of 1942.

Construction of this and the enlargement of the other airports on the long line from the Canadian-U. S. border to Fairbanks, Alaska, has been done under supervision of the U. S. Army's Northwest Service Command. Flight strips in between the main air fields also were completed last summer, Brig. Gen. Frederick S. Strong, Jr., Commanding General of the Northwest Service Command announced.

Namao airport is located in a rolling grain belt country, with drainage to local ponds. The soil is an impervious, dark, bentonitic clay compound overlain with a loamy soil of varying depths.

Favorable location

The locale is highly suitable for an airport, as there are no natural or cultural hazards. The low rainfall and short growing season does not allow heavy timber growth and local farm buildings are scattered. Due to low humidity and absence of streams in the vicinity, fogs are few.

Prevailing winds are northwest and northeast, so the two runways were placed on a true NW-SE and NE-SW bearing. The main taxiway is on the west side of the field, connecting the SW and NE ends of the runways, on a true north and south line with the parking apron and hangars located at its center. Taxiways were placed at the dead end of the runways.

Due to the impervious nature of the foundation clay, a base course of 18 in. of free draining gravel was placed under all slabs and extended 10 ft. beyond the paving to a perforated sub-surface drain. A 6-in. corrugated perforated metal drain with two to six feet of clean gravel cover, drains the sub-base gravel by gravity to a common open drainage channel at the runway intersection.

The heaviest fill was four feet, and all fills were laid up in 6-in. layers and all foundation surfaces compacted to 95 per cent of maximum density as determined by the Proctor method. Difficulty was encountered in compacting some of the soil due to concentrations of bentonite which drew moisture either from the air

or sub-soil. This necessitated its removal or blending with other materials.

Gravel handling

Gravel from deposits along the local Saskatchewan River proved unsuitable for use, as it was not free draining and was too friable for concrete aggregate. About 50 per cent of the sub-base gravel was hauled by train and truck from a suitable pit at Onoway, 45 mi. distant. That portion hauled by rail was switched onto trackage laid down the center of the grade and was unloaded from side port cars using a Jordan plow. It was then bladed into place with bulldozers and blade graders. The trucks dumped their gravel in place on the sub-grade.

Due to a change of contract procedure, the remainder of the gravel was secured from another pit located near Camrose, Alberta, and hauled 75 mi. by rail. It was unloaded from car to truck by clam shells and spread on the sub-grade.

The gravel was compacted into two 9-in. layers to 90 per cent of its maximum density. A 1-in. layer of sand was placed on top and rolled into the base to shape it for the paving.

All gravel used as concrete aggregate was secured from the Onoway pit and was scalped at 2 in. with all oversize crushed. A screening plant was erected at the site, and aggregate was washed and separated into two sizes. The plant consisted of a 2-in. vibrating screen, with oversize put through a gyratory crusher and a 20-ft. length of rotary 1-in. punched screen, producing ¼-in. to ¾-in. and 1-in. to 2-in. clean gravel. One thousand gallon a minute pump furnished wash water; the washings were run through a pump box and the ⅛-in. plus material returned to the small size gravel, and the waste water was run into a settling pit for recirculation.

Sand was pit-run from a local pit, and was hauled by truck 14 mi. The aggregates were hauled over the local roads while the frost was in the ground. All aggregates were batched through skid mounted 150-ton weigh batcher bins and hauled to the pavers in dump batch trucks. Bulk cement was used and weigh batched on top of the aggregate. Cement was furnished by the Canadian Cement Co., Winnipeg plant, and hauled in box cars. It was unloaded with two Fuller Kenyon magic wand controlled unloaders.

The paving was placed in 25-ft. lanes, with a grade log and rollers preparing the sub-grade ahead of the dual drum paver, with the following 25-ft. gauge equipment riding on steel side forms: A spreader, a finishing machine, a flexplane for installing longitudinal and transverse dummy joints, and a longitudinal float. Alternate lanes were laid, using two complete concreting units as outlined above. A total of 426,730 sq. yd. of paving was placed in 42 ten-hour working days.

Grading and buildings

Grading was accomplished using scrapers and tractors on hauls up to 1,000 ft. and Tournapulls for hauls greater than that distance. All makes of blades, dozers and auxiliary equipment were used, as the equipment was imported from the United States, and due to the shortage of such equipment in areas where many other priority wartime construction projects were under way during the same period, it was a matter of using any and all equipment available.

The camp and all attendant buildings necessary to operate this airport as an independent station are of Theater of Operation construction, modified for northern conditions.

Test wells were drilled to an 800-ft. depth, but the water was either unpotable or of insufficient quantity. An eight-mile pipe line of 8-in. welded steel pipe was laid to the City of Edmonton for a water supply. All lines require nine-foot burial due to deep frost conditions. An eight-mile power line delivers commercial power to the site. The sewage is treated by the activated sludge process before being pumped two miles to the Sturgeon River. Five miles of railroad spur connects the field to the Northern Alberta Railroad.

Due to the rural nature of the surroundings, the possibility of expanding the runways and facilities is unlimited.

The plans were prepared under the direction of the Northwest Division Engineer, Brig. Gen. L. D. Worsham, and approved by the Canadian Department of Transport. Canadian labor employed by Canadian contractors accomplished the work under contracts as follows:

Coast Construction Co., Vancouver, B. C., preliminary grading and utilities.

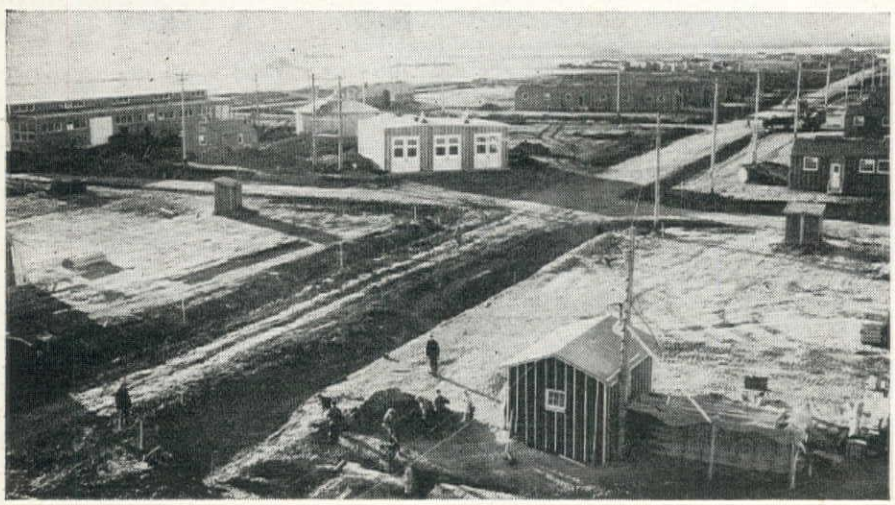
Dufferin Paving Co., Toronto, all paving and grading.

Poole Construction Co., Edmonton, completion of buildings and additional structures and utilities.

Fred Mannix Co., Calgary, Alta., subcontractor on grading.

Construction was started on August 1, 1943, and fully completed on September 1, 1944.

BECAUSE OF northern climatic conditions, modified Theater of Operation construction was used for the camp and attendant buildings at Namao. Commercial power and water are supplied by the city of Edmonton which lies 10 mi. southeast of the airport.



Peace River to Realize New Pacific Coast Road

ANNOUNCED AT THIS year's session of the British Columbia legislature, the proposed highway that will provide the long-sought Peace River outlet to the Pacific Coast, will pass through country of rare scenic beauty and great potential wealth in natural resources.

At a cost of $6,000,000, the government plans to join the ends of existing highways at Commotion Creek, 85 mi. west of Dawson Creek on the Alaska Highway and Summit Lake, 32 mi. north of Prince George.

The 154 mi. of new road required will traverse lush valleys with thousands of acres of good farming land and rich timber areas abounding with big game. It will tap coal deposits estimated to run into millions of tons.

Starting at Summit Lake, the route will follow the Crooked River and numerous lakes linked to Parsnip River where a large bridge will be built. Thence it will swing northeast and follow the Misinchinka River to Pine Pass to cross the Rockies' summit at 2,850 ft. elevation.

It will then swing horseshoe-wise through the Pass, eastward along Pine River to Commotion Creek, there joining the present road system of the Peace River Block and so on to Dawson Creek on the Alaska Highway.

At Prince George, on the Canadian National Railway line to Prince Rupert, the route will connect with the Cariboo Highway stretching 490 mi. southwestward to Vancouver.

At present settlement is sparse along the proposed route. On the part to be built there is only one community—Fort McLeod—with 100 population, mostly trappers. But the road will provide an outlet for some 100,000 residents of the Peace River Block and adjacent country.

It is recalled residents of the Peace Block took up picks and shovels and started to build their own highway in 1937 by way of Monkman Pass.

Lacking money and equipment most of the 40 workers donated two weeks' work; others received $1 daily from a fund donated by businessmen. Storekeepers donated groceries and the Alberta government supplied some tents.

More than 90 mi. of roadway was built in rough fashion, but the project was never completed.

Los Angeles Tackles Sewage Problem

Bond issue makes possible the start of construction of new disposal plant and submarine outfall to correct unhealthful pollution of Santa Monica Bay shore line

WITH THE APPROVAL on April 6 by the voters of the city of Los Angeles of bonds in the amount of $10,000,000 for the first step in the rehabilitation of the city's sewage disposal facilities, City Engineer Lloyd Aldrich and Sanitary Engineer Col. H. G. Smith are prepared immediately to undertake the construction program. It is probable that construction of a new mile long submarine outfall to cost approximately $2,000,000 will begin within the next sixty days. Excavation at the site of the new activated sludge plant will also begin at an early date. It is probable that actual construction of the plant will be somewhat delayed, pending the release of critical materials and arrangements for additional financing.

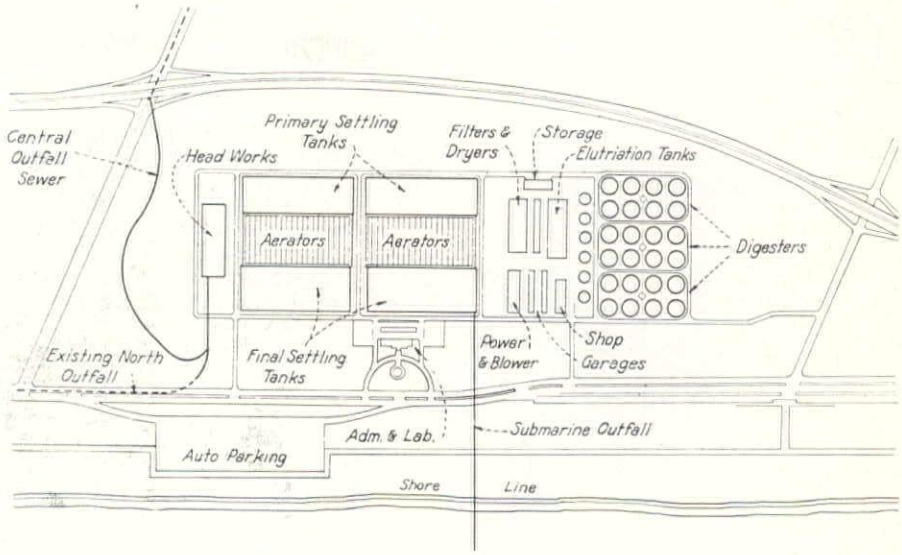
Extensive program

The entire program calls for realignment of the existing central and north outfalls of the city's system to bring them into the head works of the plant; construction of a complete high rate activated sludge plant at Hyperion, to include head works, primary settling basins, aerators, filters and dryers, elutriation tanks, digestor tanks and numerous administrative, warehouse, garage and other structures; a submarine outfall; re-routing of existing highways and landscaping of the entire site. All structures in the plant will be covered except the aeration tanks and will be architecturally beautiful.

The present inflow from the Los Angeles sewer system is 160,000,000 gal. per day, and the new plant is designed to handle 245,000,000 gal. The total cost of the program is estimated at $21,000,000.

The plant is to be located in the sand hills at Hyperion. At its nearest point it will be 1,070 ft. from the beach line to be established under the beach building program outlined in *Western Construction News* for February, and will be 450 ft. from Vista Del Mar, the scenic ocean drive to be constructed under the same program. The property will be bounded northerly by Imperial Highway, southerly by Grand Ave., and easterly by a new shoreline parkway to be known as Pershing Drive. Since the site of the plant is to be excavated from the sand hills, a ridge of sand will be left beside each of these roads so that from no point will the plant be visible. Travelers along Pershing Drive will look directly over the plant to the ocean, but will not be able to see it.

The existing outfall has for several years been in an extremely bad condition, with sewage leaking from nearly every joint. Because of this condition, the California State Health Dept. found it necessary in April, 1943, to quarantine a 10-mi. section of the Santa Monica Bay beach.



SITE OF NEW SEWAGE disposal plant at Hyperion, to be surrounded by a ridge of sand making it invisible from the near-by highways shown in the sketch, which are parkways included in shore line development program proposed for Los Angeles Co.

It has been determined that no chemical deterioration of the concrete has taken place in the existing outfall, according to Col. Smith, and that the leakage is due entirely to the poor joint construction and pipe handling at the time it was laid. The pipe is of bell and spigot design and was laid from barges. As wave action moved the barges, the suspended pipe sections often hit against those already in place, causing cracks, which have since spalled. The joints were filled with an asphaltic compound which has not satisfactorily sealed these cracks and has failed under the breathing action of the pipe in the tides.

Submarine outfall

The new ocean outfall will be laid by a system patterned after that employed in construction of the Posey vehicular tunnel between Oakland and Alameda. The pipe will be cast at a plant on the shore in 100-ft. sections. The ends of these sections will then be sealed and the pipe floated to a point above its final position. By gradually releasing the air it will then be sunk on to concrete platforms and gradually drawn into proper connection with the preceding section. The joints between sections will be sealed with an insert collar of synthetic rubber 3 in. thick and 7 in. wide, which will be cast in the cradle end at the time the pipe is made. The projecting part of this collar will slip into a circular slot left in the spigot end of the adjacent section as they are drawn together. After the joint is firmly closed a blanket of reinforced concrete will be poured over the entire joint, fastening it firmly to the cradle upon which the pipe is resting. This band of concrete will overlap each pipe end at least 2½ ft.

The support for the pipe will be furnished by concrete platforms resting on wooden piling. These platforms will support the cradles mentioned above, which will be cast on the bell end of each section and will support the spigot end of the adjacent section as it is drawn into place. Between cradles the pipe will support itself as a beam, each section weighing 262 T., being 12 ft. in diameter, with walls 14 in. thick.

The outfall will be located approximately 1,000 ft. south of the present outfall and will extend 5,280 ft. from the center line of the Pacific Electric track on the shore. At mean tide, the multiple outlets of the pipe will be about 50 ft. under water. The line will be submerged for its entire length to avoid tidal action. Near the shore line the pipe will be cast in 16-ft. sections and supported on a wooden piling foundation entirely surrounded by sheet steel piling, the entire space within these latter being filled with lean concrete.

Bearing Fails at La Grande Delaying Power Generation

LONG AWAITED power from the $23,000,000 second Nisqually project of the city of Tacoma, Wash., took another setback of several days recently.

After 72 continuous hours of test running the 192-ton rotor of the La Grande powerhouse generating unit failed on April 12. Troubles with the rotor have been recurrent throughout work at La Grande.

The new 13,000-volt generator's difficulty has been traced to the failure of a bearing, according to Utilities Commissioner C. A. Erdahl.

Runoff Forecast—
1945 Water Supply in Western States

SOIL CONSERVATION SERVICE men take measurements of snowpack as basis for 1945 stream runoff forecast. R. A. WORK, of the Service at Medford, Ore., left, and A. E. KENWORTHY, forest ranger at Anthony Lake, Ore. Snow-sampling apparatus includes tube with vision slits, hand scale with holding cradle, and marker pole.

Western watershed runoff forecast as below normal on most streams this year, but reservoir storage to exceed average—Recorded measurements on established courses furnish data on water content of snow, its depth, and other essential runoff factors—Surveys made cooperatively

RUNOFF FROM MOST western watersheds during the 1945 season is expected to be less than a recent 10-year average, but reservoir storage will generally exceed the average. These conclusions are drawn from snow surveys made throughout the 11 Western States in April.

Forecasting the West's water supplies upon which so much of the region's business and agriculture depends starts in early winter when the first heavy snows have blanketed high mountain watersheds.

Each winter some 1,000 men travel approximately 20,000 mi. on snowshoes and skis in the 11 Western States to measure the water content of the snow and give the water users the best obtainable advance information as to the probable reservoir storage and stream flow the ensuing summer. Though two mechanical "snow-planes" are being used in 1945 snow survey work, most of the travel is done on foot under hazardous weather conditions over long distances cross country and in the face of avalanche and other dangers.

Scope of the surveys

The findings of the snow surveys are in demand by many water users, including not only hydro-electric power companies but also irrigation farmers, engineers and construction men planning and building various water-carrying structures, municipalities depending upon mountain water supplies, mining interests, highway and railroad building and maintenance people, and many others. Speedy and accurate water information becomes more important than ever in time of war when every producing resource is being pushed to capacity.

These snow surveyors are drawn from many cooperating local, State and Federal groups and agencies—men who, for the most part, are on jobs making it possible for them to take the trips with least extra travel and expense. They include Soil Conservation Service field men, Forest Service and National Park Service rangers, irrigation district managers, Geological Survey stream gaugers, power line patrolmen, Fish and Wildlife Service hunters, and Bureau of Reclamation and Indian Service employees.

Traveling in pairs, for safety's sake, these men visit about 850 carefully located snow courses from once to several times each winter, depending upon the importance of the locations and their accessibility. Well stocked shelter cabins are maintained where they are most needed. Each course is marked with a number of permanent stations, which are steel poles topped with official snow course signs; and every set of measurements is taken each time at the exact spots where the ones before have been made. As a result, precise comparisons from survey to survey and from year to year are possible. The snow water forecasts based on these measurements thus

become increasingly accurate. All the forecasts, of course, are made on the assumption of normal rainfall during the spring-to-fall water-using season.

Method of sampling

Earliest snow testing was of depth only until about 1900, when the significance of its water content began to be taken into account. Today the so-called federal sampler is used. It consists of enough 30-in. light-weight metal tubes that, screwed together, they may be pushed down through the deepest snow and a complete column, or sample, of snow taken to the ground level underneath. The tubes are graduated in inches, with peep-slits through which the snow inside may be seen and its depth noted.

Next, the snow-filled tube assembly is weighed on a special hand scale that is so calibrated to give a reading of the inches of water in the snow being measured.

In most States, the snow survey data are compiled from all the surveys by the Soil Conservation Service, which is the agency, through its Division of Irrigation, officially charged with the responsibility of assembling snow survey information, making forecasts and distributing the information to interested water users. Surveys are made as close to the first of the month as possible, and within a few days the latest information on the snow cover is in the hands of the waiting water users. The first report is on January 1 snow conditions and the last on May 1, that normally being the latest date when the maximum accumulation of snow may be measured.

EDITOR'S NOTE: *Western Construction News* initiates, in this issue, a water forecast summary for the 11 Western States. This article on how the forecasts are arrived at should be of interest to those in the construction and other fields who depend in any way upon the season's supplies of runoff or storage water. The data have been prepared by the Division of Irrigation, U. S. Soil Conservation Service, from statistics furnished by Federal, State, and private cooperative snow survey networks in Western States.

Finally, in order to get the complete picture of prospective water conditions, the snow survey information is checked against other water measurements and indicators, such as stream gage readings, and the most complete and accurate forecasts possible thus are formulated on the coming season's water supplies. In Oregon, for example, the final spring forecasts for the different water basins are made at a series of local meetings each April, with everyone having any pertinent information on the situation taking part.

For the whole Columbia Basin, the Columbia Basin Water Forecast Committee, composed of representatives from all States in that basin and British Columbia, meets in Portland after the middle of April and draws up the general Columbia Basin forecast.

Forecasts for 1945

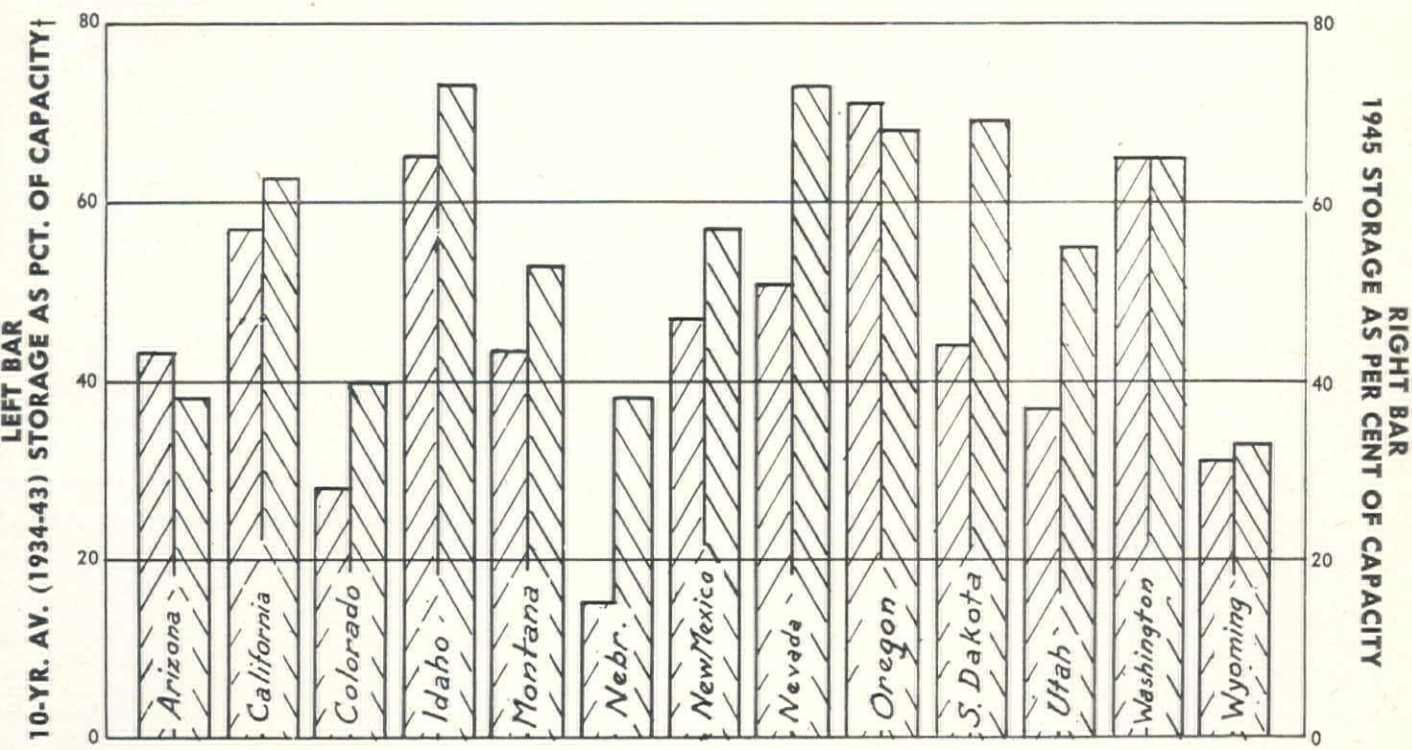
The following paragraphs summarize the prospects for 1945 runoff and storage, both as related to 10-year averages. The storage percentages represent major reservoirs for which 10-year periods are available, and are in terms of storage capacities.

Arizona: Runoff is expected to be subaverage ranging from about 70 per cent of the average for Gila River to 80 per cent for Salt and Little Colorado rivers. Storage is about 38 per cent of reservoir capacity. The 10-year average storage is 43 per cent of capacity. The 1945 storage is about 88 per cent of 10-year average storage.

California: Runoff will approach the average, ranging, by major Sierra basins, as follows (north to south): Pit, 91 per cent of average; Feather, 78; Yuba, 85; American, 88; Mokelumne, 96; Stanislaus, 98; Tuolumne, 106; Merced, 101; San Joaquin, 101; Kings, 100; Kaweah, 106; Kern, 104. Storage, as represented by 24 reservoirs over 10 years old, is 63 per cent of reservoir capacity. Average storage in these reservoirs is 57 per cent of capacity. The 1945 storage is 111 per cent of the 10-year average.

The 24 reservoirs represented by the preceding storage percentages do not include reservoirs recently created by Narrows (Yuba), Friant and Shasta dams. The present storage in 27 reservoirs including these three is 68 per cent of capacity.

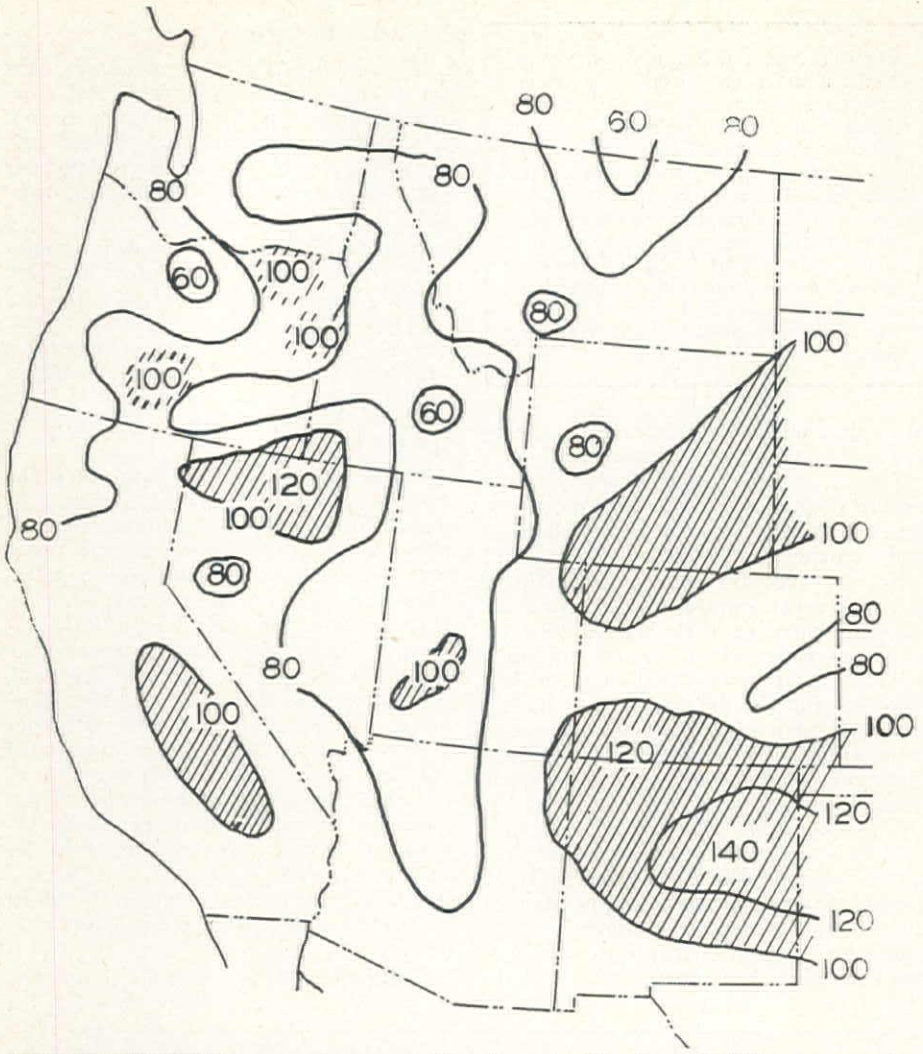
Colorado: Runoff will be about the



	Arizona	California	Colorado	Idaho	Montana	Nebr.	New Mexico	Nevada	Oregon	S. Dakota	Utah	Washington	Wyoming
Res. reported	7	24	46	11	23	2	3	6	20	1	14	7	9
Capacity of reported res. (1000 ac. ft.)	3366.1	3549.0‡	2446.7	4175.4	1629.7¶	2180.0	3238.7	1363.4§	2558.0	198.1	3173.3	1082.0	3887.5

RESERVOIR STORAGE AS OF APRIL 1, 1945*

*Not all reservoirs in all states are reported, but enough are reported to provide a reliable index of each state's storage supply. †Most state averages for reported reservoirs are for full 10-year period, but in a few cases reservoirs having less than 10-year records are included. ‡Does not include Narrows (Yuba River), Friant or Shasta reservoirs. April 1, 1945 storage in these three reservoirs combined is 3,020,200 acre-feet, which is 72 per cent of their capacity. ¶Does not include Fort Peck reservoir (capacity 19,000,000 acre-feet); April 1, 1945 storage 11,160,000 acre-feet. §Does not include Lake Mead (capacity 31,140,000 acre-feet); April 1, 1945 storage 21,236,000 acre-feet.



SKETCH SHOWING prospective stream flow from April to Sept. 1945 in per cent of normal runoff. Majority of states will have adequate water supply for current year.

same as the 10-year average, ranging by major basins as follows: Poudre, 85 per cent of average; South Platte, 85; Arkansas, 80; Purgatoire, 95; Rio Grande, 105; Animas, 120; Dolores, 100; Gunnison, 100; Upper Colorado, 95; White, 118; Yampa, 107.

Storage totals about 40 per cent of reservoir capacity. Average storage is 28 per cent of capacity. The 1945 storage is about 145 per cent of the average.

Idaho: Runoff will be substantially below average, ranging as follows: Kootenai, 89; Clark Fork, 76; Spokane, 71; Clearwater, 92; Salmon, 76; Weiser, 111; Snake (at Weiser), 81; Payette, 72; Boise, 82; Big Wood, 61; Big Lost, 74; Snake (at Heise, Ida.), 93; Snake (at Moran, Wyo.), 91.

Storage is 73 per cent of capacity. Average storage is 65 per cent of capacity. The 1945 storage is 113 per cent of average storage.

Montana: Runoff will be sub-average ranging as follows: Marias, 90 per cent of average; Milk, 55 per cent; Musselshell, 83; Jefferson, 87; Madison, 72; Gallatin, 87; Yellowstone, 80; Tongue, 100; Kootenai, 89; Clark Fork, 76.

Storage is 53 per cent of reservoir capacity. Average storage is 44 per cent of capacity. The 1945 storage is 122 per cent of average storage. Fort Peck reservoir on April 1 held 11,160,000 acre-feet, or 59 per cent of capacity, as compared with 1944 storage of 10,120,000 acre-feet, or 53 per cent of capacity.

Nevada: Runoff will be above average if gaged by April indications for Upper Humboldt and Little Humboldt, which were, respectively, 120 and 127 per cent of average. Records for other basins are shorter than 10 years, but as compared with 1944 runoff, Steptoe Valley shows a percentage of 102, Baker Creek 119, and Mt. Charleston 158. A percentage of 350 for Reese River is based on partial survey.

Rye Patch reservoir on Lower Humboldt is filled to its capacity of 178,100 acre-feet, this representing 421 per cent of the average storage since completion of construction in 1936. Six major storages are at 73 per cent of capacity, as compared with 51 per cent as an average. The 1945 total is about 145 per cent of the average. Lake Mead held 21,236,000 acre-feet on April 1, or 68 per cent of capacity.

New Mexico: Runoff will exceed the 10-year average, as follows: San Juan, 105 per cent; Chama, 110; Canadian, 130; Pecos, 140. Storage is 57 per cent of capacity as compared with a 10-year average of 47 per cent of capacity. The 1945 storage is 120 per cent of average.

Oregon: With few exceptions stream flow is expected to be below average, but in most cases not seriously so; 93 per cent of irrigated lands have good to fair water supplies in sight. Storage is 68 per cent of reservoir capacity, as compared with a 10-year average of 71 per cent of capacity. The 1945 storage is 95 per cent of the 10-year average. While 6 per cent greater than last year, the total is 14 per cent less than in either 1943 or 1942.

Utah: Principal watersheds show a water content in snow storage closely equal to the average of the last 10 years. Eastern Utah is somewhat short, as is northern Utah. There will be no critical shortage of water in any area. All storage reservoirs will fill, except Utah Lake and Bear Lake, both of which hold enough water to meet the demands of several seasons.

Washington: Runoff will be slightly sub-average, as follows: Columbia at Birchbank, B. C., 95 per cent; Columbia at The Dalles, Ore., 88; Chelan at Stehekin, 82; Chelan at Lucerne, 90; Okanogan, 94; Methow, 97; Wenatchee, 73; Yakima, 68. Storage in percentage of reservoir capacity is the same as the 10-year average—65.

Wyoming: Runoff will closely approach the 10-year average, major basin percentages being as follows: Shoshone, 96; Powder, 98; Belle Fourche, 100; Wind, 75; Sweetwater, 100; Green, 100; North Platte, 100; Laramie, 100. Storage is slightly greater (104 per cent) than the 10-year average, being 33 per cent of reservoir capacity; the 10-year average is 31 per cent.

Upper Bay Bridges Will Soon Be Relieved of Toll Charges

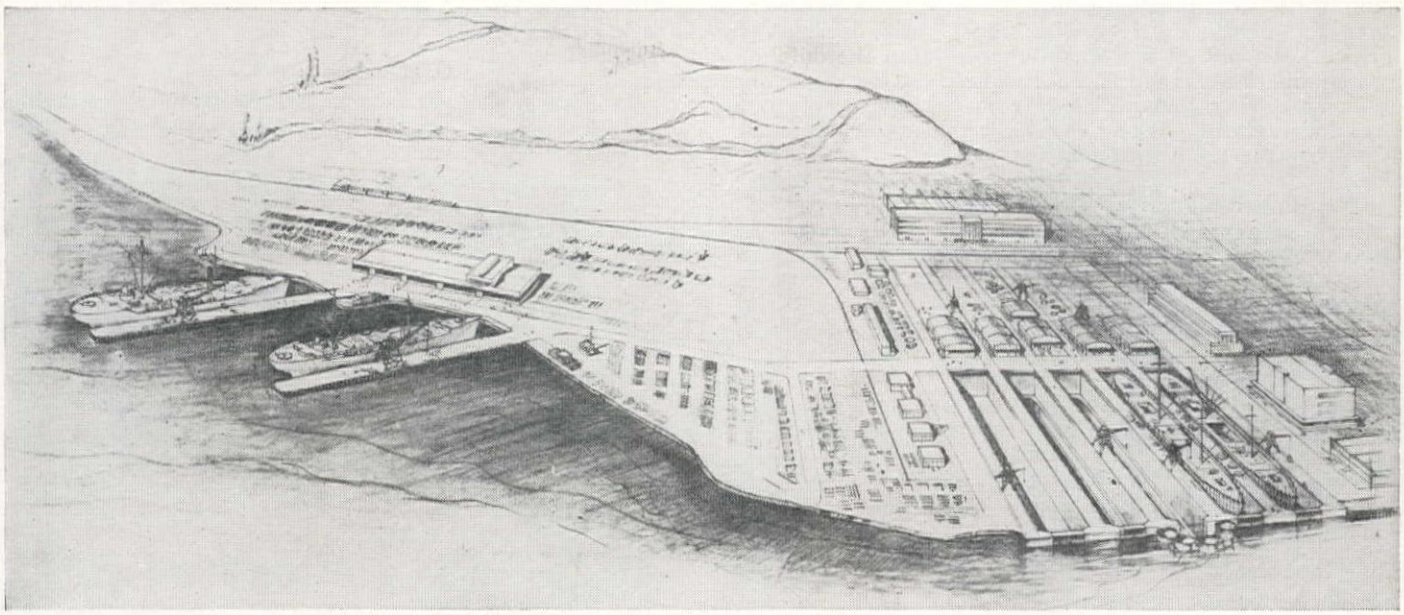
THE CARQUINEZ and Antioch bridges over the eastern arm of San Francisco bay and the Sacramento river, respectively, will no longer require toll charges after Sept. 1, 1945.

C. H. Purcell, California State Director of Public Works, stated in an announcement that both bridges, constructed during 1923, under a franchise issued by Contra Costa county, had been purchased by the State Toll Bridge Authority in 1940 from the American Toll Bridge Company at a cost of $5,500,000. Revenue from the bridges is approximately $120,000 each month, an amount nearly double pre-war receipts.

Winter Resort Suggested for Palm Springs Vacation Area

A POSTWAR WINTER TOURIST resort may be built on top of Mt. San Jacinto and overlook Palm Springs, Calif., if a proposed aerial tramway up the eastern slopes of the mountain receives favorable consideration by the state legislature. This bill, which is now before the legislature, provides for the creation of the Mt. San Jacinto Winter Park Authority and the sale of revenue bonds to finance the $1,360,000 project. The aerial tramway, planned by the engineering firm of Modjeski and Masters, would be built from Chino Canyon, would pass through several snow-laden valleys which are high up on the 10,700-ft. mountain, and would open up a winter sports haven for vacationists.

Shipyard Deepened for Repair Work



Kaiser Co. converts two basins at Richmond yard No. 3 to ship repair program, while continuing to build C-4 troopships

By JOHN H. BARTH
Kaiser Company, Inc.
Richmond, Calif.

DURING 1942 five graving docks were constructed at Shipyard No. Three of the Kaiser Company, Inc., at Richmond, Calif., for the construction of 18,500-ton C4 troopships for the United States Maritime Commission and have been continuously in use on this contract. However, recent developments in the Pacific War Zone have required additional facilities and dry docks for ship repairs at home ports, and, due to advantages of location, two of the five graving docks of Kaiser Company, Inc., Shipyard No. Three, are now undergoing deepening and remodeling to provide additional repair facilities under the Navy repair program.

Included in the program for repair facilities at Shipyard No. Three, in addition to remodeling of the two graving docks, is the necessary channel dredging, the construction of a quay wall for filled working area adjacent at the west to the graving docks, the construction of two concrete finger piers and a steel frame utility building 100 x 425 ft., and the installation of all required utilities.

The deepened graving docks will have a depth at high tide of 37 ft. to the floor and are 100 ft. wide by 587 ft. long inside of the gate caisson. At the gate, the breadth of the graving dock is 84 ft., with a depth at high tide of 34 ft. over the sill.

At the gate end of each of the two graving docks to be deepened a cellular steel sheet pile, rock ballasted, cofferdam is required so that the necessary changes to the graving dock sill can be made.

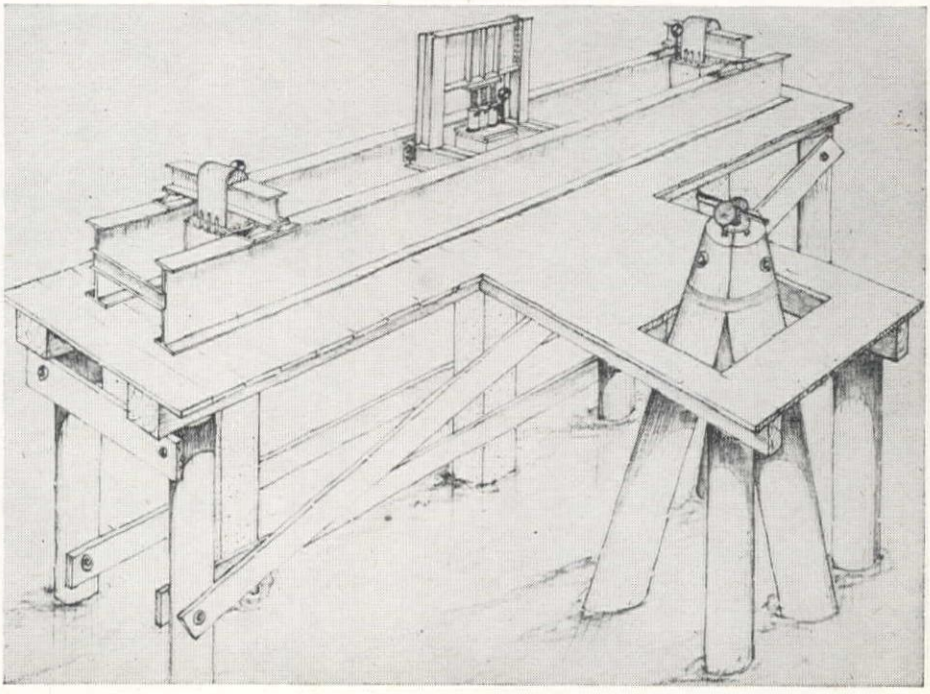
Excavation

At the site of the cofferdams the bay bottom is an irregular rock ledge overlaid by a blanket of soft mud two to six ft. in depth, and the cellular steel sheet pile cofferdam was chosen as best suited to this type of foundation. The bay mud was removed with a floating clamshell derrick, and a blanket fill of crushed rock ten ft. deep was placed over the cofferdam site to provide anchorage for the false work piles required to carry templates for the setting of the steel sheet pile cells, as well as to provide stability for the cells themselves until they could be completely filled with the crushed rock. The cell fill is of well-graded broken rock chosen to provide maximum stability.

Excavation in the graving dock is being performed by power shovel and trucks. The limits of the excavation are defined by line drilling to prevent disturbance from blasting operations of the rock foundation under the existing walls. Excavated rock is being used to construct a portion of the quay wall in the finger pier area.

Finger piers

The finger piers, providing additional berthing space, are 50 ft. wide by approximately 550 ft. long, each, constructed of



ARTIST'S SKETCH of Kaiser Co. Shipyard No. 3, above, showing basins to be deepened. Sketch of concrete pile test assembly, for piles of finger piers, right.

reinforced concrete and carried on reinforced concrete piles.

Each structure will carry a 60-ton Whirley crane and will be completely equipped with all utilities, such as A. C. power for lighting and welding machines, D. C. power for operation of ships' auxiliaries, oxygen and acetylene for flame-cutting and welding, compressed air, natural gas and water. The piers are protected with wood fender-piles.

In the finger pier area, preliminary investigation revealed an ideal foundation condition. A depth of water of 30 ft. below mean lower low tide is required at this point, and borings disclosed that soft bay mud existed to elevation -32, and that below this depth strong clays extended for at least 70 ft. To secure a stable shore in this area, the bay mud was completely dredged away, exposing the strong clays, and a rock fill quay wall was constructed. The area between this quay wall and the bank was then rock filled.

Piling load test

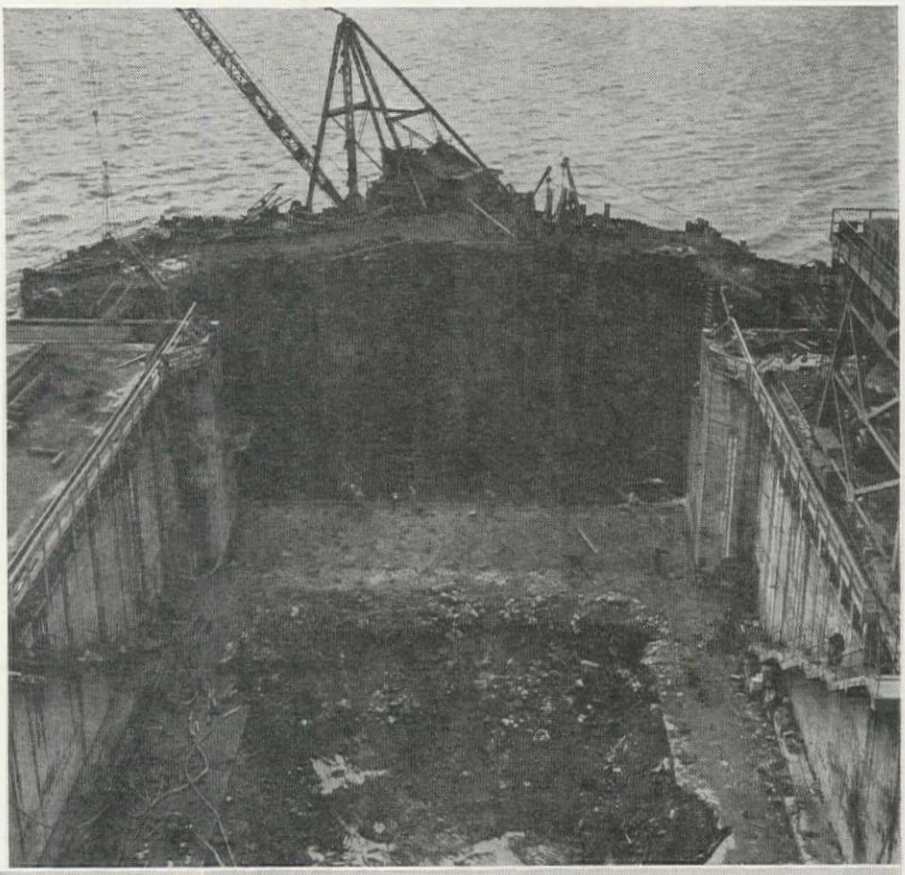
A pile load test was performed with the equipment indicated in the accompanying sketch. At the outboard end of Finger Pier No. One, three pre-cast reinforced concrete piles were driven, two tension piles and the test pile. Piles are at 12-ft. centers. The test pile was driven to a calculated 100 tons resistance with a No. 1 Vulcan steam hammer.

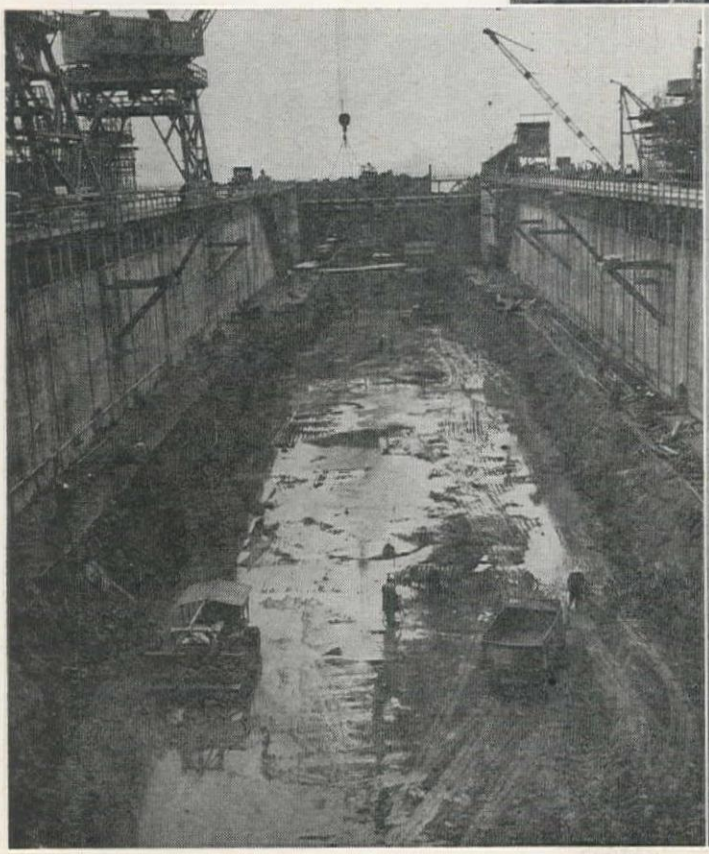
The jacking beam assembly was then placed and welded to bared rods of the tension piles, and the 2-in. steel plate set on a leveled grout on the test pile upon which were installed three 50-ton screw jacks. A surveyor's level was set atop the dolphin and targets placed at each of the 3 concrete piles. Loads at 10-ton increments were then applied at varying intervals by the jacks. Deflection indicating devices inserted between the jacks and the jacking beam assembly measured the applied loads. The pile load-test was conducted by Dames & Moore, consulting engineers of San Francisco.

Organization

The reconstruction in the graving

(Continued on page 108)





OUTBOARD END of deepened graving dock showing sheet pile cofferdam in place, right. Below, excavation progress on floor of graving dock, new ship construction continues in adjoining basin. Cellular sheet steel pile cofferdam at basin No. 3, lower.

Postwar Lumber—
Scientists Produce Many Variations

Through modification, unheard of uses have been discovered for wood — Laminating makes plywood stronger, more pliable and capable of withstanding any condition of exposure — Compregnated wood is highly moisture resistant and as strong as many metals

JUST WHAT CAN the construction contractor expect at war end, in six months, or a year thereafter, in the way of lumber?

To better understand the answer, it might be well for those of us who are not forest engineers or wood technicians to examine the properties of what Agriculture Secretary Wickard described as "That Wonderful Stuff Called Wood," in a recent *Saturday Evening Post* article. While Mr. Wickard and other contemporary writers aim at popular appeal, it is not surprising that a number of conservative construction men are beginning to envision postwar structures of incredible departures as measured by 1941 standards. Certainly the progress of wood chemistry is fascinating. Illustrations that accompany this study are ample testimony, but:

Basically, there is not much difference between the handle of a stone hammer and the expendable plywood belly-tank of a fighter plane, yet betwixt the two of them can be unrolled the known history of man. As far as forest products go, in both their uses and a complete understanding of their properties, man has yet to come out of the woods.

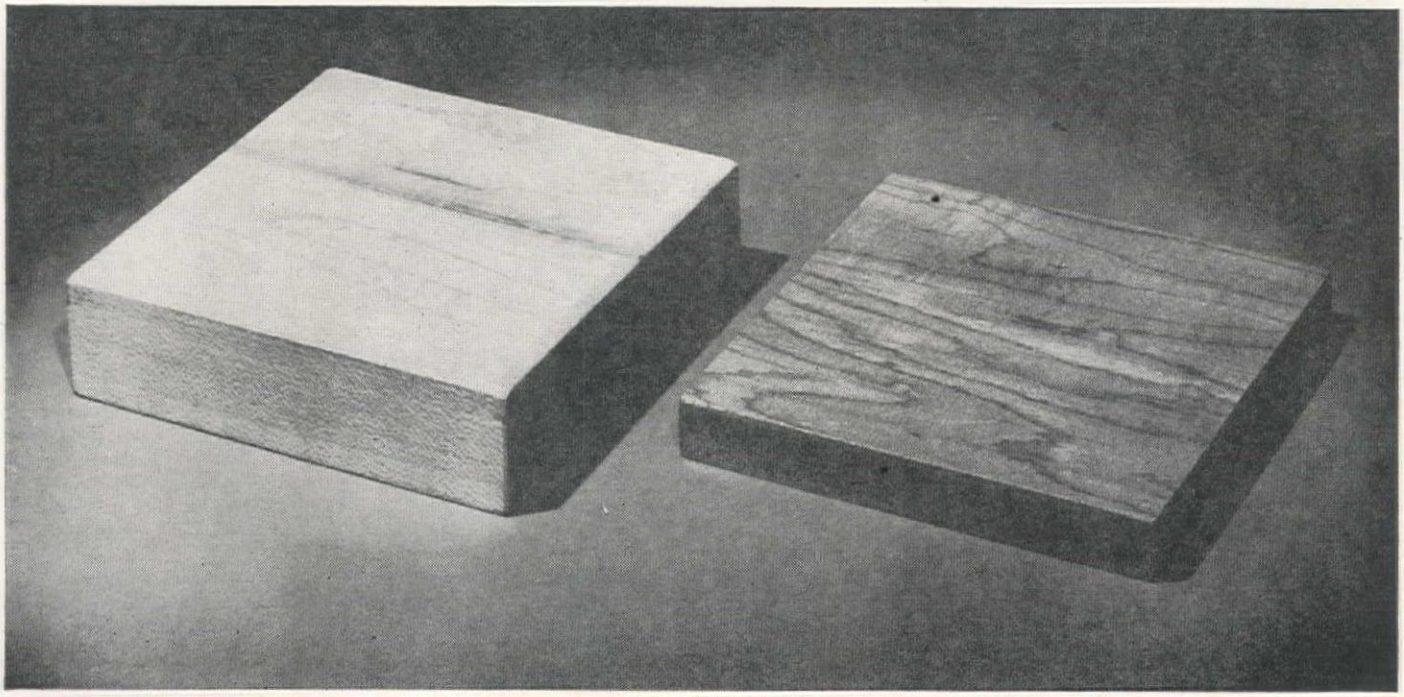
It is easy enough to say that wood is a lignocellulose compound made up largely of carbon, oxygen, some hydrogen, and a little nitrogen and mineral ash. In fact, by use of the electron microscope, and the analysis of X-ray spectra, the secrets of wood composition have been laid open to the arrangement of the last atom. As a result we find in wood a complex cellular structure that is the key to its behavior in response to any given set of external conditions.

Regardless of species, wood cells are of a fibrous nature, many times longer than they are wide. These cells are spliced, woven, and compacted in such a manner as to impart great strength to the parent plant. The interlacing of its organic components is superior to many familiar mixtures. In truth, weight for weight, a wooden beam is stronger than steel.

Sensational new material!

Suppose, for example, tomorrow's newspapers should announce "a new product . . . a material light in weight, which can be shaped and formed by hand or with high speed tools; which can support hundreds and thousands of times its own weight as a beam or as a column; can be used for framing the skeleton of structures; pre-cut by line production methods or fabricated to close tolerances at the site; which will serve in thin panels as a membrane for covering over hollow spaces; provide of itself a natural insulation against the elements of temperature, moisture . . . that will stand weathering for generations in its natural form, withstand the abrasion of countless footsteps and the impact of wheels; is easily treatable with a multitude of supplementary decorative finishes to suit the whimful tastes of the individual; would never rust or spall. . . . A material which can be sawn, turned, nailed, chiseled, carved, bolted, screwed, glued, bent, bored, sanded, stained, colored, painted. . . . What a headline that would make!" We have been quoting from a speech made by R. G. Kimbell, Director of Technical Services for the National Lumber Manufacturers Association, before retail dealers at a New York meeting last January. He was describing an ordinary piece of lumber.

Why then, this scientific rat race to make of wood something that is different? Well, as a construction material, wood has one great fault. It is hydroscopic. In a natural sense this is no



MAPLE, before and after stabilization by heat and pressure. Wood compressed across the grain and subjected to moisture and heat conditions is called Staypak. Some woods may be more than doubled in density and strength properties by this method.

fault at all; for if the cells did not have the ability to admit and to throw off moisture, the life processes could not exist. Trees were designed for living, and once dead, it was intended that they decompose and make room for new life. So when man refused to accept the branches as adequate living accommodations, and tried to convert the trunk into a house, he ran into trouble. The fact that early Colonial structures are still standing is as much an accident as it is a tribute to the durability of wood. The fact that they are still standing, however, suggests that there must be some natural reason why this is so. That indeed is the case, and by a simple application of these reasons, possible in every type of construction, wood can be made durable beyond any commonplace measure of time.

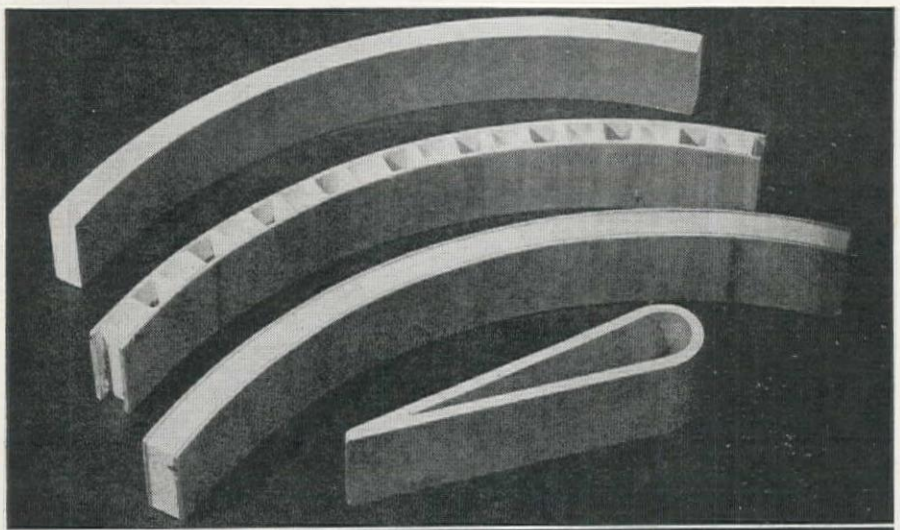
Water and wood

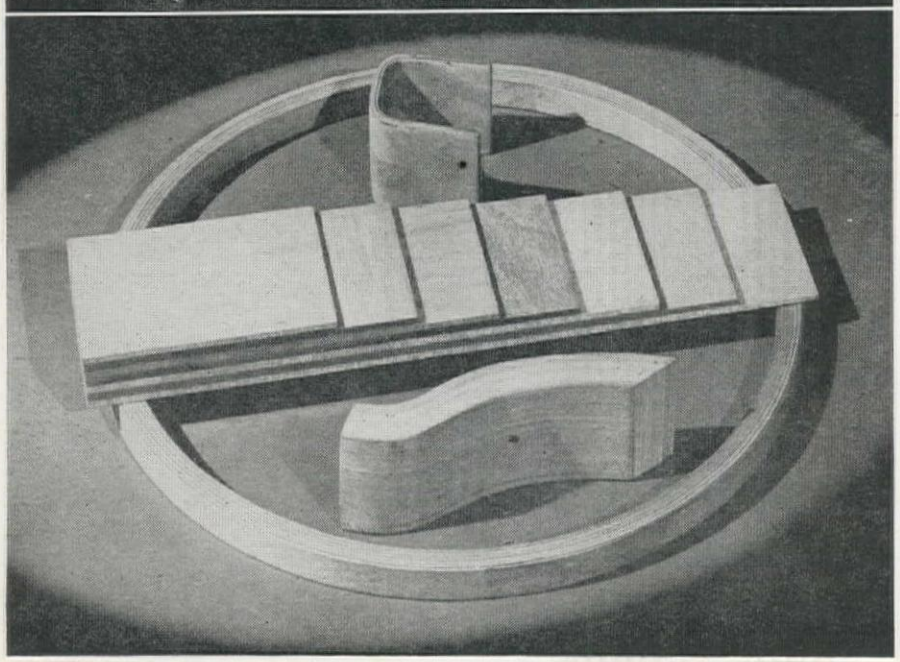
The hydroscopic property of wood permits the absorption of free water into the air spaces that make up about half its bulk. This movement of free water does not affect the stability, though it may provide adequate drinking water for hungry fungi or a chaser for thirsty termites. It is the movement of water within the cell walls themselves that causes swelling, shrinking, and attendant difficulty. Therefore, the denser the wood, that is, the more wood it contains in relation to air spaces, the more it is affected. Consider the plain example of a wet flower pot on a hardwood table. The stress set up by the turgid wood fibers may not be sufficient to warp a well-constructed piece, but when it eventually dries, the cells that collapsed under pressure do not take up as much room, and checks develop. This is called compression shrinking. Now, out of this gloomy picture comes the happy knowledge that every one of these adverse conditions can be prevented. If wood has served so well under haphazard installations, think what it can do under the application of technological advance!

One of the top advantages that will accrue to construction men of tomorrow from the processes identified with this war will be the use of expertly dried lumber stock. While it is true that green stuff went into many temporary structures, large quantities of thoroughly seasoned wood, even though freshly cut, had to be furnished for more exacting tasks, such as ponton lumber. The addition of chemical seasoning to dry kiln operation has achieved near perfection in the finished product. As pointed out by R. T. Titus, of the West Coast Lumbermen's Association, in an account appearing in the December 1944 *Western Construction News*, one method is the use of urea salts. Spread on green lumber, these salts hold the surface moisture in balance. Thus the interior dries simultaneously and avoids surface checks and splits of any consequence. Immediate postwar capacity to produce this well-seasoned lumber is estimated at half the anticipated total production, or somewhere around 15 billion feet annually. Depending on the demand or urgency, the rest will be air dried or green. This condition will prevail only until yard stocks can be built up. Kiln drying will be practiced for structural grades and larger pieces where the process is most important.

Beyond the matter of stability, there is another decided quality, since once properly seasoned, no matter by what method, lumber cannot pick up from the air enough moisture to rot or to feed insects in any western construction that provides even moderate safeguards of ventilation and avoidance of direct ground contacts. Pathologists tell us that dry rot is a popular fallacy. The fungus cannot operate in dry wood unless some part of the plant can draw on free water somewhere around the structure. Termites cannot exist without ground contact through their mud tubes, or a source of water in the wood itself. And seasoned wood simply does not contain enough water to sustain life of any kind. Water must be introduced by the use of green lumber or by faulty construction, and the emphasis is on the latter.

SANDWICH CONSTRUCTION, bonding of various materials, such as balsa wood faced with papreg, and an intricate core faced with plywood, enabling ordinary materials to be used more extensively. Below are examples of plywood moulded for special purposes.



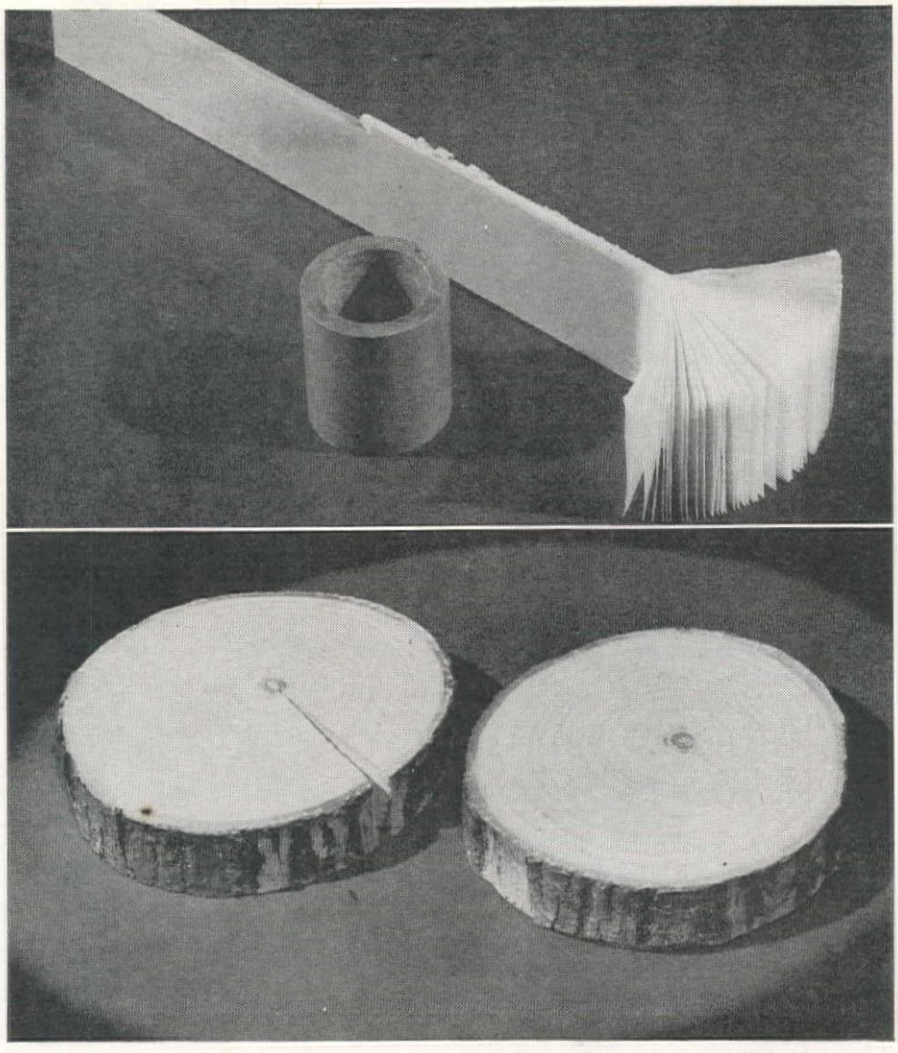


Not construction uses

For some industrial precision uses, not likely to be encountered in ordinary construction, even well-seasoned wood shows too much response, however small, to atmospheric conditions. Its water content tends to come into balance with the air around it, and since air cannot be controlled for all purposes, efforts have been made to control the wood through modification. The results of these experiments are the things you hear and read about. From here indeed have sprung the now widespread and spectacular possibilities.

Here, essentially, is the evolution of this basic process: The problem seemed to hinge around the microscopically fine surfaces inside the wood that have a chemical affinity for water. Since wood is about half air, there is plenty of room for water. Various coatings experimented with could not block this movement. Working with synthetic resins and other substances, it was found that most fillers have molecules larger than the air spaces they were trying to fill. So by breaking the resins down to their components, it

SHEETS OF PAPER impregnated with resin and subjected to heat and pressure resulted in a laminated paper product known as papreg, lighter, yet as strong as some metals. Below are samples of white ash, one checked in seasoning, the other chemically treated.



was possible to get the filler minute enough to make true impregnation and actually displace the air in the wood cells, thereby keeping water out. This process is carried out under heat, and during the period of heating the wood becomes rather plastic. Therefore, while the resin is being formed in the wood, the latter can be compressed to about ⅓ of its original volume. The resulting product, known as compreg, is hard and dense, having the same finish clear through, and a structural strength approaching that of mild steel, by volume. Remember the earlier statement that wood in its natural form was as strong as steel by weight.

Further refinements of this process can be obtained by using laminations and controlling the density to match tensile requirements of the end product. This is beautifully illustrated in the production of airplane propellors where a heavy density is used near the hubs and gradually brought to a light density at the tips. The propellor is just the right strength at any one point to withstand its calculated stress. Another development is "sandwich boards," featuring a tough hard surface with a light fibrous filler. Even paper enters this field. By use of phenol formaldehyde, a compreg paper can be moulded into products that are in a fair way to compete for many industrial uses.

We have gone into these new products with some detail simply to clarify their relation, or lack of it, to the construction man who is ready to embark on peacetime projects after V-Day. To summarize his picture then, it should be recognized that war urgency has permitted many field applications of laboratory-tested products. The extension of these applications—say a new binding agent of laminated pieces, for example—is not likely to find heavy production under a more restricted economy until there has been time to correlate laboratory tests with exposure and fatigue factors. We have the word of major lumber associations themselves, that the only thing a builder should expect, for some time to come, will be lumber, an improved product in its familiar form.

What can we expect?

It is altogether probable that pre-cut dimension stock, such as roof trusses, will be available; but prefabrication as such, is not headed for any early domination of the field. As to lighter construction, factory production of whole houses, while suited to mass erection on industrial sites, does not as yet seriously compete with the individuality and appeal of private construction. The majority of housing men argue that a house is not an automobile.

Laminated pieces for some of the larger members, or for decorative effects, offer early possibilities, as does a remarkably improved plywood that will admit wide sweeps of design under any condition of exposure. Compreg wood is headed for a place in utility installations, such as mill-worked casements, drainboards, maybe floors and decking. Some of these uses are economically feasible only in industrial plants with gradual extension to general construction in prospect. To put it another way, manufacturers have not forgotten that the more you "modify" lumber, the more it costs. At some point along the line competing products will temper this battle of the test tubes.

Whatever gets out of the laboratory stage and lands on the peacetime market will be thoroughly ready for its intended use. Meanwhile, if a lumber dealer should offer you a product that looks like lumber, go ahead and use it. It has been tested for hundreds of years. There is nothing the matter with it!

Grand Coulee Lake to Be Named as Memorial to Franklin D. Roosevelt

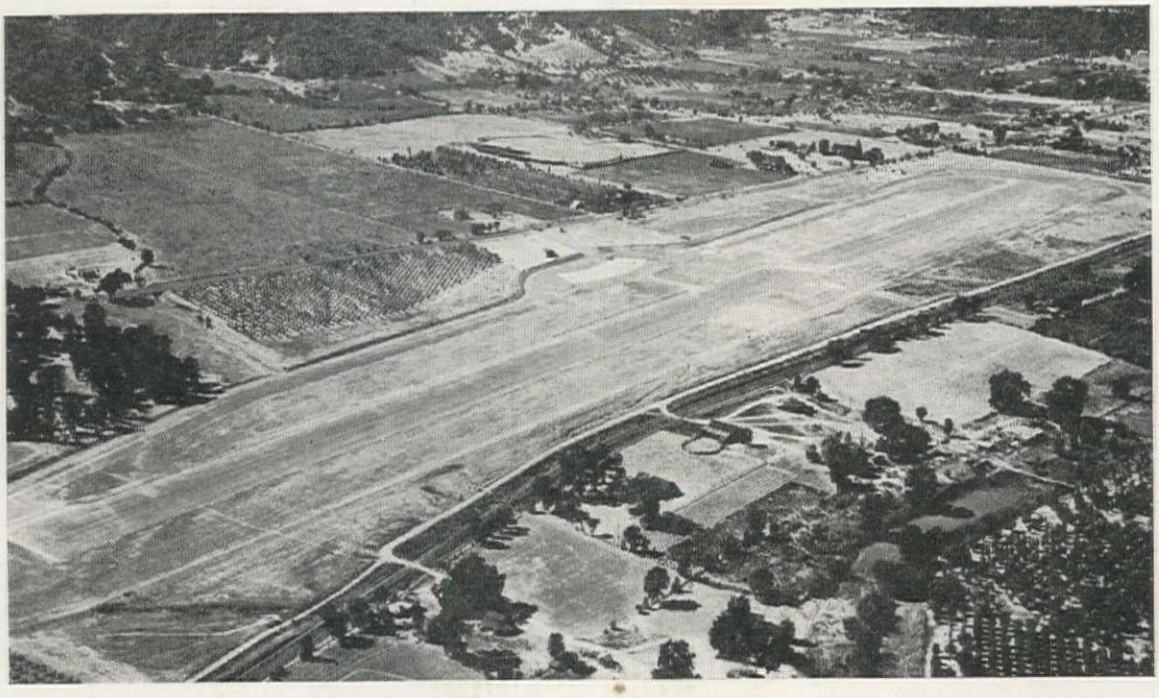
SECRETARY OF INTERIOR Harold L. Ickes has announced the naming of the 151-mi. lake formed by Grand Coulee Dam, in north central Washington, as Franklin D. Roosevelt Lake in honor of the late President.

Grand Coulee Dam, which formed this serene lake, was begun as a result of emergency funds allotted by Roosevelt in 1933. Two years later he approved a change in plans that made the dam the greatest in the world. In August, 1937, he visited the dam, spending a day inspecting closely the progress of the work and the plans for the development of the Columbia Basin project.

Acting immediately upon the proposal the United States Board on Geographical Names transmitted to Secretary Ickes its approval of the name Franklin D. Roosevelt Lake. The recommendation was made by the Division of Geography and concurred in by the Advisory Committee on Geographic Names at a special meeting. The official designation is:

"Franklin D. Roosevelt Lake: In Lincoln, Grant, Stevens, Ferry and Okanogan counties, Washington. The lake is approximately 150 mi. long, formed by the impounding of the Columbia River by Grand Coulee Dam, extending northward to the vicinity of the Canadian-United States International Boundary. Named after Franklin Delano Roosevelt."

Typical Small-City Airport



Ukiah, Calif. demonstrates cooperation of civic-minded citizens, local officials, and federal government in procurement of adequate facilities to handle inevitable postwar development in private and commercial aviation

By R. W. F. "BOB" SCHMIDT
Supt., Airport Service, Sixth Region, CAA, and Advisor to California State Aviation Project Committee

UNDER THE TITLE, "Planning the Town's Airport," an article by the writer appeared in *Western Construction News* for February, 1944, outlining the problems and requirements for a small-town airport. Given here is a good example of the operation of the principles outlined at that time.

The construction of the municipal airport at Ukiah, located in an intensified agricultural valley in generally mountainous Mendocino County of California, 105 mi. NNW of San Francisco, took but a few months and presented no unusual problems in the actual building. Work began December 15, 1941, and was completed September 3, 1942.

Unique in the development, however, is the long history of promoting and planning the project, which could never have been brought to culmination had it not been for the efforts of one City Councilman who has since become Mayor.

Although for many years, Ukiah had the questionable benefit of the conventional hayfield and windsock combination consisting of two rough landing strips, the longest of which was optimistically recorded as 1,725 ft. and both of which were badly obstructed, there was no real interest in aviation.

One warm day in the fall of 1938, having responded to a request for counsel at a point nearby in the Redwood Empire, the writer stopped at Ukiah to inquire as to any official display of interest in airport matters, and was told by a gas station operator and a county official that one Paul Poulos was probably the only person seriously interested. He envisioned Mr. Poulos as a private flier fighting an uphill battle for adequate facilities for his own use. Instead, Poulos turned out to be a man **who had never ridden in an airplane and who had no association with aviation in any way.** His enthusiasm was based entirely upon his own conviction that flying would play a big part in the development of his community.

Within ten minutes of meeting Poulos an investigatory auto trip was made about the valley from one potential site to another, through vineyards, orchards, hop fields, and pastures. It did not take long to determine that but one site had definite long range possibilities with economic limitations, even though it was obvious that outside help would be necessary to develop much of an airport. That site was the original hayfield with the windsock, although it was thirty-four months before the findings were conclusively confirmed by flight check in air carrier equipment.

An untiring enthusiasm

For nearly three years Paul Poulos talked, ate, drank, and slept "airport" as he convinced his fellow-townsmen of the need for providing for the Air Age to come. It should be noted that this was in 1939 and 1940, before stirring books like *Victory Through Air Power* had been written and when most persons in high places were as yet dubious about the future of any kind of aviation. In any event, Poulos triumphed June 23, 1941, when the then Mayor, A. L. Harris, advised the CAA Regional Office at Santa Monica that "the City of Ukiah is now willing to furnish necessary lands and to sponsor a project for development of the airport at Ukiah."

But the joy was short-lived, for, though the City was willing, the CAA had no funds available for allocation to the project. In the meantime, city options on requisite property were expiring, and it seemed for a few desperate weeks that the opportunity to secure the needed outside aid would be lost for all time.

However, at the last moment, the third Development of Landing Areas for National Defense appropriation establishing CAA's program "C" permitted the Airport Approval Board to allocate funds for a project at Ukiah to:

> "Clear, grub, grade, drain and fence field area; construct N/S landing strip with 150′ x 4000′ runway thereon; construct 4600′ of 50′ taxiway and apron 100′ x 300′; install basic lighting and contact light N/S runway."

On August 1, 1941, a formal offer was made to the City by the CAA, which resulted in passage of a resolution by the

City Council on August 13, 1941, calling for a special bond election to raise the balance of $56,000 needed for purchase of lands and sponsor's expenses. Poulos was not to be denied; his good work had its effect and the citizenry voted bonds with an alacrity which put many a larger community to shame. On Nov. 12, 1941, the City Council formally adopted the resolution legally qualifying the City as project sponsor, and the agreement with CAA was approved by its Administrator on Nov. 21, 1941. The U. S. Engineer Office at San Francisco, acting as constructing agency for CAA, had not been idle in running surveys and preparing plans and specifications. On Nov. 25, 1941, it awarded the general contract to Macco Construction Co., of Clearwater, Calif., and thus brought to a close the long struggle of salesmanship and persuasion which had taken Poulos over a rigorous course of site selection, financing, legal skirmishes, options, and momentary set-backs.

War changes things

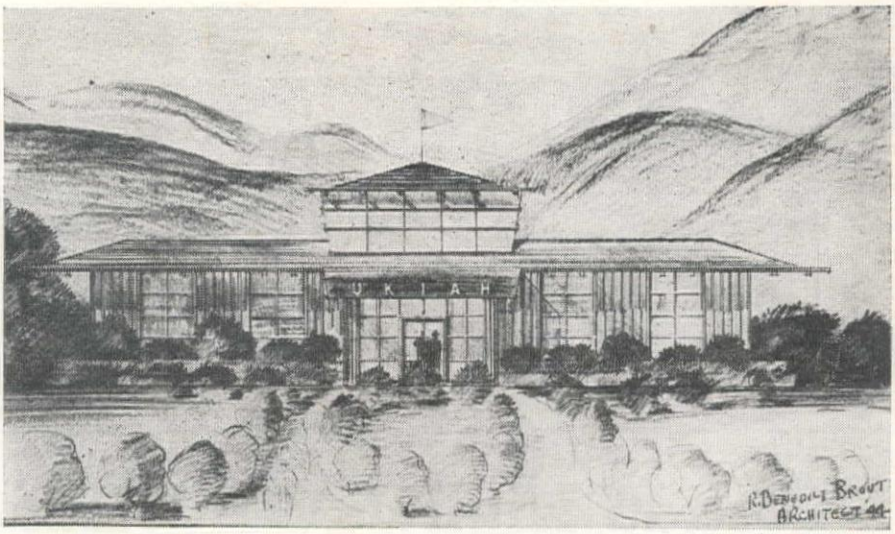
The morning of Dec. 7, 1941, caused millions of changes in plans. The Ukiah Airport, which was to have been the site for a homey CPT and private flier arrangement—yet capable of handling an air carrier operation up to and including DC-3's—lay deep in the 150-mi. combat zone from which all civil flying (other than scheduled carriers) was entirely eliminated for many months. Being situated in mountainous terrain, with the nearest landing area suitable for even emergency landings by military aircraft then almost 50 mi. distant, did not cause it to be coveted as an operating base, although it is practicable to extend the runway to accommodate larger equipment. For three years it has, in a sense, lain dormant, although several emergency and precautionary landings have been made by military aircraft which saved many times over the $284,000 Uncle Sam has invested in the airport.

Now, after six years, Ukiah expects to see fulfillment of the Mayor's dreams. With relaxation in civil flight requirements on the West Coast, now that the mad rush for the large cities has slowed, operators are beginning to consider the lush fields in hitherto relatively unexplored country insofar as aviation is concerned. Mendocino County, inspired by the leadership of Ukiah, sponsored a Navy-endorsed CAA project on the coast proper, 30 mi. to the westward. Construction of other airports to the north has opened the region by providing places for private fliers and air commerce to develop and expand. Ukiah stands at the gateway to all the vast recreational areas of northern coastal California, to its great timber and mineral resources, and to many varied agricultural pursuits.

Notwithstanding war-time restrictions, Ukiah found it possible to lay a water line to the field, which is situated within walking distance of downtown on U. S. Highway 101. A phone was installed and a house was moved in to serve as temporary office quarters for any initial operation. The City's enthusiasm about the future caused R. Benedict Brout, nationally known architect, to sketch preliminary terminal building plans designed in the redwood motif.

Ukiah is one community which has accepted the challenge of the Air Age. It is all set to accept anything aviation can offer to a community of like size, wealth, and relative location. Even with the cream of its young people gone to war, there are between fifty and sixty persons clamoring for an opportunity to learn to fly. There are ten or twelve who have stated they will buy aircraft; they are persons who have the money and determination to do it.

It is up to each of us in aviation and construction to see to it that the people in the Ukiahs all over this nation are not disappointed. They have believed—we have got to produce!



TERMINAL BUILDING design proposed by R. Benedict Brout, architect, for the Ukiah municipal airport. It is in the redwood motif, to harmonize with natural surroundings, and will house all necessary facilities. Construction will be in postwar.

HON. PAUL W. POULOS, mayor of Ukiah, Calif., who had never been in a plane, but saw the importance of having his city ready for the coming expansion in aviation.

Preliminary Plans for Umatilla Dam Announced

WHEN THE CONSTRUCTION of Umatilla Rapids dam gets under way four towns will have to be moved to make way for the 62-mi. lake behind the dam. Dikes as high as 20 ft. will carry highways and railroads and prevent inundation of lowlands.

At the widest spot, slightly south of Snake River, the lake will be 5 mi. across, extending 26 mi. above Pasco, 11 mi. up Snake River and 5 mi. up the Walla Walla River, which will also be backed into a small lake. The dam will flood an area of approximately 18,700 ac., making necessary the reconstruction of 87 mi. of railroad, 21 mi. of primary highway and 22 mi. of power line.

As a flood protection for 38,000-ac., 38 mi. of dikes or levees averaging 10 ft. in height are to be constructed on both sides of the river extending on the east side past Pasco and, on the west, beyond Richland.

A seepage problem now exists in the Kennewick area where pumps are to be installed to take out the water. At least one dam on the Snake River will be eliminated by construction of the 340-ft. high Umatilla dam, making that stream navigable as far as Lewiston, Idaho.

The Umatilla project will greatly reduce the high electric power rates now existing in southeastern Washington, where consumption of electric energy is ten times the output of local generating stations.

Decision has been made to name the new dam project after the late Sen. Charles R. McNary of Oregon, as a tribute for his unceasing interest in Columbia River development.

Irrigation of 164,000 ac. of the Horse Heaven project south of the Columbia River in Oregon, which lie between Umatilla and the mouth of John Day river, may be made possible as a result of the construction of the dam, Bureau of Reclamation authorities believe.

NEWS OF WESTERN CONSTRUCTION

MAY, 1945

Colorado Highway Advisory Contract Terminated by State

THE COLORADO State Highway Department entered into contract with the firm of consulting engineers, Crocker and Ryan, of Denver, in 1944, for the surveys, estimates and designs of a Valley Highway, to be known as "A North-South Limited-Access Highway Through Denver."

The original contract between the Highway Department and the consulting firm called for an estimated $100,000 to be spent for this work, which was to consist of three phases. The first phase was to consist of field surveys and working up general plans, which involved alignment, grades and location of structures. The second phase would include data relative to sectional designs, structural details, quantities and finished grades and alignment. The third phase was to have completed in detail all designs, quantities, specifications and estimates so that the project could be advertised for bids.

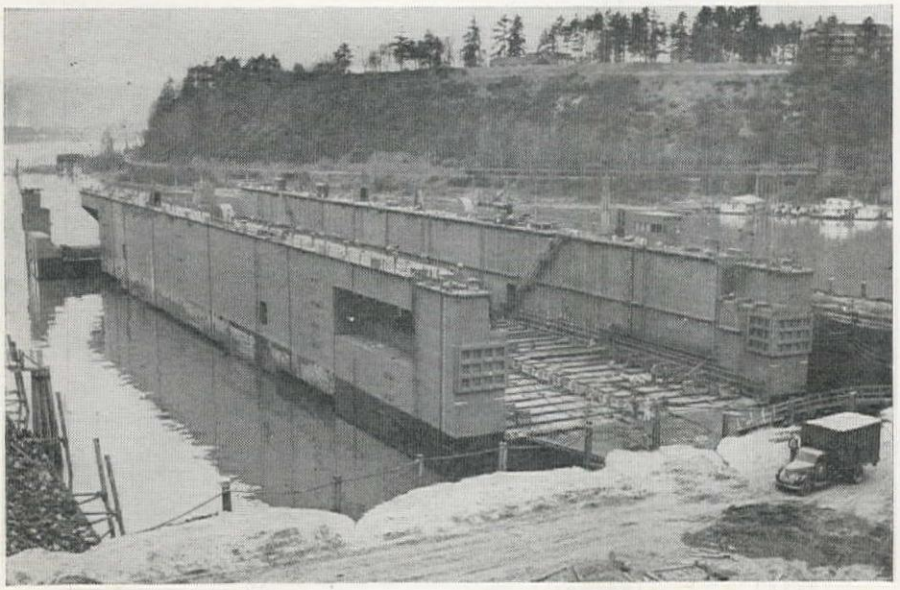
At the present time phase one has been completed and submitted to the State Highway Department. The State Highway officials do not concur completely with the designs relative to grades and structures. They have brought out, in addition, the fact that it is not feasible to complete the designs on such a project at this time because when the project is ready for construction, due to ever-changing designs in highways brought about by deviations in automobile design and variations in demand from traffic, the present plans might be obsolete.

The original estimate of $100,000—which was to cover the cost of phases one, two and three—was to be paid by Federal aid, in the amount of $56,560, and by the State, in the amount of $43,340. This $43,340 was to be advanced to the city and county of Denver and the same amount withheld by the State from Denver's gas tax fund.

At a recent meeting of the Colorado State Highway Advisory Board a unanimous vote was reached for the termination of the contract between the State Highway Department and the consulting engineering firm. This decision was reached after considering the highway officials' attitude toward the project from a technical standpoint, and the fact that the three phases of the engineering work would considerably exceed the $100,000 originally designated to cover the cost.

SECTIONAL DRYDOCK FLOATED INTO PLACE AT PORTLAND

A NAVY FLOATING DRYDOCK constructed in the Vancouver yard of the Kaiser Co., at Vancouver, Wash., was towed by sternwheel river boats (see cover) to Swan Island yard of the same company at Portland, Ore. It was constructed in three sections. The picture below shows two sections joined, and the third being moved into position. This is the basin at Swan Island where the drydock will be permanently moored for naval repair work.



Work on Anderson Dam Is Resumed

EARTH-PLACING operations have been resumed on the Anderson Ranch Dam to bring the elevation of the structure to a height sufficient to store water next spring for increased war food production in the Boise Valley of Idaho.

The 1945 work schedule calls for 2,000,000 cu. yd. of embankment to be placed during the 200 working days between now and the fall and winter rainy season, which each year halts earth placement. Last year, 1,600,000 cu. yd. were deposited. The placement of the new material in strategic portions of the dam, at the average rate of 10,000 cu. yd. a day, will permit storage of 45,000 of the ultimate 500,000 ac. ft. of water to be held in the reservoir. The storage will supplement the supply of the 400,000-ac. Boise Project, on which crop production is being restricted because of late season water shortages.

The structure, which when completed will be the highest earth-fill dam in the world, now contains 3,600,000 cu. yd. of clay, sand, gravel and rock, or about 42 per cent of the ultimate total of 8,654,588 cu. yd. The present elevation of the embankment at the highest point is approximately 250 ft. above lowest bedrock. The dam ultimately will be 456 ft. high. It will be 1,400 ft. long at the crest, 2,350 ft. wide at the bottom and will create a reservoir 13¼ mi. long in the canyon of the South Fork of the

Boise River, northeast of Mountain Home, Idaho.

Excavation for the spillway, to be located on the left abutment, is 88 per cent completed. The open-channel, concrete-lined chute will have a maximum discharge capacity of 20,000 cu. ft. per sec. and will be 339 ft. high.

The outlet works, which will control the elevation of the reservoir and direct water into a proposed 27,000-kw. power plant, is 69 per cent completed. The intake structure is under construction and will be placed in use as soon as storage is started. The South Fork is now diverted around the dam site through a portion of the outlet works.

The work on the spillway, inlet works and in the reservoir was continued throughout the winter. A small amount of pervious material has been placed in the last few weeks but wet weather has prohibited resumption of full scale operations on the impervious center section.

Material for the center and impervious section of the dam is being transported from a high borrow pit 1¾ mi. on a 36-in., eight-ply, rubber, electrically-powered conveyor belt. Its capacity is about 900 cu. yd. an hour. After the material has been dumped at the dam, shovels load it into trucks which transport it to the placing zones. There it is compacted by 20-ton sheep's-foot rollers under a pressure of 450 lb. per sq. in.

Construction is being carried on jointly by the Morrison-Knudsen Company, Inc.; J. F. Shea Company, Inc.; Ford J. Twaits Company; and Winston Bros. Company. H. F. Bahmeier is construction engineer in charge for the Bureau of Reclamation.

Colorado, Kansas Agree On Use of Caddoa Water

AN AGREEABLE war-time plan for the division of Caddoa dam storage waters between users in Colorado and Kansas has been reached.

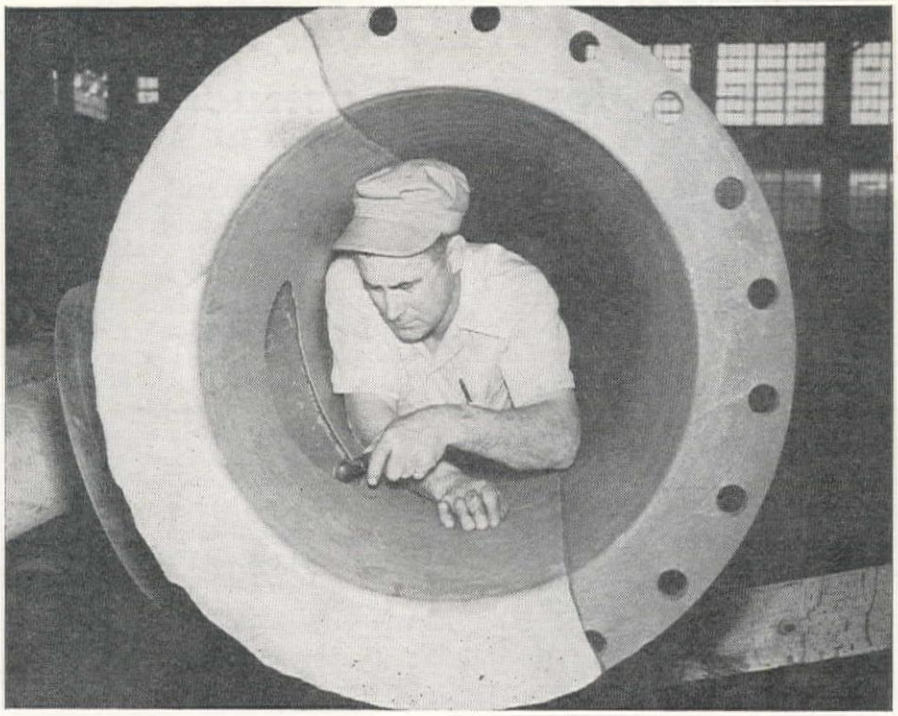
During the first 15 days that storage waters are released on the Arkansas river, Colorado users will receive 500 cu. ft. per sec. and Kansas users will receive 250 cu. ft. per sec. delivered at the state line.

Water will be released to Colorado users as they need it after the 15-day period, and Kansas users will have an equivalent supply delivered at their state line.

M. C. Hinderlider, Colorado state engineer, has been named water release administrator and will relay the requests of the users to U. S. Army Engineers who are in charge of the reservoir.

A federal representative is to be appointed soon, to serve on the commission, now comprising four men each from Colorado and Kansas.

After the war, gates are to be constructed in the dam, enlarging its water capacity. The reservoir now contains 52,852 ac. ft. of water which is expected to amply supply needs during the coming growing season.



WORKMAN APPLYING the rubber lining to a metal pipe which will be used for aromatic acids in the Dow Chemical Co. plant at Pittsburg, Calif. The new process protects the metal from corrosion. Rubber is applied in long strips, $\frac{3}{16}$ in. thick, and cured in place by heat from steam pipes. Openings are cut out before heat is applied.

Rubber Lining for Acid Tanks Prevents Corrosion of Metal

ENOUGH RUBBER to make 2,300 passenger tires was used to line two 50,000-gal. acid-containing tanks at the Dow Chemical Co. plant in Pittsburg, Calif. The project, which was completed last month, is unusual in the size of the tanks and the amount of rubber used. Over 10 tons of rubber was applied.

The technique, perfected under war-time necessity, protects the metal tanks from the corrosive action of acids which otherwise would destroy the tanks in a comparatively short time. The specially compounded synthetic rubber is particularly resistant to corrosion by aromatic fuels, acid and water. As a protective coat it lengthens the life of the tank, and in contrast to other coverings, can easily be repaired.

The Navy has utilized the technique to cover the walls and ceilings of submarine battery rooms which are subject to acid corrosion. The result is that the danger of structural deterioration, due to the corrosion, has been entirely eliminated.

Due to the enormous size of the tanks, a method of applying and curing the rubber in the field was devised by technicians of the United States Rubber Co. Instead of the usual factory equipment, the tanks became their own curing ovens in this field vulcanizing system. Steam coils were fitted into the tanks and these furnished the heat to cure the rubber. Curing time was 48 hours.

Previous to this operation the synthetic rubber was sent to the tank sites in long strips, 3/16 in. thick. These were applied after the inside surfaces of the metal tanks were sand blasted and covered with a coating of bonding cements, which assure a perfect bond between the metal and rubber by chemical reaction.

After the cement, the rubber strips were applied and rolled with hand rollers. The seams, between the strips, are bevelled to insure perfect unity. When set they are stitched with a wheel similar to a notched glass cutter.

According to J. S. Milne, District Manager of U. S. Mechanical Goods Division, the new technique makes this rubber application available wherever it is needed. The new Dow tanks are 20 ft. in diameter and 20 ft. high. Both carry hydrochloric acid in varying solutions. The Austin Company were the contractor-engineers of the job.

RECENTLY Willis and Eph Spurgeon were able to complete an irrigation ditch begun 59 years ago by their father, using equipment furnished by the San Francisco Soil Conservancy District. The irrigation ditch was started in 1885, on the Spurgeon farm near Reserve, New Mexico, but was abandoned after a short time due to solid rock along the bed of the Frisco River.

To complete the 100-yd. ditch situated near the bridge across the Frisco River on the highway to Silver City an air compressor and jack hammers were used to drill the rock so that it could be blasted.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—The water treaty with Mexico was ratified by the Senate on April 18 by a vote of 76 to 10, thus terminating months of bitter debate and long hearings nominally before the Foreign Affairs Committee, although usually only 3 or 4 members of the committee were in attendance. No reservations offered by any opponents of the treaty were adopted. Those against the treaty lost both the water involved and all safeguards. Votes were cast against the treaty by Johnson, Downey, Chandler, Wherry, Shipstead, McCarran, Langer, Younger of North Dakota, Wheeler of Montana and Moore of Oklahoma. It will be recalled that several months ago this column predicted only nine votes would be cast against the treaty.

On April 17 a large number of reservations introduced by pro-treaty members were adopted by the Senate, including modifying autocratic control by the International Boundary Commission and placing of ultimate policy and financial determinations and some administrative procedures under the control of Congress. The wings of the State Department were moderately clipped.

It is estimated that the water Mexico gets prevents forever, under present technology, the ultimate addition of 20,000,000 to 30,000,000 population to the West slope. Potential failure is attributed in Washington to error in judgment in formulating the original presentation of what water means to the arid West. Neither the overwhelming majority of senators nor their eastern constituents even faintly realize that they are giving away water that spells life or death to the socio-economy of the West slope.

Reconversion

President Truman obviously will move slowly. Although VE-Day has at last been reached, VJ-Day appears much more distant. There is yet no disposition to permit the Army to release any appreciable facilities or working manpower. WPB and WMC and OPA have not yet worked out with the War Mobilization and Reconversion Administration a teamwork plan for more civilian production of any kind.

WPB might plan to release some materials and relax some controls, but WMC is very slow in relaxing manpower controls, and OPA makes WPB potential plans difficult by holding tight on present price ceilings. Apparently no responsible observer in or out of Government anticipates any serious reconversion action that will affect construction of any kind for at least six months, and six months is regarded as almost pure optimism. Above all, it is hoped to avoid public works on a work-relief basis. No responsible construction leader here suggests any cancellation of controls is even in sight.

The situation is described as tight. An effort will be made to get some time schedule when spot authorization may be applied to construction—not to wipe out controls or to secure abrogation of regulations, but to use the spot authorization system to relax controls without abrogation, slowly, almost informally, so they may be resumed when and if necessary. There is considerable fear that abrogation of controls would mean extraordinary inflation. Apparently American and rich refugee speculators are heavily buying real property, as well as jewels and plate.

Figure out the answer yourself.

Authority hearings begin

The keystone of all proposed Authorities, the MVA, has been brought under initial discussion by Congress before a subcommittee of the Senate Commerce Committee. If, eventually, establishment of series of Authorities is legally enacted, these and subsequent hearings will determine whether Authorities will be created under the Ickes plan, the Rankin plan or the plan of the Water Conference Committee. The Ickes plan places Authorities under the Department of the Interior and emphasizes power; the Rankin plan makes Army Engineers dominant and emphasizes flood and harbor works; Water Conference Committee emphasizes states' rights coordinated with federal aid and funds flowing from cooperation of Army engineers, Bureau of Reclamation, Department of Agriculture, Power Division of Interior Department, and Federal Power Commission.

On April 13 the Water Conference Committee addressed a letter to all U. S. senators and congressmen demanding that the plan be adopted. The demand was signed by 21 water associations, representing all parts of the nation.

The Ickes Authority plan

The Ickes plan is not a program for one specific Authority; it seeks to create the federal agency which will "establish and maintain a broad program of unified water control and resource development for the nation's major rivers, their tributaries and drainage basins, together with surrounding territories; and that in carrying out such a program the fullest possible use shall be made of the advice, assistance and cooperation of the people of the affected regions, and their public and private organizations—local, state and federal. The use of waters in states lying wholly or in part west of 98th meridian shall be subordinate to any beneficial consumptive use, present or future, for domestic, municipal, stock water, irrigation, mining or industrial purposes."

The over-all federal Authority is to be called the River Basin Development Board, composed of the Secretary of the Interior, the Secretary of Agriculture, the Chief of Engineers, the Chairman of TVA and the administrators of the Regional Authorities created under the plan, as well as all chief executive officers of every like Authority created by Congress.

Each Authority is to have an administrator, appointed by the President, with the advice and consent of the Senate, at a salary of $12,500 a year. The Secretary of the Interior is to direct and supervise the activities and the operations of the Authorities, and is to act as the intermediary between the Authority and Congress and the President. Each Authority is to have a Valley Advisory Council.

Each Authority is empowered to do everything necessary to control and prevent floods; to promote navigation by improving river channels and stream beds, and to provide terminals and other navigation facilities; to reclaim arid, semi-arid, swampy, wet, logged off and cut-over lands; to safeguard public health, sanitation and public welfare by supplying municipal water, providing sewage disposal, water purification works and abate pollution; to make the widest use of water power by federal works . . . in short, to produce electric energy and to bring it to existing or potential markets; the Authority also is to open mineral resources, develop industries, and build demonstration or pilot plants; and to conserve natural resources for recreation, to protect fish and wildlife; the Authority also is to develop resources of the forest, range and soil, afforest or reforest denuded lands and combat soil erosion.

The proposed law would give an Authority the power to sell electric energy to federal agencies, states, counties, districts, municipalities, corporations, cooperatives, partnerships and individuals. It is specifically ordered to encourage the widest possible use of electric energy, to provide adequate markets and outlets for power, and to prevent monopolization by limited groups or localities.

Electricity is particularly to be made available to domestic and rural consumers; and in disposing of the electricity preference is to be given to federal agencies and then to states, districts, counties and municipalities and their subdivisions. The Authority is authorized to establish rates for the sale of electricity. It may assist those who buy electricity to construct, improve, maintain and operate distribution lines and other facilities; it may buy and operate and extend electric utility systems and analogous facilities; and it may lease facilities for operation and may sell electric energy at retail through its distribution facilities.

It is quite clear the production of electrical energy and its distribution, at the lowest possible rate, through public agencies or through private agencies rigidly controlled by the Authority, is one of the major, if not the major, objective of an Authority.

Plan covers everything

It is a declared purpose that an Authority shall exist to provide family-type farms and make the tenure of settlers more secure. The size of a farm in

the Authority jurisdiction is to be fixed by the administrator in accord with his findings as to type of production and similar considerations. When a maximum area is prescribed, owners of lands whose individual holdings exceed the maximum must agree for themselves and their heirs and assigns to sell their excess lands at a value appraised by the Authority; and they must give the Authority irrevocable power of attorney to sell in their behalf the excess lands. For twenty years after the bill becomes law veterans of this war shall have a 90-day preferred right to purchase lands made available for settlement by the Authority. The Authority has the power to provide buildings and structures on any farm lands. It also may acquire or build plants to supply chemicals for military purposes and to make fertilizers, and to supply these products to farmers and farm organizations. It has the power to sell crops, trees, grasses and all related products.

Each Authority will be a corporation; will be authorized to issue, sell or exchange bonds, notes and similar evidences of obligation; and will be empowered to use the revenue to defray the costs of its various enterprises. The bonds would be made to mature in 50 years. Each Authority will be exempt from taxation, federal or otherwise. A system of payments in lieu of state and local taxes is indicated.

Under the proposed law, no dam, sewer, dock, pier, wharf, bridge, trestle, landing, pipe, building, float or other different obstruction affecting navigation, flood control, public health or public lands may be constructed or maintained along, across, in or over any stream or watercourse **except in accordance with regulations prescribed by the Authority.**

Columbia Valley Authority

As now prepared, the Ickes Authority Bill concludes by creating the "Columbia Valley Authority" with all the powers conferred by the proposed general act. The Columbia Valley Advisory Council would consist of nine persons, one member from each of the states of Idaho, Montana, Oregon, Washington, and Wyoming. The other three would be appointed from the region at large. Each member would serve three years, receive $25 a day; be reimbursed for travel expenses and receive $10 a day in lieu of subsistence expenses. The administrator, ex officio, would be chairman of the Council. And the general supervision would be vested in the Secretary of the Interior who, likewise, would be the channel through which the Authority and its officials must reach the Congress and the President.

The Ickes Bill undoubtedly will become the principal subject of discussion in connection with the establishment of Basin developments. It will present the unique situation of a conflict between the friends of Reclamation and the agency which has charge of Reclamation. Apparently, organized bodies sponsoring the interests of reclamation will actively oppose the Ickes Bill as well as the whole principle of the Authorities. The chief basis of disagreement appears to stem from the Ickes' emphasis on cheap power under public control, as well as the creation of more TVAs. Over 31 states are now banded together as the Water Conference Committee, which has its offices in the headquarters of the National Reclamation Association and of which Floyd Hagie, secretary-manager of the association, is also secretary.

Local control for Central Valley?

The long and continued battle between Ickes and California officials and congressmen flared anew with the fuel cast upon the smoldering blaze by San Francisco's Congressman Franck R. Havenner, who represents his metropolitan district more specifically than he represents the state. Havenner, a congressional retread, apparently is not very sympathetic with the aspirations of other Californians who seek to remove the Central Valley project from the danger of being made into another federal Authority. It appears a number of Californians, state officials and others, met at Fresno late in January to discuss means of rescuing the Central Valley from Ickes by again converting it into a state project. They formed the California Water Council and planned to employ some capable men to revive the state project at Sacramento, in Washington, and in fostering a knowledge of the plan among the people of California. The program was formulated to operate on a budget of $38,000 a year, which is peanuts in comparison with the present scale of expenses for comparable endeavors. Successful accomplishment of the program would mean another bond issue of, say, $400,000,000 added to the $170,000,000 which was authorized by the State of California in 1933, but which could not be adequately marketed at that period of the lowest ebb in the economic health of the nation.

It would, obviously, be no trick at present to sell 600 million or even a billion dollars worth of bonds backed by the credit of the very rich State of California. Mr. Ickes and Mr. Havenner wrote each other letters and Ickes wrote a letter to Gov. Warren, which implied that there was something doubtful about the expenditure of $38,000 a year on such a campaign, and one might also gather that it would be a mortal sin to attempt to yank the Central Valley project from the sheltering arms of Ickes. The Secretary of the Interior wrote Gov. Warren that the Federal Government would relinquish its financial responsibility, and Ickes would renounce his godfathership for Central Valley, only if the State of California could "buy out the investment of the Federal Government" of $157,000,000 and "finance the remainder of the project and related works." Sec. Ickes also served notice "before we hand back these responsibilities to the state, we feel sufficient evidence should be presented to prove the willingness and ability of Californians to shoulder the burdens of this great enterprise." In other words, godfather Ickes will require a very detailed and elaborate and explicit demonstration of good faith and ability and moral soundness before he lets go this pet project, designed as one of the most dramatic examples of the Ickes type of federal authority. Unlike Congressman Havenner, Congressman Johnson of the San Joaquin Valley, thinks California should have an opportunity to control its own Central Valley community, and has introduced a bill which would enable California to take over the project on terms that will distribute the financial burden over a reasonable period of time. When and if this bill comes before Congress for discussion, Mr. Ickes undoubtedly will appear to tell the members of Congress why the problem is none of their business.

Ickes also is locked in a Homeric struggle with both houses of Congress over his effort to grab California's tidal lands by assuming the right to grant permits to drill for oil in the tide flats off the shore of Southern California. A dozen or more identical bills have been introduced in both houses confirming the titles of states to tidelands and lands beneath navigable boundaries. Ickes' claims are held to endanger state and private titles to unestimated values in shipyards, warehouses, piers, harbor improvements, wharves, and similar installations and properties in all states with waterfronts built on reclaimed lands. Texas, Louisiana, Florida, Mississippi, Alabama and California would be deprived of colossal values in underwater oil wells.

Miscellaneous

It is reported by responsible sources that the Surplus Property Board has transferred disposal of consumer goods and construction and phone equipment from the Treasury Procurement Department to the Commerce Department. Under the Department of Commerce the probability is that direct sales units may be organized throughout the United States.

The slight strain in the relationship between the Corps of Engineers and the organized non-government reclamation interests seems to have been abated. The Engineers recently were placed in possession of $20,000,000, more or less, for immediate expenditure on civilian rivers, harbors and flood control work. Some of the work will naturally be done in the West. The Bureau of Yards and Docks was given $114,300,000 for public works construction, of which a substantial volume also will be beyond the Rockies. Public Roads Administration has approximately $30,000,000 to spend immediately on access roads and strategic highways. About two-thirds is intended for access roads and the other third for the strategic highways. Federal Works Agency has been given $20,000,000 to spend after June 30 for new community facilities.

British Columbia plans rural electrification at a cost of $50,000,000 of which $10,000,000 is to be provided by the Provincial Legislature, according to the U. S. Department of Commerce.

Convert Shipyard

(Continued from page 98)

docks is being performed by Kaiser Company, Inc. Diamond drilling for anchor rods in the graving docks was performed by the Daniel G. Longtin Company, while suction dredging in the finger pier area was completed by the San Francisco Bridge Company's dredge "Duwamish" and quay wall and fill construction was done by the Macco Construction Company.

Finger piers are being constructed by Morrison-Knudsen Co., Inc., and H. H. Larsen Co. is constructing the utility building.

Yard piping is being installed by Macco Construction and installation of electrical distribution and communications is being performed by Emerson-Newberry Company, Inc.

All foundation investigations were performed by Dames and Moore, consulting soil mechanics engineers, and L. H. Nishkian is consulting engineer for the graving dock deepening.

Complete Aerial Map of California Recommended

RECOMMENDATIONS for the aerial mapping of California through a cooperative program by the Federal and State governments are contained in a report released April 9 by the State Reconstruction and Reemployment Commission. The report is the result of studies made by the State Aerial Mapping Project Committee of the Commission, of which Olaf P. Jenkins, State Geologist, is chairman.

The report states:

"Full development of California's natural resources in postwar years requires the use of modern, aerial mapping methods. The program recommended by the committee which studied this subject contemplates the matching of all State funds by Federal funds on a fifty-fifty basis.

"Of California's total of 158,693 sq. mi., less than one-half is now covered by adequate basic maps. Unmapped and inadequately mapped areas represent nearly two-thirds of the State's area.

"In addition to being useful to all citizens of the State, adequate topographical maps would invite outside capital to make investments in California, because such maps are the prerequisite of all engineering enterprises.

"Practically all of the money expended on the proposed mapping will go into employment channels. This presents an opportunity for returning service men with engineering training to obtain permanent, useful employment.

"Another advantage of aerial mapping is the time element. If California hopes to take early advantage of postwar development of natural resources, adequate maps must be ready soon. Aerial photography greatly shortens the time necessary to complete the maps."

The report points out that recently many new and practical methods have been developed in mapping from aerial photographs which not only take far less time in constructing topographical maps, but which are more accurate and in greater detail.

New Priority Permits Lining Of Continental Divide Tunnel

IN A REVERSAL of its previous decision, the War Production Board has reinstated manpower priorities for the concreting of the Alvah B. Adams tunnel, the 13.1-mi. diversion bore of the Colorado-Big Thompson project. With the renewal of this work, it is anticipated that it will be possible to deliver water on the east slope of the Rockies by mid 1946. The tunnel itself was completed last summer, being the longest tunnel ever driven without adits.

Excavation cost $6,800,000; concrete lining to an interior diameter of 9 ft. 9 in. will cost another $3,000,000. The same firms which drove the tunnel are proceeding with the lining work, S. S. Magoffin Co. working from the east portal, Stiers Bros. Construction Co. operating from the west portal.

ARIZONA UTILITY ADVANCES ADMINISTRATIVE PERSONNEL

IMPORTANT CHANGES have been announced in organization and responsibilities of executives of Central Arizona Light and Power Co. LOUIS K. DOUTRICK, (left), chief engineer, is made vice-president and general manager; GEORGE H. GROH, is now chief engineer and general superintendent; A. F. MORAIRTY, (right), is placed in charge of public relations, postwar planning and industrial development. MILTON G. SANDERS, not pictured, is advanced to post of general sales manager.

OBITUARIES . . .

Lee A. Barley, electrical engineer, died recently at his home in Denver, Colo., at the age of 72. For the past thirty-five years he has been chief electrical engineer for the Mountain States Inspection Bureau. He was a charter member of the Western Electrical Association, and was also a member of the Board of Fire Underwriters.

* * *

Lt. Comdr. J. H. Bradtz of Pasadena and La Jolla, Calif., was recently killed in the crash of a Navy transport plane near San Francisco. He was an aeronautical and civil engineer, graduated from California Institute of Technology. At the time of his death he was serving as post engineer for the Seabee base at Camp Parks, situated near Oakland.

* * *

Alfred Reitherman, 37 year old construction and aircraft engineer of Sierra Madre, Calif., was killed recently in a plane crash near Wilmington, Ohio. He had organized and headed the Sierra Aircraft Construction Co. and since 1940 he had been associated with Sparton Aircraft Corporation of Tulsa, Okla., as executive engineer.

* * *

George H. Starbuck, engineer in the right of way and land department of Southern California Edison Co., died March 8 at his home in Los Angeles. He was a veteran of 31 years of service with the Edison Company and had held numerous positions of responsibility.

* * *

Charles B. Kirch, mining and construction engineer of Pasadena, Calif., died March 22. He was a native of Brooklyn, N. Y. and had served as a geologist and construction advisor in the Army Engineers most of his career.

* * *

Sidney A. Lake, aged 61, chief engineer with the Dominion Construction Co., Vancouver, B. C., died suddenly, March 17, at his home in Vancouver, B. C. He had been with the Dominion Construction Co. since 1921 and served during the last war as officer in charge of camp construction in British Columbia.

* * *

A. B. Macbeth, engineer of Pasadena, Calif., died in a Los Angeles hospital, March 21. He was serving as trustee and treasurer of the California Institute of Technology, and formerly was general manager and president of the Southern California Gas Company.

* * *

William W. Evans died April 7 at the age of 88 years at the Sawtelle Hospital in Los Angeles. He was a retired construction engineer and veteran of the Indian wars.

* * *

Walton W. Gill, civil engineer in the office of the Alameda, Calif., County Surveyor's office, died April 3 at the age of 47. He had been with the organization for the past 19 years.

PERSONALLY SPEAKING

Brig. Gen. Philip G. Bruton has been made Pacific Division Engineer of the Corps of Engineers, with headquarters in San Francisco, and also Service Command Engineer for the Ninth Service Command, and as such will maintain offices at Fort Douglas, Utah. He succeeds **Col. Edwin C. Kelton,** who retired from the double post on April 15, because of ill health. Col. Kelton was formerly district engineer in Los Angeles, and was also in charge of all Army Engineer work on the Pan-American Highway before coming to the post of Division Engineer. He is widely and very favorably known throughout the West. Gen. Bruton is a native San Franciscan, but has served the Corps of Engineers in many eastern districts, notably in the Newfoundland district, where he was awarded the Legion of Merit.

* * *

Three recent changes in personnel at the Sacramento, Calif., district office of the U. S. Engineer Department are as follows: **Forrest Varney** has been transferred to Fresno, where he is in charge of all U. S. E. D. construction in the San Joaquin valley; **Carl W. Thomson** has left the district to become an associate engineer in the Public Works office at Mare Island Navy Yard; **Owen G. Stanley, Jr.** is now employed with the Southern Pacific Co.

* * *

Ellis L. Armstrong, Bureau of Reclamation engineer on Anderson Ranch dam in Idaho, has been transferred to the Denver headquarters of the Bureau, where he has been assigned to the earthfill dam design department. Armstrong was the author of an article dealing with construction at Anderson Ranch, which appeared in *Western Construction News* for August, 1944.

* * *

Charles Gilman Hyde, retired professor of the University of California, and **George L. Sullivan,** dean of engineering at Santa Clara University, have been selected to supervise a county-wide sewage disposal survey in Santa Clara Co., Calif. Field work is being performed by the staff of **Clyde C. Kennedy.**

* * *

Charles B. Elliott, associated with the Bureau of Reclamation for the past 29 years, has been named chief of the division of Irrigation and Operations in District III of the Bureau, with headquarters at Boulder City, Nev. Most of his experience has been on the Uncompahgre project in Colorado and the Yuma project at Yuma, Ariz. He has been at Boulder City for the past six years.

* * *

Maj. Joseph C. Walters, formerly a civil engineer with Morrison-Knudsen Co., Inc., Boise, Ida., was recently named chief engineer for the Central Air Depot Area in France. His home is in Whitefish, Mont., and for the past several years he has been building bomber and fighter bases in this country.

* * *

John Quiner, for 10 years on the staff of the city engineer of Eugene, Ore., has resigned to become assistant city engineer of The Dalles, Ore.

BRIG. GEN. PHILIP G. BRUTON

Alvin A. Johnstone, a superintendent for J. S. Barrett Co., of Newport Beach, Calif., has been loaned by that organization to the Orange County Outfall Sewer District, to act as supervising engineer during construction of a new outfall sewer system for the cities of Anaheim, Fullerton, La Habra, Placentia, Brea, and Buena Park. **E. P. Hapgood** is project engineer.

* * *

Arvid K. Reed, junior member of the Seattle and Alaska contracting firm of A. Reed & Son, has been promoted to the rank of Major in the Corps of Engineers. He is chief of the fiscal division of the Seattle District office.

* * *

Ted C. Buck has been appointed president of the Coachella Valley Water District to succeed the late **Dr. Harry C. Forbes. E. Keith Farrar** will succeed Ted Buck as vice-president, **J. H. Snyder** is chief engineer, and **Bernice McGovern** is secretary.

Theodore D. (Ted) Overton, formerly production engineer with the Chemurgic Corp., at its Turlock, Calif., bomb plant, has accepted the position of Managing Editor of *Western Construction News,* succeeding **Dr. Maurice A. Buckley,** who is now associated with George S. May Co. Overton has had wide engineering experience in the Western states and in South America. He has been associated with C. V. Isbell Construction Co., of Reno, Nev.; Radich & Brown, Standard Oil Co. of California, and government construction agencies.

* * *

Irwin E. Burke is senior engineer for the Navy on the new San Diego Aqueduct, with offices at Vista, Calif. **Oliver E. Lillard** is office engineer, **Sam Burke** is chief concrete technician, and **H. J. Jenewin** is southern district engineer.

* * *

Capt. Harry Foster, formerly of the construction firm of Foster & Carroll of San Diego, Calif., and until recently resident engineer for the Corps of Engineers at Fontana, Calif., is now serving overseas with the Army Engineers.

* * *

Charles A. Reed, office engineer of the Oakland, Calif., street department for the past 28 years, has been appointed assistant city engineer. He replaces **Mel Auerbach,** who died last February.

* * *

Floyd M. Jensen, an engineer of the Bureau of Reclamation, has been assigned to Buffalo, Wyo., where he is engaged in project planning work.

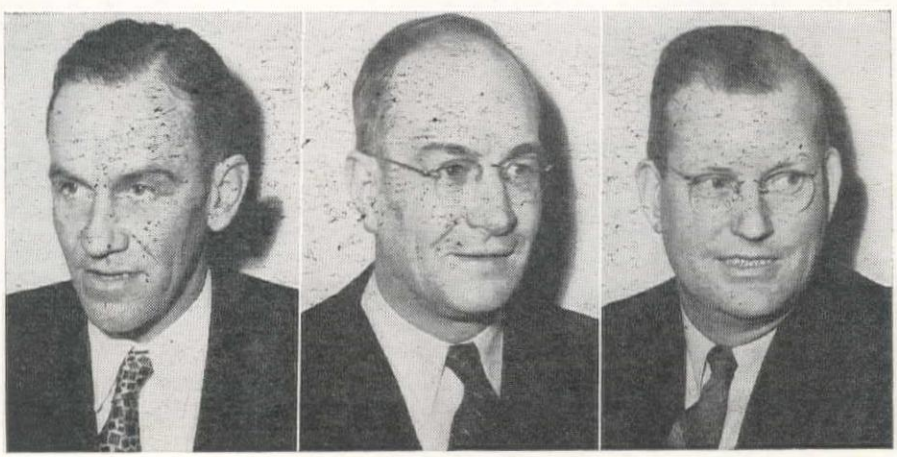
* * *

Alfred L. Trowbridge, manager for California Water Service Co., at Bakersfield, Calif., has been appointed chairman of the Kern Co. Planning Commission.

* * *

A. C. Goerig, formerly in the general contracting business at Seattle, Wash., has opened offices at 550 Lucerne St., Los Angeles, Calif.

RAY W. McLEESE, left, newly appointed chief engineer of the Utah State Road Commission. He was formerly district engineer at Price. W. L. ANDERSON, formerly chief design engineer for the Commission, center, has become assistant to McLeese. RAY H. LEAVITT, right, was named at the same time to the position of Chairman of the Commission. There has been no chief engineer since 1941, when E. C. KNOWLTON resigned.



SUPERVISING THE JOBS

Leonard W. Jones is project manager for the Shannahan Bros. for the construction of additional magazine facilities for the Navy at Fallbrook, Calif. **Richard Malone** is office engineer, **Richard W. Payne** general carpenter foreman, **E. E. White** is construction engineer, and **John G. Sherman** field engineer for this project. **Johnny Card**, formerly with Concrete Ship Constructors, is carpenter superintendent. **Albert Toner** is mill foreman, and **Linden Peterson** is carpenter foreman. **Clarence W. Allen** is concrete superintendent, with **Ted Langan** in charge of grading, and **Harry W. Stitler** is master mechanic. **A. Jones** is in charge of railroad construction, **Seth Moody**, paving; **Harold Atkins** is office manager, and **Seth Parker**, auditor.

* * *

E. F. Edwards is project manager and **Walter Peterson** is general superintendent for the Manson Construction & Engineering Co., Seattle, on their job at Lake Washington Canal Lock for the placement of a treated timber fender pier. **Bill Royer** is construction engineer on the job, **Ole Rundmark** and **Gurmar Langaker** are foremen, while **Gordon McLellan** handles the office manager's position.

* * *

W. F. (Bill) Rennebohm is general superintendent for the J. F. Shea Co., Inc., Los Angeles, on the Coachella project, with headquarters at Mecca, Calif. **Henry Ewert** is general foreman, **F. F. (Tex) Smith** is foreman on the day shift, and **H. L. Johnson** operating engineer. **Johnny A. Rein** is second shift superintendent. **Phil Glasser** and **Adolph Kuhl** are operating engineers on the project. Both of these men recently returned from a three-year assignment in Persia. Commissary service is provided by Lows Commissaries, with **Louis Schirm**, manager.

* * *

James R. Johnson is project manager for United Construction Co. of Winona, Minn., for the construction of Pier No. 6 at the Navy Dry Docks at Terminal Island, Calif. **J. A. Lowe** and **Wm. Buehler** are superintendents, **Wm. Mansell** is carpenter foreman, and **J. S. Trotter** is engineer for the project. **Leonard Hoffland** is master mechanic in charge of shops and maintenance.

* * *

Hector Goudesune is superintendent for Fred D. Chadwick on the $109,776 contract awarded to pave the open storage areas of the Army Air Force Supply Depot at Maywood, Calif. Chadwick himself is project manager.

* * *

MARK BRISTOL

Mark Bristol has been selected as superintendent by Alfred J. Hopper Co. on their $187,782 contract to construct five barracks at the Naval Supply Depot, Oakland, California. **Art Hallstrom** will be carpenter foreman, and **V. L. Walker** contract manager, for this job.

* * *

Jack Loveday, formerly construction superintendent of recreation buildings for the San Diego Naval Hospital, is now supervising the erection of an addition to Dana Junior High School at Point Loma, Calif. **George R. Nethery** is general superintendent and **Marion Hauser** is foreman on this $265,000 project, awarded to L. P. Scherer-T. C. Prichard, of Redlands, Calif.

* * *

John Bergum is superintendent for the Carson Construction Co. of Helena, Mont., on their 80-family dwelling units to be constructed in Pocatello, Idaho. **S. H. Harding** is office manager, **Fred Saalback** chief engineer, and **Hank Tougas** transport director for this $187,000 job.

* * *

O. J. Harryman, formerly job superintendent for the construction of a civilian war housing project in San Bernardino, Calif., is now supervising the erection of an $80,000 reinforced concrete warehouse building located at 122 So. Gary St., Los Angeles. **E. R. Hall** is foreman of this job, being constructed by M. J. Brock and Sons, of Los Angeles.

* * *

W. C. Bradbury is superintendent for James I. Barnes Construction Co. of San Francisco on a $1,453,000 aircraft hangar job, located at the Naval Air Station, Alameda, California. **Raymond Anderson** is assistant superintendent on the project.

* * *

Norman C. Smith, formerly superintendent for the Tooele Ordnance Depot paving project, is now supervising the installation of a film storage and cold storage vault for the Ogden Air Depot, Ogden, Utah. **Robert Gordon** is foreman on this $50,000 job for the R. J. Daum Construction Co. of Salt Lake City.

* * *

C. S. Hale, formerly reported as division engineer for the U. S. Bureau of Reclamation Coachella Canal project, with headquarters at Coachella, Calif., will be assisted by the following engineers: **Carl Huskinson** and **George W. Skoog**, as office engineers; **K. D. Bonebrake**, in charge of canal surveys; **Roy McNeil**, in charge of construction surveys; **L. D. Pardin**, chief inspector; **Albert D'Alessandro**, laboratory engineer, and **Bertram L. Ulrey**, in charge of general surveys.

* * *

E. M. Manning is superintendent for the Robert McCarthy Co., San Francisco, on their $245,000 job of constructing a gymnasium and swimming pool for the Letterman General Hospital in San Francisco. **Don F. Needham** is office engineer and **Herman Koepff** is general foreman for this job. Manning and Needham were formerly associated in similar positions on the Vallejo housing project.

* * *

John Egyed was appointed superintendent by Monson Brothers, San Francisco contractors, for their $120,000 job of firesafeing measures and site improvement to an Oakland building project.

* * *

Bert Dale is superintendent and **Carl Cline** foreman for the construction of 15 double frame and stucco dwellings at Ocean Park district of Los Angeles. This work involves a $100,000 contract, awarded to J. Willoughby Howe.

* * *

Jack McPhee is superintendent of the construction of 100 temporary housing units being erected by Del E. Webb Construction Co. of Phoenix, at Alzona Park, Arizona. **J. B. Hale** is purchasing agent for this $257,000 project.

* * *

Frank H. Dunn, well-known construction superintendent for the Dodge Construction Co., of Fallon, Nev., is supervising the work of installing rocket facilities at the Naval Auxiliary Air Station at Fallon. **George Eckman** will be in charge of the gravel plant and **Lew Peck** will run the hot plant on this job.

* * *

F. L. Somers is manager and **Myles Philbin** general superintendent of the construction of a $151,000 pumping plant at Klamath Falls, Oregon. The contract was awarded to the Tru-Mix Concrete Co., of Medford, Oregon.

* * *

H. Fred Watts, project manager, and **R. W. Stookey**, field superintendent, are in charge of the construction of a hospital at Camp Carson, Colorado Springs, Colo. **W. L. Steele, Jr.** is office manager on the $150,-

000 job, awarded to James B. Kenney of Denver.

* * *

Charles Lentz is superintending the prefabrication of 2,000 houses, which will be shipped to Britain, by the Wesco Construction Co., and Drycemble Corp., Houston, Texas. **Wm. Purcell** is plant superintendent of this $3,000,000 project.

* * *

A. E. Kirsten is superintendent, **Jay Reynhart,** foreman of underground construction, and **D. M. Stone,** electrical foreman for the installation of floodlights on the quay wall at the Naval Air Station, San Diego, Calif. Stetson Electrical Co. have this $112,000 contract.

* * *

Harold Lee Becker will supervise the construction of earthwork and structures at the Deschutes Project, located about 30 mi. north of Bend, Oregon. **Robert Bowen** and **O. C. Christensen** will assist on this $101,000 project, awarded to United Construction Co., Seattle, Wash.

* * *

Paul J. Scroggs is project manager for Peter Kiewit Sons Co. on their Homoja housing unit at the Naval Air Station near Santa Ana, Calif. **Ray McClarrimon** is general foreman for this job.

* * *

Harry Abbot is job superintendent and **W. A. Jost** is office manager for F. B. Pacheco, Tucson, Ariz., contractor who is building an elementary school for the El Rio Park Section of Tucson, Ariz. This project will involve $57,000.

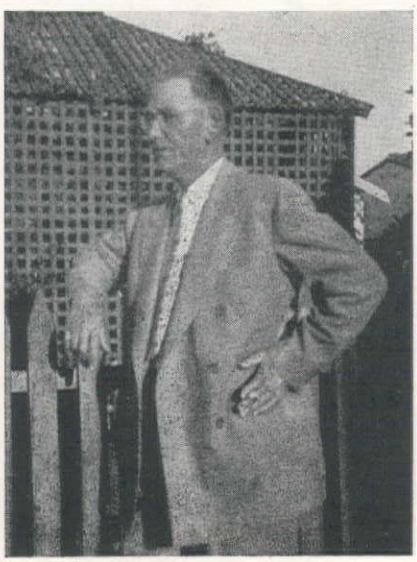
* * *

Carl Daniels, formerly superintendent of building construction for Stolte, Inc., of Oakland, Calif., at Camp Parks, Shoemaker, Calif., is now supervising a housing project for the same contractor. The new job is for $365,000 at U. S. Naval Advance Base Personnel Depot, San Bruno, Calif.

* * *

C. S. Gormaly is general superintendent for J. S. Barrett, contractor, of Newport Beach, Calif., on stabilization and shoulder area work at North Island, Calif. **A. J. Morell** is timekeeper and **W. R. Pratt** is master mechanic.

C. S. GORMALY



TOM CARR, left, superintendent for Morrison-Knudsen Co., Inc. on rebuilding Santa Fe Railway bridges west of Topock, Ariz., with GEORGE SCHIEVE, carpenter superintendent on the job.

* * *

Cal A. Cook, formerly a superintendent with Haddock Engineers, Inc., at Oceanside, Calif., is now operating a new rock and aggregate processing plant in Lawrence Canyon, Oceanside. The new concern is known as the Lawrence Canyon Materials Co. **Keith Roberts** is office manager.

* * *

H. O. Warp is job superintendent for Morrison-Knudsen Co., Inc., Boise, Ida., on their contract to lay new ties and ballast for 19 mi. of railroad which connects Prineville, Ore., with the main lines. **Bob Obucina** is foreman and **Paul Moehlenpah** is office manager for this work.

* * *

J. T. (Bill) Ford, formerly shop foreman for Guy F. Atkinson Co. at Seal Beach, Calif., is now in a similar capacity for Herbert H. Everist of the firm of Kiewit-Johnson-Everist, contractors at March Field, Calif.

* * *

Andrew Johnson is job superintendent for the construction of a $52,889 reinforced concrete viaduct on East 30th Street in Seattle, Washington. The contract was awarded to Rumsey & Company of Seattle.

* * *

Charles J. Stark, for many years connected with Bechtel-McCone Corp., is now superintendent of equipment for the same company at their new shops located at 4410 Santa Fe Ave., Los Angeles, Calif. **Clark Schellhaas** is shop foreman.

* * *

Fred Vinton is resident engineer for the Magnolia Manor Water Reservoir project of Seattle, Wash., **Mr. Carlson** is excavation superintendent for L. Coluccio, Seattle contractor, on this work.

* * *

John J. Swigart, formerly for many years in a key position with the P. J. Walker Co., is now operating as an excavating, grading and paving contractor in the old Basich location at 20530 So. Normandie Ave., Los Angeles. **M. L. Bowler** is office manager for Swigart.

* * *

L. Paul Fiorito is project manager for Northwest Construction Co. on their grading and housing unit at Renton, Washington. **Mr. Lockridge** is FHA resident engineer for the project.

Roscoe O. Dietrich is general foreman for the Bryce Trucking & Contracting Co. of Wilmington, Calif., for the construction of roads at the El Toro Marine Base near Santa Ana, Calif.

* * *

Damon Pederson is superintendent for C. T. Dracus, sub-contractor placing concrete on the Magnolia Manor Water Reservoir Project in Seattle, Wash. **Tom Hulling** is concrete foreman for Dracus.

* * *

Roy Sewell, for many years a key man with the firm of Hazard & Sons, San Diego, Calif., is now superintendent for the same concern on all work at the plant of Consolidated Aircraft Co. in that city.

* * *

C. A. Budnik has been appointed field superintendent for the Maxon Construction Co., Inc., of Hastings, Neb., to supervise the construction of a $6,250,000 magazine area for the Naval Ammunition Depot.

* * *

Stolte, Inc., of Oakland, Calif., has appointed **Peter Vander Haak** superintendent of their $87,000 job for the construction of storage and packaging buildings at the Benicia Arsenal.

* * *

Louis DeMatlia is superintendent for the Northwest Construction Co. on the Boeing Field grading and drainage work being done for the U. S. Army Engineers in Seattle, Wash.

* * *

Royce B. Mashburn is superintendent for W. C. Smith Co. for the construction of a swimming pool and other additional work at the Marine Base near El Centro, Calif.

* * *

L. Paul Fiorito is project manager for Western Construction Co. for the clearing, grading and paving of Arlington Airport runways, at Arlington, Wash. **Dan Fiorito** is general superintendent for Western.

* * *

Pat Obar is master mechanic for Ralph Atkinson Co. at their new shop just established on Santa Fe Ave. in Long Beach, Calif. **Rex Moss** is shop superintendent.

* * *

Charles V. Stone is working on the reconstruction of a bridge which recently failed near Lockford, Calif. F. Kaus, Stockton contractor, has been awarded the job.

* * *

Jack C. Noble is general superintendent for Case American Concrete Co. at their shops on Coronado Island.

* * *

Rufus Dickson is superintendent and **George Bronaugh** is foreman for Haddock Engineers, Ltd., for their housing project at Fallbrook, Calif.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK

Carboloy Tip Drill For Concrete Work

DRILLING THE THOUSANDS of conduit holes required in concrete ships ten times faster than was previously possible is a record made by Concrete Ship Constructors, National City, Calif. In accomplishing this, the company employed a new type of masonry drill tipped with Carboloy cemented carbide. Each concrete ship requires some 4,000 holes from 1 in. to 1½ in. deep for electrical installations alone. Whereas the conventional star drill used to produce holes in concrete ships — which were aged one to two months prior to the drilling — had to be continuously resharpened, the carbide tipped masonry drills averaged 300 holes per sharpening.

Whirley Crane Used to Hoist Rock Trucks From Ship Basin

EXCAVATION UNDER WAY for deepening of two graving docks at Richmond Shipyard No. 3, of the Kaiser Co., Inc., Richmond, Calif., so that the docks will be able to accommodate Navy vessels in need of repair, is carried out by several unique means.

The existing graving dock floor was at elevation -18, which was an adequate depth of water over the keel blocks for launching the 18,500-ton vessels being constructed at the yard, when they had no cargo or ballast. With the new depth of -30, it will be possible to bring the same type of vessel or others still larger into the dock for repairs, even when loaded.

A cellular steel sheet pile cofferdam was built at the outer end of the graving dock to hold back the water of San Francisco Bay during excavation and construction activities. What little seepage occurred was easily pumped out, keeping the work dry at all times.

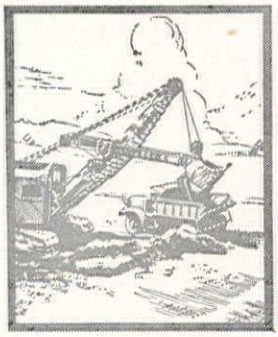
The excavation was mostly in soft mud, since a ledge of hard rock was found to exist at elev. -32. A bulldozer and a shovel were used in excavating, the latter loading the material in trucks. Inasmuch as the basin being deepened lies between two existing shipbuilding ways (in which shipbuilding is simultaneously going forward), Whirley cranes are available to assist in the work. Therefore a suitable platform was built, upon which the loaded trucks could be lifted bodily out of the basin, and practically all the excavation was handled in this manner. The cranes were also used for depositing concrete in buckets. The rock which was removed from the basin is used in construction of quay walls nearby. An article on this project appears elsewhere in this issue.

Measure the VALUE of "Hercules" (Red Strand) Wire Rope by what it will do

REG. U.S. PAT. OFF.

For the sake of both speed and economy, it is important to use materials and equipment of proven dependability.

For fifty-nine years "HERCULES" (Red-Strand) Wire Rope has been demonstrating its stamina and trustworthiness. Its record of consistent performance—day after day, and month after month—has made and held a host of loyal friends. Such performance is never a matter of chance, but the result of sound fundamental principles, experienced organization, and advanced manufacturing facilities.



Why not measure the ultimate value of "HERCULES" (Red-Strand) Wire Rope by the accurate yardstick of performance? You will quickly discover that its long life makes for more continuous production and lower operating cost, saving both time and money.

"HERCULES" (Red-Strand) Wire Rope is furnished in both Round Strand and Flattened Strand constructions—in either the Preformed or Non-Preformed types. In this one grade is a right rope for every heavy duty purpose.

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

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CHICAGO . . . 810 W. Washington Blvd.
DENVER . . . 1554 Wazee Street

SAN FRANCISCO . . . 520 Fourth Street
PORTLAND . . . 914 N. W. 14th Avenue
SEATTLE . . . 3410 First Avenue South

UNIT BID SUMMARY

Irrigation . . .

New Mexico—Quay County—Bureau of Reclamation—Structures

Lym Engineering Co., Salt Lake City, Utah, submitted the lower bid of $130,041 to the U. S. Bureau o Reclamation, Tucumcari, for the construction of structures for Bell, Elliott, Roberts, State, Jack County Liberty, Young, Coulter, Hurley, and Bend laterals and sublaterals on the Tucumcari Project. The follow ing unit bids were submitted:

(1) Lym Engineering Co. $130,041
(2) Robert E. Ziebarth $159,16

		(1)	(2)
4,800	cu. yd. excav. for struct.	1.20	1.6
11,400	cu. yd. backfill	.35	.9
6,000	cu. yd. compact. backfill	1.80	.8
2,150	cu. yd. conc. in struct.	40.00	47.0
205,000	lb. place reinf. bars	.036	.06
2,580	sq. yd. dry-rock pave.	3.63	5.4
5	M.F.B.M. erect timber in struct.	96.80	115.0
3,240	lin. ft. lay 15-in. diam. conc. pipe	.97	.5
36	lin. ft. lay 18-in. diam. conc. pipe	1.06	1.8
36	lin. ft. lay 21-in. diam. conc. pipe	1.21	2.1
596	lin. ft. lay 24-in. diam. conc. pipe	1.35	2.3
72	lin. ft. lay 30-in. diam. conc. pipe	1.45	8.0
108	lin. ft. lay 36-in. diam. conc. pipe	1.93	8.5
48,000	lb. install gates and misc. metalwork	.04	.04

Idaho—Kootenai County—Bureau of Reclamation—Structures

Northwestern Engineering Co., of Rapid City, So. Dakota, submitted the low bid to the Bureau of Recla mation, Boise, Idaho, for the combined total of two schedules at $111,395. Bids were opened March 30th for the construction of an irrigation canal and accessory control gates, pipes and lining. Summary of the uni bids submitted is as follows:

(1) Northwestern Engineering Co. $111,395
(2) Sather & Sons 147,738
(3) Charles A. Power 153,865
(4) Roy L. Bair $166,153
(5) Henry I. Horn 190,292
(6) W. C. Smith Co. 203,318

SCHEDULE 1

		(1)	(2)	(3)	(4)	(5)	(6)
35,000	cu. yd. excav., common, for canal	.20	.28	.42	.22	.40	.40
100	cu. yd. excav., rock, for canal	2.20	1.60	2.50	.22	2.00	6.00
2,000	sta. cu. yd. overhaul	.05	.03	.03	.05	.05	.05
10,000	cu. yd. compacting embankments	.15	.30	.35	.22	.30	.50
5,600	cu. yd. compacted earth lining of canal	1.20	2.00	2.00	2.40	6.00	3.00
5,400	cu. yd. gravel blanket in canal	.75	1.35	1.30	1.50	2.00	2.50
8,000	cu. yd. excav., common, for pipe trench on lateral 6.7 - 2.4	.40	.60	.40	.22	.50	.65
100	cu. yd. excav., rock, for pipe trench on lateral 6.7 - 2.4	4.00	2.00	2.50	.22	2.00	7.00
8,000	cu. yd. backfill of pipe trench on lateral 6.7 - 2.4	.52	.30	.20	2.25	.50	.85
3,000	sq. yd. trimming earth foundations for conc. lining	.60	1.00	.20	.60	.75	.27
600	cu. yd. excavation, common, for structures	1.20	2.00	1.50	1.50	1.50	1.50
10	cu. yd. excavation, rock, for structures	4.00	5.00	3.00	1.50	4.00	10.00
400	cu. yd. backfill	.90	.40	.40	.60	.40	.85
300	cu. yd. compacting backfill	1.10	.75	1.00	1.50	.40	.75
130	cu. yd. concrete in structures	45.00	50.00	45.00	60.00	45.00	40.00
315	cu. yd. concrete in canal lining	22.50	30.00	27.00	37.00	40.00	50.00
28,000	lbs. placing reinforcement bars	.045	.04	.05	.07	.05	.04
100	sq. yd. dry-rock paving	3.00	4.00	3.00	4.50	3.00	3.00
2	M.F.B.M. erecting timber in structures	100.00	50.00	60.00	175.00	60.00	65.00
815	lin. ft. removing and salvaging exist. 24-in. diam. wood-stave pipe	.54	.50	.40	.75	.35	1.50
500	lin. ft. erecting 24-in. diam. wood-stave pipe	1.00	1.75	1.50	2.25	1.50	2.00
100	ends cutting and slotting ends of staves	.20	.25	.30	1.50	.15	.25
50	pedestals, placing pedestals for 24-in. diam. wood-stave pipe	1.00	3.00	4.00	4.50	3.00	3.00
10	lin. ft. laying 4-in. diam. conc. pipe	.37	.30	.30	.75	.30	.50
60	lin. ft. laying 6-in. diam. conc. pipe	.45	.40	.40	.75	.30	.50
10	lin. ft. laying 8-in. diam. conc. pipe	.60	.60	.50	.75	.40	.50
10	lin. ft. laying 10-in. diam. conc. pipe	.75	.75	.65	.75	.40	.50
20	lin. ft. laying 12-in. diam. conc. pipe	.75	.90	.80	.75	.50	.50
210	lin. ft. laying 15-in. diam. conc. pipe	.75	1.10	1.00	.90	.60	.75
5,100	lin. ft. laying 18-in. diam. conc. pipe	.90	1.20	1.00	.45	.75	.90
2,200	lin. ft. laying 21-in. diam. conc. pipe	1.00	1.40	1.20	.50	.90	1.05
2,050	lin. ft. laying 24-in. diam. conc. pipe	1.10	1.60	1.40	.60	1.05	1.25
5,000	lin. ft. laying 27-in. diam. conc. pipe	1.50	1.75	1.45	.90	1.20	1.50
16	lin. ft. laying 30-in. diam. conc. pipe	3.00	1.90	2.00	2.25	2.00	2.00
1,000	lbs. installing gates and misc. metalwork	.12	.15	.10	.60	.10	.12

SCHEDULE 2

70,000	cu. yd. excavation, common, for canal	.19	.28	.40	.22	.45	.45
100	cu. yd. excavation, rock, for canal	2.00	1.60	3.00	.22	2.00	6.00
16,000	sta. cu. yd. overhaul	.05	.03	.03	.03	.05	.05
35,000	cu. yd. compacting embankments	.15	.30	.35	.22	.30	.55
1,300	cu. yd. compacted earth lining of canal	1.20	2.50	2.00	3.75	6.00	3.60
1,100	cu. yd. gravel blanket in canal	.75	1.50	1.50	3.00	2.00	2.75
2,500	cu. yd. excavation, common, for structures	1.20	1.00	1.50	2.25	1.50	1.50
10	cu. yd. excavation, rock, for structures	4.00	3.00	3.00	2.25	4.00	10.00
1,200	cu. yd. backfill	.90	.40	.40	.75	.40	.85
1,000	cu. yd. compacting backfill	1.10	.75	1.00	2.25	.40	.75
190	cu. yd. concrete in structures	45.00	48.00	45.00	60.00	55.00	45.00
15,000	pounds placing reinf. bars	.045	.04	.05	.07	.06	.04
300	sq. yd. dry-rock paving	3.00	4.00	3.00	4.50	3.00	3.00
7	M.F.B.M erecting timber in structs.	100.00	50.00	60.00	200.00	60.00	65.00
4,500	lin. ft. erecting 42-in. diam. wood-stave pipe	1.30	1.75	1.50	2.10	1.50	3.00
500	ends, cutting and slotting ends of staves	.20	.50	.30	1.50	.15	.25
455	pedestals, placing pedestals for 42-in. diam. wood-stave pipe	2.50	3.00	4.00	2.50	3.00	7.00
12	lin. ft. laying 10-in. diam. conc. pipe	.75	.75	.75	1.50	.40	.50
455	lin. ft. laying 15-in. diam. conc. pipe	.80	1.10	1.00	1.50	.60	.85
216	lin. ft. laying 18-in. diam. conc. pipe	1.00	1.20	1.10	1.50	.75	1.10
102	lin. ft. laying 24-in. diam. conc. pipe	1.10	1.60	1.50	1.50	1.15	1.35
80	lin. ft. laying 27-in. diam. conc. pipe	1.20	1.75	1.70	2.25	1.30	1.75
156	lin. ft. laying 30-in. diam. conc. pipe	3.00	1.90	2.00	2.25	2.00	2.25
40	lin. ft. laying 42-in. diam. conc. pipe	4.00	2.50	2.50	3.00	3.00	3.00
10,000	pounds installing gates and miscel. metalwork	.12	.15	.10	.60	.10	.12
Lump sum, furn., constr., and remov. temporary constr. at railroad crossings		400.00	250.00	$2,000	$2,000	500.00	500.00

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*Coast Equipment Company, San Francisco 1
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*Columbia Equipment Co., Spokane, Wash.
Bunting Tractor Co., LaGrande, Ore., Boise and Twin Falls, Ida.
State Tractor & Equipment Co., Phoeniz, Ariz.
Connelly Machinery Company, Billings and Great Falls, Mont.
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Sewerage . . .

California—Ventura County—Federal Works Agency—Sewer

R. A. Wattson Co., North Hollywood, bid low at $118,271 on Unit 1 and Stroud-Seabrook, Bakersfield, bi low at $85,670 on Unit 2 to the Federal Works Agency, Los Angeles, for the construction of a sewer collectin system and treatment plant to service war housing units occupied by Pacific Naval Air Base employees a Port Hueneme. Unit bids were:

UNIT 1

(A)	R. A. Wattson Co.	$118,271
(B)	Bebek & Brkich	125,968
(C)	Martin Constr. Co.	133,811
(D)	Burch & Bebek	136,658
(E)	B. D. Zaich & Son	136,716
(F)	Artukovich Bros.	139,809
(G)	V C K Constr. Co.	142,717
(H)	Underground Constr. Co.	147,364
(I)	Bob Bosnyak	148,800
(J)	Stroud-Seabrook	151,923

UNIT 2

Stroud-Seabrook	$ 85,67
Contracting Engineers Co.	93,90
Wonderly Constr. Co.	95,72
Hoagland-Findlay Engineering Co.	97,68
Arthur Pinner, Jr.	98,80
Underground Constr. Co.	103,40
Bebek & Brkich	109,70
James B. Donaldson Constr. Co.	112,00
Burch & Bebek	117,05
J. W. Huntley	120,00

UNIT 1

(1) field office.
(2) 1,780 lin. ft. 18-in. vit. clay pipe main line sewer.
(3) 1550 lin. ft. 15-in.
(4) 8,500 lin. ft. 12-in.
(5) 4,460 lin. ft. 10-in.
(6) 8,550 lin. ft. 8-in.
(7) 40 18-in. x 4-in. Y's.
(8) 40 15-in. x 4-in. Y's.
(9) 212 12-in. x 4-in. Y's.
(10) 112 10-in. x 4-in. Y's.
(11) 180 8-in. x 4-in. Y's.
(12) 48 manholes.
(13) 20 cleanouts.
(14) 700 tons bedding rock.
(15) 1 only Lift Station No. 1.
(16) 2 only Lift Stations Nos. 2 and 3.
(17) 1 only Lift Station No. 4.

UNIT 2

Treatment plant, consisting of sewage treatmen works, plumbing plant, pressure pipe line, outfa pipe line and roadway.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	200.00	500.00	450.00	400.00	400.00	$1,000	$1,000	700.00	500.00	500.0
(2)	4.90	4.00	6.00	6.00	6.00	5.00	7.67	5.40	8.00	5.5
(3)	4.50	3.90	5.00	5.00	5.50	4.50	6.71	5.10	6.00	5.1
(4)	3.60	3.80	4.50	4.00	4.80	4.00	5.22	4.70	5.00	5.0
(5)	3.10	3.00	3.80	3.50	4.50	3.75	5.02	4.40	3.50	4.4
(6)	3.00	2.50	2.90	3.00	2.60	3.30	3.00	4.10	3.40	3.3
(7)	9.00	10.00	5.00	10.00	10.00	6.00	18.00	15.00	20.00	17.5
(8)	6.00	7.00	4.00	8.00	8.50	4.00	16.00	12.00	15.00	15.5
(9)	3.50	5.00	3.50	5.00	5.50	2.50	8.00	7.00	12.50	14.0
(10)	3.00	4.00	3.00	4.00	5.00	2.00	7.50	6.50	10.00	12.0
(11)	2.00	3.00	2.00	3.00	3.00	1.50	7.00	5.00	7.50	8.5
(12)	170.00	250.00	180.00	250.00	150.00	165.00	150.00	125.00	170.00	200.0
(13)	25.00	30.00	10.00	15.00	40.00	50.00	40.00	40.00	40.00	40.0
(14)	5.00	5.00	5.00	5.00	6.00	3.50	3.00	3.00	3.00	6.0
(15)	$5,600	$8,154	$6,500	$6,000	$6,000	$9,000	$2,500	$6,040	$5,000	$6,50
(16)	$6,600	$4,996	$3,950	$6,000	$8,000	$6,500	$4,000	$4,000	$10,000	$4,00
(17)	$5,900	$8,274	$6,400	$6,000	$6,000	$9,200	$2,500	$7,186	$5,000	$6,70

California—Los Angeles County—County—Storm Drain

Vido Kovacevich, South Gate, submitted the low bid to the Los Angeles County Supervisors, Los Angeles, at $100,881.20. The work is for the construction of Walnut Terrace lateral, and Leota St. stub of the East Compton Creek No. 1 Drainage System and appurtenant sanitary sewers in Walnut Park. Alfred Jones, county engineer, prepared the sewer plans. Specification and bids submitted are as follows:

(A)	Vido Kovacevich	$100,881
(B)	Pan-American Engineering & Construction Co.	108,175
(C)	Edward Green	112,906
(D)	Oberg Bros.	114,327
(E)	Chas. H. Johnston	114,989
(F)	Burch & Bebek	$115,449
(G)	L. S. Chism & Co.	117,374
(H)	Norman I. Fadel	123,136
(I)	Martin Constr. Co.	127,205
(J)	Dimmitt & Taylor	134,390
(K)	M. F. Kemper Constr. Co.	138,640

(1) Excav. (excepting excav. for pipe lines, manholes, pipe junction structures, catch basins, head walls, retaining walls, wing walls, aprons, cut-off walls and tile sub-drain of all descriptions) including all clearing, grubbing, dewatering and timbering, and removal of all existing structures, also all backfilling, leveling and rolling required to restore the level of the ground surface to its original grade, also the disposal of all excess excavated material not required for backfilling and including all material and work incidental thereto.
  (a) approx. 9,400 cu. yds. excavation for rectangular conduit section.
(2) Cement concrete in place.
  (a) Approx. 290 cu. yd. Class A-1 concrete.
  (b) Approx. 1,514 cu. yd. Class A concrete.
(3) Reinforcing steel in place.
  (a) Approx. 205,200 lb. reinf. steel in place.
(4) Catch basins with aprons complete in place, including all cement, concrete, premix, all reinforcing steel, steps, iron cover or grating and frame, all excavation, backfill and disposal of excess excavated material, modeling or remodeling adjacent street surfaces, and including all material and work incidental thereto.
  (a) 8 standard catch basins No. 1, with conc. apron 1-A.
  (b) 3 standard catch basins No. 1, with premix apron 1-A.
  (c) 5 standard catch basins No. 2, with premix apron 1-A.
  (d) 1 standard catch basin No. 10, with conc. apron 1-A.
(5) Manholes complete in place.
  (a) 2 standard manholes No. 1 complete.
  (b) 1 standard manhole No. 2 complete.
(6) Standard junction structures complete in place.
  (a) 2 standard junction structs. No. 2 compl.
(7) Reinforced cement concrete pipe centrifugally spun complete in place.
  (a) Approx. 173 ft. of 27-in. 1400 D Stand.
  (b) Approx. 100 ft. of 33-in. 1600 D Stand. reinf. cem. conc. pipe centrifugally spun.
(8) Plain cement concrete pipe in place.
  (a) Approx. 153 ft. of 12-in. cem. conc. pipe in place.
  (b) Approx. 222 ft. of 15-in. cem. conc. pipe in place.
  (c) Approx. 237 ft. of 18-in. cem. conc. pipe in place.
  (d) Approx. 21 ft. of 21-in. conc. pipe in pl.
(9) Restoring street surfacing.
  (a) Approx. 33 sq. yd. of 4-in. premix pavement and wearing surface.
  (b) Approx. 204 sq. yd. of 3-in. premix pavement and wearing surface.
  (c) Approx. 1,491 sq. yd. of 2-in. premix pavement and wearing surface.
(10) 1,270 lin. ft. 12-in. extra strength vitrified clay pipe main line sewer.
(11) 670 lin. ft. 10-in. extra strength vitrified clay pipe main line sewer.
(12) 40 lin. ft. 10-in. Class B cast iron pipe or class 150, centrifugally cast, cast iron pipe, main line sewer with standard encasement.
(13) 44 lin. ft. 8-in. same.
(14) 220 lin. ft. 6-in. extra strength vitrified clay pipe house connection sewers.
(15) 125 vertical ft. 6-in. standard strength vitrified clay pipe chimney sewer.
(16) 11 brick sewer structures.

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
(1)	(a)	1.70	3.00	3.50	3.00	3.90	3.00	3.15	4.00	3.20	4.50	4.10
(2)	(a)	14.90	15.00	14.00	20.00	20.00	18.00	17.50	18.00	24.39	20.00	21.50
	(b)	28.60	26.50	26.00	30.00	24.85	29.00	35.00	29.50	23.39	30.00	33.50
(3)	(a)	.055	.055	.06	.55	.06	.06	.05	.06	.06	.06	.08
(4)	(a)	148.00	175.00	188.00	150.00	145.00	175.00	160.00	150.00	200.00	175.00	160.00
	(b)	148.00	170.00	188.00	150.00	140.00	165.00	160.00	150.00	200.00	175.00	160.00
	(c)	210.00	290.00	280.00	200.00	275.00	275.00	235.00	300.00	400.00	300.00	275.00
	(d)	270.00	375.00	360.00	250.00	366.50	450.00	350.00	450.00	600.00	425.00	375.00

(Continued on next page)

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"...we have the distinction of being the first Ring-Free users in Buffalo. Our first trial was in two Ford trucks seven years ago.

...our fleet has increased to fourteen trucks including Autocars, Internationals, Fords and one Chevrolet.

...trucks are all used in hauling sand and gravel...the hardest kind of work on trucks as roads are bad...loads are heavy. Due to conditions there is a constant uneven strain on motor bearings.

...if Ring-Free did not have a tough film strength that protected these bearings my motors would not be able to show 80,000 miles without major repairs as many of them have.

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Excerpts from letter of—

George Muehlbauer

George Muehlbauer
205 Courtland Avenue
Buffalo, New York

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(5)	(a)	100.00	105.00	105.00	100.00	75.00	125.00	100.00	100.00	400.00	110.00	110.00
	(b)	125.00	125.00	105.00	200.00	150.00	150.00	150.00	200.00	400.00	110.00	110.00
(6)	(a)	80.00	75.00	300.00	100.00	125.00	250.00	100.00	500.00	750.00	125.00	250.00
(7)	(a)	8.15	7.00	8.00	8.00	8.15	8.00	7.50	6.75	10.00	13.50	9.00
	(b)	12.00	9.00	10.00	11.00	12.77	8.50	10.00	7.75	11.00	15.00	9.50
(8)	(a)	4.55	3.00	5.00	4.00	2.60	5.00	3.80	3.75	8.00	6.00	4.50
	(b)	6.10	3.90	5.00	5.00	3.12	5.50	3.60	4.75	8.50	7.00	6.10
	(c)	8.00	4.50	6.00	6.00	4.00	7.00	5.00	5.75	9.00	8.00	7.00
	(d)	8.35	5.00	10.00	7.00	4.20	7.50	8.00	5.75	9.40	10.00	7.50
(9)	(a)	2.60	1.80	1.50	2.00	3.00	2.00	1.00	2.00	2.70	1.40	2.20
	(b)	2.35	1.35	1.00	1.80	2.25	1.75	.75	1.50	2.25	1.15	2.00
	(c)	1.30	.90	.80	1.50	1.50	1.50	.50	1.00	1.98	1.00	1.50
(10)		4.70	5.00	4.00	4.00	3.50	4.50	3.50	3.75	9.00	4.75	4.50
(11)		4.70	4.00	4.00	4.00	3.25	4.25	3.00	3.50	8.50	4.50	4.25
(12)		6.50	4.00	6.00	4.00	9.00	7.00	4.75	4.00	10.00	5.00	6.00
(13)		5.85	3.10	5.00	4.00	8.00	6.00	4.75	4.00	9.00	5.00	5.50
(14)		3.70	2.50	3.50	4.00	4.00	4.00	2.50	2.75	3.00	5.00	5.00
(15)		5.85	6.50	8.00	4.00	5.60	7.75	2.50	5.00	5.00	5.00	5.50
(16)		195.00	275.00	200.00	200.00	200.00	140.00	175.00	250.00	350.00	250.00	225.00

California—Alameda County—District—V.C. Pipe

Manuel Smith, Oakland, submitted the low bid of $239,289 for the construction of a vitrified sewer in the Oro Loma Sanitary District. L. Cedric Macabee, consulting engineer, prepared the plans for the new system. The following is a summary of the unit bids:

(A) Manuel Smith $239,289
(B) V. C. K. Construction Co. 264,798
(C) J. Pestana 276,340
(D) J. L. Kruly 289,084
(E) Freethy-Fogelberg 314,175
(F) Steve Rados $328,731
(G) Burch & Bebek 359,260
(H) R. Gould & Son 363,058
(I) M. Miller Co. 385,750
(J) Stolte, Inc. 484,440

(1) 97,324 lin. ft. 6-in. vit. clay pipe sewer; cement mortar joints in place and pave. replacement.
(2) 47,188 lin. ft. 8-in. same.
(3) 3,416 lin. ft. 10-in. vit. clay pipe sewers in easement, cem. mortar joints and pave. replacem't.
(4) 237 lin. ft. 6-in. CI pipe sewer with lead joints in place under Western Pacific right of way, Foothill Blvd. and Castro Valley Blvd., by boring methods.
(5) 283 lin. ft. 8-in. CI pipe sewer, lead joints in place in Lewelling Blvd., Western Pacific right of way, and Maddox Rd., by boring methods.
(6) 372 each, brick manholes complete with Class A conc. base, CI frames and covers and galv. iron steps.
(7) 67 each, vitr. clay pipe risers in place with CI frames and covers and Class A conc. base.
(8) 1,950 each, 8x4-in. wye branches with clay cover.
(9) 950 each, 6x4-in. wye branches with clay cover.

ALTERNATE:
(10) 372 each, portland cem. precast conc. manholes in place.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	1.25	1.38	1.38	1.60	1.50	1.63	1.90	1.95	2.10	2.52
(2)	1.30	1.60	1.67	1.90	2.00	2.00	2.10	2.10	2.15	2.96
(3)	1.40	1.96	2.10	2.10	3.15	3.65	2.75	2.25	3.00	3.16
(4)	13.00	6.00	12.00	4.50	14.00	6.00	8.00	20.00	10.00	15.00
(5)	15.00	8.00	15.00	5.50	15.00	7.00	10.00	25.00	15.00	20.00
(6)	106.00	105.00	118.00	105.00	125.00	115.00	135.00	125.00	150.00	136.00
(7)	25.00	35.00	24.00	22.00	20.00	20.00	20.00	30.00	75.00	30.00
(8)	1.50	11.50	1.38	1.00	3.00	1.25	3.50	2.00	.91	2.37
(9)	1.25	.60	.90	1.00	2.00	1.25	3.00	2.50	.59	1.65
(10)	107.00	105.00	112.00	102.00	122.00	167.50	135.00	120.00	150.00	156.00

Bridge and Grade Separation . . .

Oregon—Jackson County—State—Trail Bridge

Norris & Philpott Co., of Portland, submitted the low bid at $18,532 to the Oregon State Highway Dept., Portland, for the construction of Trail Bridge No. 684 over the Rogue River on Crater Lake Highway. Bids for this reinforced concrete structure are as follows:

(1) Norris & Philpott $18,532
(2) Lindstrom Bros. 19,900
(3) Harry I. Hamilton 22,320
(4) Tru Mix Concrete Co. $24,736
(5) C. J. Montag & Sons 27,726

	(1)	(2)	(3)	(4)	(5)
Lump sum, preparation of exist. bridge and maint. of traffic	$2,000	$2,000	$3,000	$2,000	$6,500
12 cu. yd. structural excavation	6.00	5.00	10.00	8.00	10.00
180 cu. yd. Class "A" concrete	40.00	38.00	45.00	60.00	47.50
20,000 lbs. metal reinforcement	.078	.09	.08	.12	.09
11,200 lbs. structural steel	.20	.20	.20	.20	.13
640 lin. ft. metal handrail	6.50	9.00	9.00	7.50	7.50
Lump sum, cleaning and painting struc. steel	$1,300	$1,200	$1,500	$2,400	$4,500

Washington—Whatcom County—State—Concrete Bridge

Axel Osberg, Seattle, Wash., submitted the low bid to and was awarded the contract at $67,613 by the Director of Highways, Olympia, Wash., for the construction of a reinforced concrete bridge on the Austin Pass Branch of the Glacier to Mt. Baker State Highway. Bids are listed as follows:

(A) Axel Osberg $67,613
(B) Scheumann & Johnson 69,748
(C) M. P. Butler 71,299
(D) M. P. Munter Co. 71,890
(E) L. Romano Engineering Co. 74,019
(F) A. W. Stevens Construction Co. $76,071
(G) C. V. Wilder Co. 78,360
(H) David Nygren 83,708
(I) Gaasland Construction Co. 89,984
(J) MacRae Bros. 107,132

(1) Lump sum, clearing and grubbing.
(2) 380 cu. yd. uncl. excav. incl. haul.
(3) 1,390 cu. yd. common excav. incl. haul.
(4) 520 cu. yd. solid rock excav. incl. haul.
(5) 8.6 stas. (100 ft.) finishing roadway.
(6) 520 cu. yd. sel. roadway borrow (incl. haul).
(7) 250 cu. yd. cr. st. surf. top crse. in pl. on rdwy. from stockpiles.
(8) 20 cu. yd. loose riprap, Class A, in place.
(9) Lump sum, const. and remov. detours (5).
(10) 1,094 cu. yd. structure excavation.
(11) 445 cu. yd. concrete, Class A, in place.
(12) 378 cu. yd. concrete, Class B, in place.
(13) 138,000 lb. steel reinf. bars in place.
(14) 5,000 cu. yd. structural steel in place.
(15) 658 lin. ft. reinf. conc. br. railing in place.
(16) 3 each bridge drains complete in place.
(17) Lump sum, remov. existing structs. (6).

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	$1,500	800.00	$2,000	$1,680	$2,000	$1,000	$3,000	$1,200	$3,600	550.00
(2)	1.75	2.00	1.50	1.00	1.00	2.50	2.50	1.00	5.00	5.00
(3)	1.00	2.00	1.00	.73	1.00	1.50	1.25	.50	1.70	3.00
(4)	4.00	2.00	2.50	1.68	2.00	5.00	5.00	3.00	4.25	7.00
(5)	20.00	50.00	20.00	20.00	10.00	15.00	20.00	20.00	36.00	50.00
(6)	2.50	4.00	3.00	2.00	2.00	4.00	3.00	3.00	2.75	3.80
(7)	3.50	5.00	2.50	3.60	2.50	4.25	3.50	4.00	3.00	6.00
(8)	5.00	5.00	4.00	4.00	5.00	5.00	10.00	5.00	25.00	15.00
(9)	$5,000	$1,000	$6,000	$1,540	$3,000	$1,250	$5,500	$5,000	$7,000	$3,800

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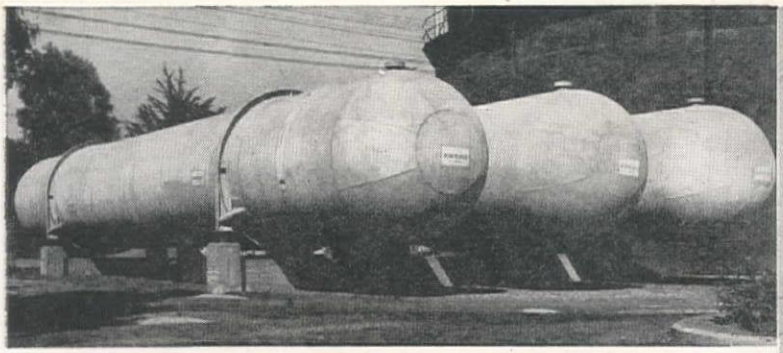
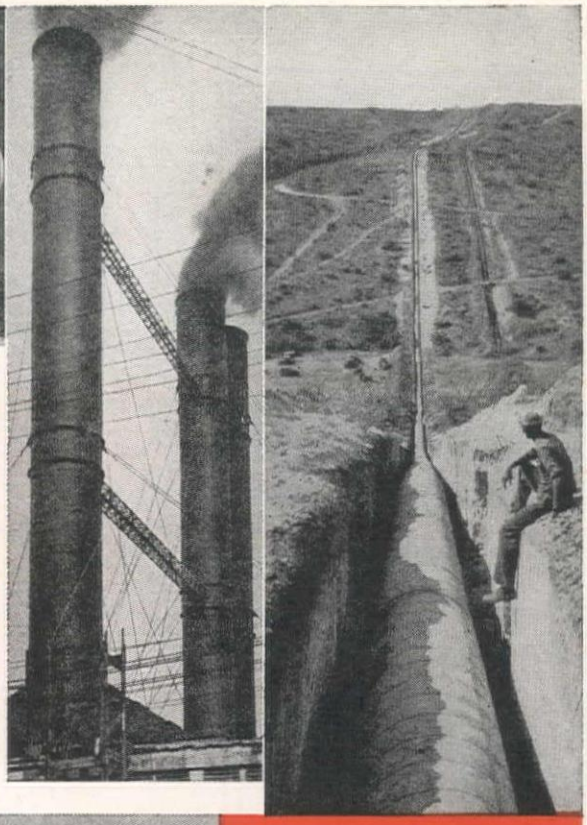
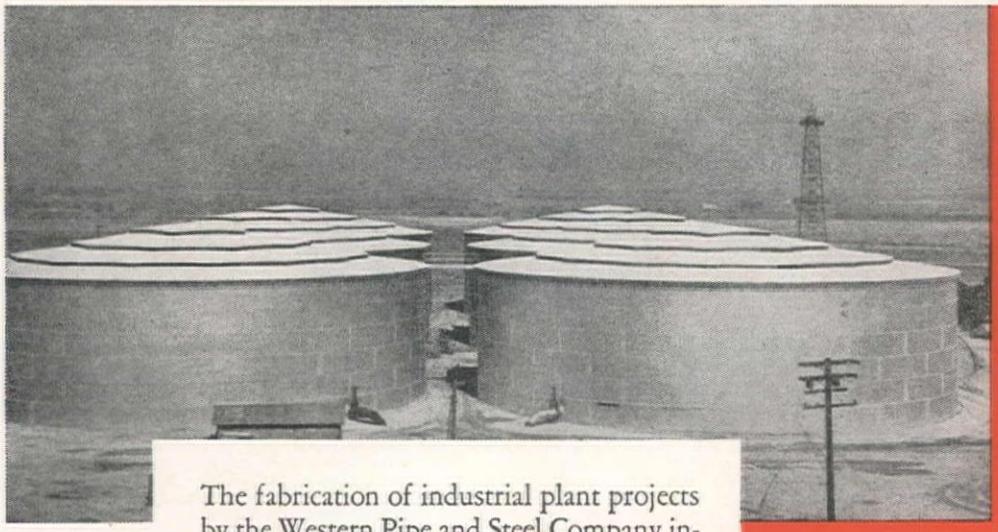




FROM SMOKESTACKS AND BOILERS TO COMPLETE PLANTS



WESTERN BUILT PRODUCTS INCLUDE:

- Absorbers
- Accumulators
- Agitators
- Boilers
- Buildings, Sectional Steel
- Casings, Oil and Water
- Condensers
- Coolers
- Culverts
- Gas Cleaners
- Gas Holders
- Gas Separators
- Heat Exchangers
- Joints, Expansion
- Linings, Corrosion Resisting
- Penstocks, Steel
- Refinery Equipment
- Stainless Steel
- Tunnel Linings
- Tanks, Bolted, Galvanized, Riveted, Welded
- Towers, Bubble, Evaporator, Fractionating
- Vessels, Pressure
- Walkways, Structural

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Fabricators and Erectors

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Box 2015, Terminal Annex
Los Angeles 54, California

200 Bush Street
San Francisco 6
California

PLANTS AND OFFICES: FRESNO, BAKERSFIELD, TAFT, CALIFORNIA AND PHOENIX, ARIZONA

(10)	3.50	5.00	10.00	7.50	6.50	10.00	3.50	10.00	10.00	18.00
(11)	45.00	45.00	38.70	49.00	50.00	46.00	50.00	55.00	49.00	56.00
(12)	40.00	45.00	38.70	49.00	50.00	42.00	50.00	55.00	47.00	56.00
(13)	.06	.07	.06	.06	.065	.07	.06	.06	.10	.08
(14)	.07	.30	.15	.40	.30	.40	.35	.20	.20	.40
(15)	6.50	6.00	4.00	6.00	6.50	6.00	7.00	7.00	5.00	7.00
(16)	50.00	40.00	50.00	50.00	50.00	40.00	50.00	50.00	40.00	80.00
(17)	$2,500	$1,775	$3,000	$1,300	$1,200	$1,800	$2,000	$1,800	$1,200	$5,200

California—Monterey County—State—Concrete Under-pass

The low bid for this proposal was considered irregular by the California Division of Highways, Sacramento, so that the second bid, submitted by Dan Caputo, San Jose, was considered low. His bid was $11,130, to construct a farm road under-crossing 24 mi. north of the San Luis Obispo County line on Route 56. Unit bids submitted are as follows:

(1) Earl W. Heple $10,940
(2) Dan Caputo 11,130
(3) L. A Brisco $13,028
(4) F. Fredenburg 14,170

	(1)	(2)	(3)	(4)
Lump sum, remove existing struct.	750.00	600.00	250.00	$1,620
600 cu. yd. structure excav.	3.00	4.00	5.42	4.00
138 cu. yd Class "A" P.C. conc.	45.00	45.00	51.20	50.00
22,000 lb. bar reinf. steel	.055	.05	.0473	.05
22,000 lb. place bar reinf. steel	.01	.01	.02	.02
Lump sum, miscel. items of work	750.00	600.00	980.00	$1,710

Utah—Summit County—State—Highway Bridge

Clifford Prince, Salt Lake City, submitted the low bid to and was awarded the contract by Utah State Road Commission at $6,067.34 for the construction of the Weber River structural steel bridge. Unit bids submitted are as follows:

(1) Clifford Prince $5,517
(2) Mendenhall & Whitney 5,951
(3) The Contracting Corp. 6,970
(4) Gibbons & Reed Co. 8,159
(5) Lym Engineering Co. $8,871
(6) Young & Smith 9,153
(7) Engineer's estimate 6,151

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
86 cu. yd. excav. for struct.	3.00	6.56	8.50	7.50	12.50	12.00	5.00
85 cu. yd. conc., Class "A"	30.00	37.50	45.00	50.00	52.50	42.00	28.00
19,692 lbs. struc. steel, (erection and painting)	.05	.03	.018	.05	.07	.05	.035
11,988 lbs. reinf. steel	.07	.08	.08	.09	.10	.10	.08
.670 M.F.B.M. Lumber (net)	200.00	200.00	300.00	150.00	2.50	400.00	200.00
1 ea. removal of existing struct.	500.00	230.00	350.00	600.00	254.26	600.00	500.00
1 ea. detour	250.00	286.00	550.00	500.00	500.50	$1,500	500.00

Airport...

California—San Bernardino County—U.S.E.D.—Paving and Taxiways

The Tanner Construction Co., Phoenix, Ariz., was awarded a $133,533 contract by the U. S. Engineer Office, Los Angeles, for the placing of paving and construction of taxiways at the Victorville Army Airfield, Victorville. Unit bids were:

	(1)	Alt.
(A) Tanner Constr. Co.	$133,533	$41,730
(B) Matich Bros.	138,595	33,600
(C) Geo. Herz & Co.	146,767	37,987
(D) R. R. Hensler	152,353	37,450
(E) R. W. Hampton	170,623	53,435
(F) Frontier Constr. Co.	$173,150	$41,673
(G) Guerin Bros.	175,536	46,325
(H) Jas. I. Barnes Constr. Co.	175,812	104,100
(I) Dimmitt & Taylor	177,259	46,945
(J) Griffith Co.	189,783	41,340
Government est.	149,288	39,534

(1) Lump sum, move bldgs.
(2) Lump sum, remove and replace pave. for drainage lines.
(3) 10,000 cu. yd. excav. and grade.
(4) 4500 squares scarify native earth.
(5) 22,000 squares roll subgrade and earth fill with smooth roller.
(6) 44,000 squares roll subgrade and earth fill with sheepsfoot roller.
(7) 1800 squares load test subgrade.
(8) 100 cu. yd. hand tamp.
(9) 2900 cu. yd. grav. for base crse.
(10) 6500 squares roll grav. base crse. with sheepsfoot roller.
(10a) 3250 squares roll grav. base crse. with smooth roller.
(11) 6500 squares load test. gravel base crse.
(12) 1400 cu. yd. compact cem.-treated gravel base crse.
(13) 4300 bbl. port. cem.
(14) 380 gal. membrane curing.
(15) 2000 cu. yd. 12-8-12-in. port. cem. conc. airfield pave.
(16) 1550 dowels, ¾ x 16-in.
(17) 550 tie bars, ⅝ x 30-in.
(18) 130 tons liq. asph., grade MC-1.
(19) 60 tons liq. asph., grade RC-3.
(20) 410 tons 85-100 pene. paving asph.
(21) 1700 tons level. crse. asph. conc.
(22) 1000 tons wear. crse. asph. conc.
(23) 4950 tons hot-mixed surfac.
(24) 25,000 sq. yd. compacted 2-in. native earth surfacing.
(25) 25 cu. yd. stockpiled native earth mixt.
(26) 168 tons liq. asph., grade MC-3, for field-mixed native earth.
(27) 75 tons emuls. asph. for seal coat.
(28) 675 tons cover aggreg. for seal coat.
(29) Lump sum, elect. work.
(30) Lump sum, alter. to runway lighting.
(31) 110 cu. yd. native earth filler crse.
(32) 400 lin. ft. 3-in. cast iron water pipe.
(33) 200 lin. ft. 2-in. cast iron water pipe.
(34) 200 lin. ft. 1¼-in. steel water pipe.
(35) 1 3-in. gate valve.
(36) 2 2-in. gate valves.
(37) 2 2-in. curb stops and serv. boxes.
(38) 2 1¼-in. curb stops and serv. boxes.
(39) Lump sum, sterilize water lines.
(40) 530 lin. ft. vitr. clay pipe sewer.
(41) 2 surf. cleanout boxes, type A.
(42) 4 surf. cleanout boxes, type B.
(43) 2 Y-branch fittings installed in exist. sewers.
(44) 10 cu. yd. conc. for structs.
(45) 6 frames and covers for drainage structs.
(46) Lump sum, alter. to exist. catch basin.
(47) 1100 cu. yd. drainage ditch excav.
(48) 1300 cu. yd. grade ditches.
(49) 730 lin. ft. 15-in. 14-gage CMP drain.
(50) 260 lin. ft. 15-in. 16-gage CMP drain.
(51) 200 lin. ft. 18-in. 12-gage CMP drain.
(52) 1040 lin. ft. 18-in. 14-gage CMP drain.
(53) 225 lin. ft. 6-in. cast iron drain pipes.
(54) 385 lin. ft. 8-in. cast iron drain pipes.
(55) 3 surf. cleanout boxes for drains.
(56) 10 cu. yd. rock apron.
(57) 2100 sq. yd. paint. runway markings.
(58) 12. sta. paint. 6-in. reflective white stripe.
(59) 75. sta. paint. 6-in. reflective yellow taxiway stripes.
(60) 107. install. delineators.

Alternates for Items 3, 9, 10, 11, 12, 13

(61) 14,000 cu. yd. excav. and grade.
(62) 5800 bbl. port. cem.
(63) 7700 sq. yd. 6-in. soil-cement base crse.
(64) 12,100 sq. yd. 8-in. soil-cement base crse.
(65) 300 cu. yd. field-mixed native earth filler crse.
(66) 190 tons. liq. asph., grade MC-3, for field-mixed native earth.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	$8,000	$7,600	$8,300	$10,000	$7,500	$5,000	$9,000	$7,660	$5,000	$9,200
(2)	300.00	800.00	$1,050	$1,000	$2,300	500.00	500.00	$1,000	$1,000	$1,400
(3)	.75	.60	.87	.80	1.15	1.15	.90	.75	1.00	.71
(4)	.10	.05	.10	.03	.06	.20	.15	.10	1.00	.14
(5)	.02	.035	.034	.08	.06	.05	.05	.04	.05	.05
(6)	.04	.03	.025	.05	.10	.10	.06	.04	.05	.10
(7)	.20	.20	1.00	.44	.22	.62	.15	.15	.50	.40

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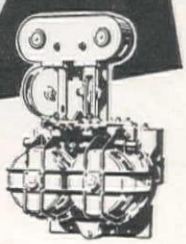
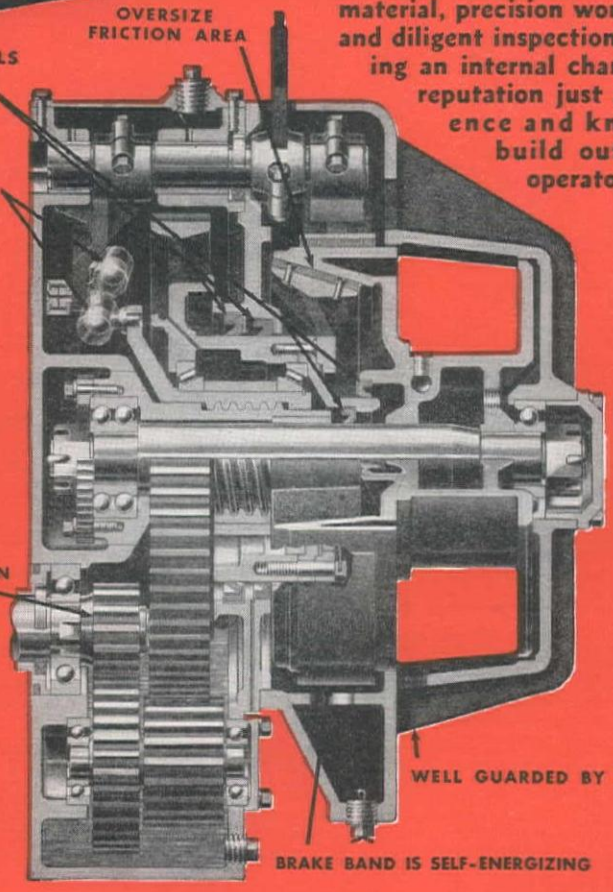
IT'S WHAT'S INSIDE ... that makes the man

Isaacson KABLE POWER UNIT ... is like that, too!



Modern basic design, plus tested material, precision workmanship and diligent inspection, is building an internal character and reputation just as experience and knowledge build outstanding operators.

The same internal character is built into either the single or double drum units—both are available for your tractor.



Isaacson Kable Power Unit is the secret of profitable, trouble-free cable operation. See your tractor dealer or write for further information.

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Tractor Equipment

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(8)	4.00	2.00	3.00	5.00	1.35	1.35	5.00	4.00	5.00	2.00
(9)	2.35	3.00	3.28	1.90	2.85	4.06	3.80	4.25	4.75	4.00
(10)	.04	.03	.025	.05	.12	.10	.06	.04	.05	.10
(10a)	.03	.035	.034	.08	.09	.05	.05	.04	.05	.05
(11)	.20	.20	.25	.44	.15	.62	.15	.15	.50	.40
(12)	3.60	4.25	4.15	4.50	4.65	9.22	5.50	2.50	6.00	8.70
(13)	2.50	2.40	2.30	2.20	2.55	2.50	2.25	2.35	3.00	2.40
(14)	1.20	1.50	1.05	.80	1.25	1.00	1.00	1.00	1.50	1.60
(15)	9.00	9.80	12.85	11.00	14.50	10.50	16.00	10.00	15.00	15.00
(16)	.40	.20	.24	.25	.35	.20	.26	.21	.75	.60
(17)	.30	.20	.19	.60	.55	.18	.26	.32	.75	.50
(18)	18.00	20.00	19.90	16.00	17.50	19.70	18.00	16.50	25.00	26.00
(19)	19.00	20.00	49.50	16.00	23.00	19.70	19.00	16.50	30.00	24.00
(20)	15.00	14.00	14.00	14.00	16.50	16.50	15.00	16.00	16.50	18.00
(21)	3.25	4.25	3.70	5.00	4.35	6.00	5.00	6.50	4.24	5.85
(22)	3.25	4.23	3.70	5.00	4.50	6.00	5.15	6.70	4.35	5.85
(23)	2.75	3.90	3.50	4.75	4.25	4.85	5.00	6.50	4.00	5.45
(24)	.08	.07	.10	.08	.21	.09	.25	.45	.10	.15
(25)	2.00	5.00	1.40	1.00	3.75	3.00	4.00	6.00	2.00	2.50
(26)	16.00	15.00	14.90	16.00	18.50	17.00	20.00	16.00	17.00	19.00
(27)	25.00	30.00	22.15	20.00	27.50	21.00	25.00	23.00	25.00	28.00
(28)	5.00	4.50	3.30	3.00	5.50	4.30	5.00	3.00	5.00	5.00
(29)	$1,320	$1,190	$1,390	$1,200	$2,500	$1,200	$1,200	$1,368	$1,150	$2,200
(30)	$5,800	$5,200	$3,230	$5,200	$7,200	$5,374	$5,100	$5,878	$5,000	$3,700
(31)	2.00	5.00	2.40	1.10	3.65	1.00	4.00	6.00	2.00	2.60
(32)	2.50	1.90	1.90	2.50	1.90	2.00	2.25	3.50	2.00	2.10
(33)	1.90	.80	1.70	1.75	1.45	1.75	1.75	3.00	1.75	2.00
(34)	1.60	1.50	.90	1.50	1.80	1.50	1.75	2.75	1.25	1.40
(35)	50.00	35.00	42.00	35.00	26.00	60.00	25.00	50.00	40.00	40.00
(36)	30.00	28.50	28.00	20.00	19.50	50.00	25.00	35.00	25.00	30.00
(37)	30.00	20.00	14.00	30.00	35.00	25.00	25.00	22.50	25.00	25.00
(38)	20.00	20.00	10.00	17.50	29.00	15.00	25.00	20.00	15.00	15.00
(39)	200.00	50.00	60.00	100.00	175.00	60.00	200.00	60.00	50.00	125.00
(40)	1.60	2.25	1.70	2.25	2.45	2.00	2.25	3.00	2.25	2.65
(41)	35.00	17.00	19.00	35.00	22.00	35.00	15.00	50.00	50.00	20.00
(42)	25.00	17.00	11.50	25.00	26.00	15.00	15.00	18.50	20.00	8.00
(43)	25.00	5.00	27.50	40.00	38.00	25.00	12.00	22.50	20.00	10.00
(44)	50.00	60.00	52.50	60.00	57.00	70.00	60.00	45.00	70.00	45.00
(45)	75.00	65.00	73.50	100.00	75.00	70.00	80.00	84.00	75.00	75.00
(46)	100.00	100.00	52.50	100.00	100.00	75.00	100.00	40.00	50.00	20.00
(47)	.75	.70	.85	1.00	1.65	1.00	1.00	.75	1.00	.70
(48)	.75	.20	.80	.80	.23	1.00	1.00	.75	1.00	.70
(49)	4.50	3.00	3.70	4.00	2.75	3.90	3.30	4.50	4.50	4.80
(50)	4.20	3.00	3.40	3.50	2.45	3.55	3.00	4.00	4.50	4.50
(51)	5.60	5.00	4.70	5.00	4.65	4.80	4.25	5.50	5.50	6.25
(52)	4.85	3.60	4.20	4.25	3.45	4.00	4.00	5.00	4.50	5.40
(53)	4.03	4.00	2.95	2.75	2.20	3.00	3.25	3.00	3.00	3.10
(54)	4.75	4.50	3.60	3.50	2.95	3.40	4.25	3.50	3.50	4.00
(55)	75.00	10.00	19.00	25.00	55.00	40.00	45.00	45.00	50.00	20.00
(56)	7.50	9.00	8.40	8.00	9.50	10.00	10.00	22.50	20.00	40.00
(57)	.60	.50	.50	.50	.45	.50	.55	.60	.50	.50
(58)	5.00	5.00	5.00	4.00	4.10	5.00	4.00	5.50	5.00	7.00
(59)	5.00	5.00	5.00	4.00	3.85	5.00	4.00	5.50	5.00	7.50
(60)	2.00	2.00	1.15	1.00	1.35	2.00	1.00	1.75	1.50	2.00
(61)	.75	.60	.85	.80	1.05	1.00	.90	1.50	1.00	.71
(62)	2.50	2.40	2.30	2.20	2.45	2.50	2.25	2.35	3.00	2.40
(63)	.60	.35	.44	.45	.85	.40	.70	2.80	.50	.60
(64)	.70	.35	.48	.55	1.10	.50	.85	3.50	.65	.70
(65)	2.00	5.00	2.40	1.10	3.85	1.00	4.00	6.50	2.00	2.60
(66)	16.00	15.00	14.90	16.00	18.50	19.70	20.00	19.00	17.00	19.00

Arizona—Navajo County—C.A.A.—Paving

Williams Construction Co., Los Angeles, Calif., submitted the low bid to the Civil Aeronautics Administration, Santa Monica, Calif., of $227,423 for the reconstruction of existing landing strip and taxi-ways pavement work located at Winslow, Arizona, airport. The following bids were taken:

(A) Williams Construction Co. $227,423
(B) Phoenix-Tempe Stone Co. 238,246
(C) Wallace & Wallace 241,220
(D) W. J. & J. C. Henson 244,258
(E) Morrison-Knudsen Co. 262,743
(F) Axman & Miller 279,800
(G) Guerin Bros. $291,378
(H) Tanner Construction Co. 294,685
(I) Gibbons & Reed 301,012
(J) Frontier Construction Co. 326,460
(K) Isbell Construction Co. 404,173

(1) Lump sum, traffic test rolling 40,000-lb. wheel load first 25 hours.
(2) 200 hrs. traffic tests rolling addtl. hrs.
(3) 80,000 sq. yd. removal of existing pavement.
(4) 25,000 cu. yd. grading, unclass.
(5) 400 cu. yd. borrow.
(6) 500 M gal. watering.
(7) 35,000 cu. yd. sub-base course, gravel and salvaged pave.
(8) 2,000 M. gal. watering.
(9) 25,000 T. crushed gravel base crse, 2-in. size.
(10) 1,000 M. gal. watering.
(11) 40,000 gal. liquid asph., grade MC-1 (base course treatment).
(12) 23,000 T. asph. conc.
(13) 900 T. asph. conc. (special) crushed rock.
(14) 1,440 T. paving asph. (120-150 penetration).
(15) 110,000 gal. emulsified asph., penetration grade (seal coat).
(16) 2,700 T. mineral aggr. (seal coat).
(17) 35,000 gal. liquid asph., grade RC-1 (tack coat).
(18) 180 lin. ft. 1-way bank in gravel envel., per ft.
(19) 980 lin. ft. 2-way bank in conc. envel., per ft. of run.
(20) 180 lin. ft. 6-way bank in conc envel., per ft. of run.
(21) 1,000 lin. ft. trench and backfill for cable, 18-in. depth.
(22) 1,000 lin. ft. installing cable in trench.
(23) 1,700 lin. ft. installing cable in duct.
(24) 16 ea., raise existing flush lights.
(25) 82 ea., cover existing flush lights.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
(1)	500.00	875.00	750.00	600.00	324.00	$1,000	570.00	$2,500	$2,860	$1,500	$6,250
(2)	14.00	14.00	16.00	25.00	13.00	15.00	15.00	10.00	21.00	3.75	50.00
(3)	.15	.09	.17	.10	.195	.22	.30	.25	.085	.21	.40
(4)	.55	.39	.60	.80	.65	.55	.50	.50	1.90	.82	.80
(5)	4.50	.70	.75	1.00	1.30	1.00	1.00	1.00	1.20	1.00	1.00
(6)	1.50	1.25	1.60	1.75	1.62	1.75	1.60	1.25	1.50	1.65	3.00
(7)	.80	1.16	.90	1.30	1.00	1.60	1.55	2.00	1.75	2.43	1.00
(8)	1.40	1.25	1.60	1.75	1.62	1.75	1.60	1.25	1.50	1.65	3.00
(9)	1.17	1.40	1.10	1.15	1.36	1.25	1.40	1.30	1.35	1.21	2.00
(10)	1.40	1.25	1.60	1.75	1.61	1.75	1.60	1.25	1.50	1.65	3.00
(11)	.11	.105	.135	.10	.13	.11	.12	.12	.11	.13	.20
(12)	2.60	2.75	2.60	2.40	2.72	2.95	3.10	2.75	2.60	3.00	4.00
(13)	6.00	4.65	5.00	5.00	6.17	5.50	6.25	10.00	5.50	6.00	18.00
(14)	23.00	23.00	25.00	22.00	24.60	24.00	25.00	22.00	23.50	27.00	30.00
(15)	.12	.12	.12	.11	.13	.14	.14	.13	.13	.13	.30
(16)	3.80	4.00	4.90	5.00	6.30	5.00	4.85	5.50	4.25	4.20	10.00
(17)	.12	.105	.14	.095	.13	.12	.12	.12	.12	.125	.25
(18)	1.25	.88	2.30	1.20	2.00	1.00	1.00	2.00	1.50	1.30	1.00
(19)	1.50	2.25	3.10	3.00	2.90	3.00	1.85	3.50	2.75	2.60	3.00
(20)	4.00	5.50	5.30	5.50	7.10	7.00	6.85	5.00	6.00	7.80	7.00
(21)	.30	.17	.50	.40	1.30	.25	.80	.50	.85	1.00	.50
(22)	.10	.12	.50	.08	.52	.05	.17	.50	.06	.15	.25
(23)	.15	.12	.50	.08	.26	.05	.35	.50	.06	.30	2.00
(24)	50.00	45.00	20.00	10.00	65.00	35.00	35.00	35.00	37.00	25.00	150.00
(25)	1.50	4.50	2.00	8.00	5.00	6.00	3.50	15.00	3.75	7.00	11.50

MAJOR ASSEMBLIES QUICKLY REMOVABLE

● Major machinery units on the new Koehring 205 are quickly and easily removed. No need to disconnect other assemblies when only the drumshaft, or the boom hoist, or the traction gear case, needs attention. Lift out only the part you want for convenient bench work. For major overhauls, the entire machinery support frame lifts off . . . as a unit . . . with all the machinery that's attached to it.

Typical of the quickly removable major machinery units of the new Koehring 205 is the independent traction unit, the assembly that makes possible the 205's independent travel while swinging, hoisting, raising or lowering the boom. The entire assembly can be lifted out without disconnecting any of the other main operating units.

KOEHRING COMPANY
MILWAUKEE 10, WISCONSIN

HEAVY-DUTY CONSTRUCTION EQUIPMENT

HARRON, RICKARD & McCONE CO., San Francisco-Los Angeles • PACIFIC HOIST & DERRICK CO., Seattle, Wash. • WESTERN CONSTRUCTION EQUIPMENT CO., Billings • CONTRACTORS EQUIPMENT CORP., Portland • LUND MACHINERY CO., Salt Lake City • NEIL B. McGINNIS CO., Phoenix, Ariz. HARRY CORNELIUS CO., Albuquerque, New Mexico • KOEHRING COMPANY WEST COAST PARTS WAREHOUSE, Sacramento, California.

Highway and Street . . .

New Mexico—Lincoln County—State—Grade and Surface

E. M. Silver, Albuquerque, submitted the low bid to and was awarded the contract by the New Mexico Highway Dept. at $135,243, for the construction of 8.77 miles of highway north and south of Corona, N. M.. The following unit bids were received:

(1) E. M. Silver $135,243
(2) Henry Thygesen Co. 154,787
(3) Peter Kiewit & Sons 161,590
(4) Allison & Armstrong $171,022
(5) Skousen Construction Co. 174,039
(6) W.T. Bookout Construction Co. 198,555

		(1)	(2)	(3)	(4)	(5)	(6)
Lump sum,	removal of old drainage structs.	600.00	900.00	$1,200	400.00	500.00	$2,000
46,300 cu.	yd. excavation, unclassified	.83	.95	.70	1.50	1.25	1.00
70 cu.	yd. excavation for structures	2.00	2.00	2.00	2.00	2.00	5.00
165 cu.	yd. excavation for pipe culverts	2.00	2.00	2.00	2.00	2.00	3.00
134,500 sta.	yd. overhaul	.02	.04	.02	.03	.05	.05
6,500 ¼ mi.	yd. haul	.10	.10	.10	.10	.15	.10
450 hour	rolling, sheepsfoot roller	4.00	5.00	6.50	4.50	4.00	5.00
606 hour	rolling, steel tired roller	8.00	4.50	5.50	5.00	4.00	5.00
790 M.	gal. watering	4.00	4.50	4.60	3.50	4.00	6.00
25 cu.	yd. Class "A" conc., box culv. and cut-off wall	40.00	40.00	50.00	50.00	40.00	40.00
13 cu.	yd. Class "A" concrete curbing	40.00	40.00	50.00	30.00	40.00	40.00
49 sq.	yd. Class "A" conc., ditch paving 4-in. thick	3.00	6.00	5.25	3.50	4.00	5.00
2,100 lb.	reinforcing steel	.15	.15	.09	.15	.15	.20
16 lin.	ft. standard reinf. conc. culv. pipe, 12-in. diam.	4.50	2.50	5.00	2.50	4.00	3.00
52 lin.	ft. standard reinf. conc. culv. pipe, 24-in. diam.	6.00	5.00	8.00	5.00	5.00	5.50
168 lin.	ft. standard reinf. conc. culv. pipe, 30-in. diam.	8.00	5.80	10.00	6.50	7.00	6.50
64 lin.	ft. standard reinf. conc. culv. pipe, 36-in. diam.	10.00	7.00	13.00	8.00	10.00	8.50
3,135 lin.	ft. removing and rebuilding fence	.25	.15	.14	.05	.25	.10
32,358 ton	ballast	.90	.90	1.25	.90	.90	.90
16,013 ton	base course surfacing	.84	.98	1.45	1.02	1.25	2.25
756 bbl.	cutback asphalt, Type MC-1	4.10	5.00	5.40	5.00	4.50	5.25
8,324 ton	top course surfacing	.93	1.10	1.25	1.02	1.25	2.25
2,588 bbl.	cutback asphalt, Type MC-3	4.10	5.50	5.40	5.00	4.50	5.25
8.775 mile	mixing asphalt and aggregate	600.00	900.00	500.00	500.00	800.00	500.00
643 bbl.	200-300 penetration asphalt	4.20	5.50	5.70	5.00	5 00	5.25
794 ton	cover material	4.00	4.50	6.00	5.00	7.00	6.00
2,655 lin.	ft. oil processed curb	.30	60	.60	.20	1.00	3.50
149 hour	mechanical tamping	5.00	6.00	6.00	3.50	5.00	10.00
260 lb.	wire fabric reinforcement	.10	.20	.11	.15	20	.20
10 each	new posts for rebuilding fence	1.00	.50	.55	1.50	.75	2.50
2.748 mile	scarifying and reshaping	150.00	250.00	200.00	150.00	400.00	800.00
69 each,	removing and resetting right of way	3.00	4.00	6.00	1.50	2.00	4.00

California—Tulare County—State—Paving

Brown, Doko and Baun of Pismo Beach, submitted the low bid to the California Division of Highways of $118,504.10, for the repair of 13.5 miles of highway by placing plant-mix surfacing and applying seal coat. The following unit bids were submitted:

(A) Brown, Doko & Baun $118,504
(B) Griffith Company 125,066
(C) Union Paving Co. 129,434
(D) W. C. Railing 136,674
(E) A. Teichert & Co. 139,925
(F) Louis Biasotti & Sons $149,015
(G) J. E. Haddock, Ltd. 150,304
(H) M. J. Ruddy & Sons 151,554
(I) N. M. Ball & Sons 153,488
(J) Guerin Bros. 172,367

Location 1
(1) 90 tons asphaltic emulsion (paint binder and seal coat.
(2) 8,650 tons mineral aggregate (P.M.S.)
(3) 435 tons packing asphalt (P.M.S.)
(4) 590 tons screenings (seal coat)
Location 2
(5) 49 tons asphaltic emulsion (paint binder and seal coat).
(6) 4,900 tons mineral aggregate (P.M.S.).
(7) 245 tons paving asphalt (P.M.S.).
(8) 340 tons screenings (seal coat).
Location 3
(9) 86 tons asphaltic emulsion (paint binder and seal coat).
(10) 12,720 tons mineral aggregate (P.M.S.).
(11) 636 tons paving asphalt (P.M.S.).
(12) 585 tons screenings (seal coat).

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	30.00	36.00	25.00	35.00	32.50	30.65	40.00	28.70	29.70	35.00
(2)	3.83	3.80	4.75	4.60	4.95	5.08	4.80	5.20	5.17	5.80
(3)	15.00	16.00	15.50	18.00	19.30	16.00	18.50	16.30	14.80	17.00
(4)	4.50	4.90	3.75	4.60	4.30	4.60	4.50	4.90	4.40	4.50
(5)	30.00	36.00	25.00	32.50	32.50	30.65	40.00	28.70	29.70	35.00
(6)	2.98	3.10	3.20	3.30	3.35	3.90	3.95	4.06	4.31	4.85
(7)	14.50	16.00	15.50	18.00	18.00	16.00	17.60	16.30	14.80	17.00
(8)	4.50	4.60	3.50	4.50	4.30	4.30	4.30	4.55	4.40	4.15
(9)	30.00	36.00	25.00	32.50	32.50	30.65	40.00	28.70	29.70	35.00
(10)	2.98	3.20	3.25	3.35	3.35	4.03	3.95	4.06	4.31	4.85
(11)	14.50	16.00	15.50	18.00	18.00	16.00	17.60	16.30	14.80	17.00
(12)	4.50	4.60	3.25	4.50	4.30	4.40	4.30	4.60	4.40	4.15

Washington—Cowlitz County—State—Grade & Surf.

Strong and MacDonald, Tacoma, Wash., submitted the bid of $202,790, which was rejected by the Director of Highways at Olympia, Wash., for construction of 1.59 mi. of Highway No. 1 between Kalama and the Kalama river. The work included clearing, grubbing, excavating, surfacing, and the appurtenant drainage system. Unit quantities are as follows:

18.46 ac.	clearing 500.00
4.42 ac.	grubbing 500.00
1,190 cu.	yd. common excav., including haul ..... .30
2,920 cu.	yd. solid rock excav., including haul 1.00
240 cu.	yd. common trench excav., including haul 1.00
860 cu.	yd. structure excav. 1.50
384,270 cu.	yd. hydraulic embankment in place ..... .43
5,590 cu.	yd. hydraulic material in stockpile ..... .43
130 cu.	yd. gravel backfill in place 5.00
165 cu.	yd. crushed stone surf. top course in place 7.50
215 cu.	yd. cr. stone surf. base course in place 7.50
66.1 cu.	yd. conc., Class A, in place 55.00
8,400 lb.	steel reinf. bars in place ..... .10
24 lin.	ft. standard open wood flume in place 5.00
171 lin.	ft. W. I. water pipe 4-in. diam. in place 4.00
Lump sum,	remov. and replac. navigation light 1.00
96 lin.	ft. pl. conc. or V.C. culv. pipe 12-in. diam 1.25
219 lin.	ft. std. reinf. conc. culv. pipe 24-in. diam 4.00
99 lin.	ft. std. reinf. conc. culv. pipe 30-in. diam 7.00
225 lin.	ft. std. reinf. conc. culv. pipe 36-in. diam 10.00
165 lin.	ft. std. reinf. conc. culv. pipe 48-in. diam 12.00

CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than $10,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information: County of job location (capital letters); name a address of contractor (bold face); bid price; brief description of work; awardi agency; and approximate date of award. More detailed information on many these projects is often available, and will gladly be furnished upon your requ to the Editor, WESTERN CONSTRUCTION NEWS, 503 Market Street, San Francis

CONTRACTS AWARDED

Large Western Projects...

Holland Page, Austin, Texas, has been awarded a contract at $216,764 for reconditioning 38.3 mi. of Highway No. 90, with flexible base and single asphalt surface treatment, from 5.5 mi. east of Alpine to 13.9 mi. east of Marathon, Texas, by State Highway Department, Austin, Texas.

Haas Construction Co. and **Peter Kiewit Sons Co.,** San Francisco, Calif., were awarded a $548,554 contract to construct improvements to the flying field and facilities to support HTA operations at the Naval Air Station, Moffett Field, Calif., by Bureau of Yards and Docks, Washington, D. C.

H. W. Reed, Cheyenne, Wyoming, received a $245,015 contract for base course surfacing, oil treatment by the road mix method, sand seal coat and miscellaneous work on the Gillette-Douglas Road, Wyo., by State Highway Commission, Cheyenne, Wyo.

Basalt Rock Co., Inc., Napa, Calif., was awarded a $1,175,967 contract to construct a breakwater at the Naval Air Station, Alameda, Calif., by Bureau of Yards and Docks, Washington, D. C.

The Everett Pacific Shipbuilding and Drydock Co., Everett, Wash., received a $2,000,000 contract to construct two floatin drydocks with 1,900-ton lift capacity at Everett, Wash., b Bureau of Yards and Docks, Washington, D. C.

Willis F. Lynn, Oakland, Calif., received a $475,900 contract fo the construction of additions to Berkeley General Hospital a Berkeley, Calif., by Berkeley General Hospital, Berkeley, Cali

M. H. Golden, San Diego, Calif., received a multi-million doll contract for the construction of storehouse additions at the Nav Air Station, Spanish Bight, San Diego, Calif., by Bureau Yards and Docks, Washington, D. C.

Shumaker and Evans Construction Co. and **P. W. Womack,** Lo Angeles, Calif., were awarded a $462,249 contract to construc 200 Navy dwelling units at Oceanside, Calif., by Federal Publ Housing Authority, San Francisco, Calif.

Stoneson Bros., San Francisco, Calif., have the $1,123,200 con tract for the construction of 208 residences at Daly City, to b known as Edgewood Terrace, Calif., by self.

Maxon Construction Co., Inc., Cincinnati, Ohio, received th $6,291,000 contract for expansion of the existing naval ammuni tion depot at Hastings, Nebraska, by Bureau of Yards an Docks, Washington, D. C.

Panhandle Carbon Co., Inc., New York, N. Y., has a $2,000,00 contract for the construction of additional plant facilities a Eunice, New Mexico, by Plant Defense Corp., Washingto D. C.

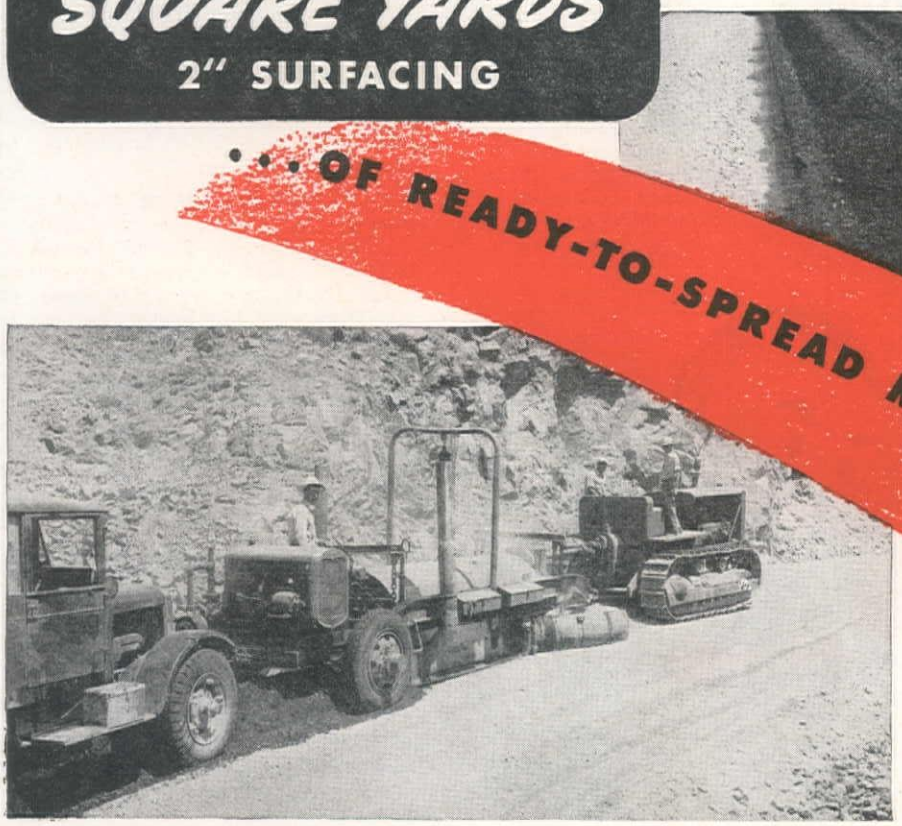
Stone and Webster Co., Boston, Mass., received a $3,000,000 con

AS MUCH AS

40,000 SQUARE YARDS

2" SURFACING

. . . OF READY-TO-SPREAD MIX per day!



WOOD ROADMIXER Combines *Quantity* and *Quality* With Low Cost!

40,000 square yards per day *is* unusual production for a Wood Roadmixer, but it can be done. Of prime importance, however, is the fact that such production is achieved with minimum equipment and man power.

The Wood Roadmixer is a *complete* traveling mixing plant. A working unit consists of three pieces of equipment, the Wood Roadmixer, a crawler tractor which pulls and powers the Roadmixer, and a binder supply truck. Two men can handle the average job. Traveling at a regulated speed with synchronized mixing, the Wood Roadmixer produces in *one pass* a predetermined mix ready in minutes for spreading.

Using native or local materials and handling road oil, emulsion or soil-cement mixes, the Wood Roadmixer provides obvious savings in equipment, materials and labor. The long life and low maintenance record of Wood Roadmixer paving is conclusive proof of its high quality.

Wood Roadmixers are made in two sizes, handling up to 8 cu. ft. windrows. Sold by leading equipment dealers throughout the United States. For literature and costs, see your nearest dealer or write direct.

ROADBUILDING EQUIPMENT

WOOD MANUFACTURING CO.

816 WEST FIFTH ST. LOS ANGELES 13, CALIF.

tract for the construction of additional plant facilities at Guymon, Oklahoma, by Defense Plant Corp., Washington, D. C.

Halvorson Construction Co., Salem, Ore., has a $393,686 contract for construction of 155 family dwelling units at Klamath Falls, Ore., by Federal Public Housing Authority, Portland, Ore.

Bechtel-McCone Co., Los Angeles, were awarded the $6,600,000 contract for construction of a toluene manufacturing plant to be located near Borger, Tex., by Defense Plant Corp., Washington, D. C.

Nelse Mortensen and Co., Seattle, Wash., has been awarded a $638,055 contract to construct a hospital unit and accessories at the naval hospital in Seattle, Wash., by Bureau of Yards and Docks, Washington, D. C.

Strand and Sons, Seattle, Wash., have received a $822,500 contract for the construction of a housing project at Sand Point, Wash., by Federal Public Housing Authority, Seattle, Wash.

Alaska Construction, Juneau, Alaska, has received a $551,000 contract to construct a housing project at Hoonah, Alaska, by Federal Public Housing Authority, Seattle, Wash.

Highway and Street . . .

California

ALAMEDA CO.—**Union Paving Co.**, 212 Babcock Bldg., San Francisco—$25,000 to construct streets in San Lorenzo Village prior to the construction of housing—by Greenwood Corp., San Mateo. 4-9

LOS ANGELES CO.—**Griffith Co.**, 50 L. A. Railway Bldg., Los Angeles—$10,57 for grading, paving and improving Rode Rd., between La Brea Ave. and Cloverdal Ave., Los Angeles—by Board of Publi Works, Los Angeles. 3-2

LOS ANGELES CO.—**J. Tomei Con struction Co.**, 4737 Orion Ave., Van Nuy —$10,287 for paving of dips and approache and otherwise improving Wilbur Ave Tampa Ave., Winnetka Ave., Mason Ave and Variel Ave. at the Los Angeles Rive Channel—by Board of Public Works, Lo Angeles. 3-2

LOS ANGELES CO.—**Fred D. Chad wick**, 4335 Brewster Ave., Lynwood, Cali —$109,776 for paving at the AAF Suppl Depot, Maywood—by U. S. Engineer Of fice, Los Angeles. 3-2

SAN DIEGO CO.—**V. R. Dennis Con struction Co.**, P. O. Box "F," Hillcres Station, San Diego—$10,967 for 0.4 mi plant mixed surfacing with seal coat to b applied on Orange Ave., Coronado — by State Dept. of Public Works, Sacramento 3-2

SAN DIEGO CO.—**Griffith Co.**, P. O. Box "G," Hillcrest Station, San Diego — for paving and relocation of roadway in con nection with grading work, the installation of concrete culverts and moving a railroad line at Cardiff—by Santa Fe Railroad Co. Los Angeles. 3-3

SAN DIEGO CO.—**V. R. Dennis Con struction Co.**, P. O. Box "F," Hillcrest Station, San Diego—$10,968 for 0.4 mi plant-mixed surfacing with seal coat to be applied on Orange Ave., between 100 ft south of 4th St. and 1st St., Coronado—by Calif. State Highway Dept., Sacramento 3-3

SAN JOAQUIN CO.—**George French, Jr.**, P. O. Box 307, Stockton—$13,860 for excavating, grading and paving of open storage areas at the Stockton Ordnance Depot—by U. S. Engineer Office, Sacramento. 3-2

SOLANO CO.—**J. A. Bryant**, 1815 Capital St., Vallejo—$48,049 for modification of crossovers and firewalls at the Benicia Arsenal—by U. S. Engineer Office, San Francisco. 3-2

SOLANO CO.—**E. A. Forde**, 640 Sir Francis Drake Blvd., San Francisco — $19,366 for resurfacing and regrading roads at U. S. Naval Hospital, Mare Island—by Bureau of Yards and Docks, Washington, D. C. 4-6

Idaho

BOUNDARY CO.—**Morrison-Knudsen Co., Inc.**, Boise—$45,000 for the construction of a roadbed 1 mi. long near Leonia—by Great Northern Railway Co. 3-19

New Mexico

LINCOLN CO.—**E. M. Silver**, 500 N. Amherst Ave., Albuquerque—$135,244 for construction of Project No. 194-B on U. S. Highway Route No. 54, north and south of Coroan. The work consists of oil treated top course surfacing—by State Highway Dept., Santa Fe. 4-4

SAN JUAN CO.—**J. E. Skousen**, Gallup, N. M.—$70,667 for oil treatment top course surfacing of 10 mi. road on State Highway Route No. 17—by State Highway Dept., Santa Fe. 4-4

TORRANCE & GUADALUPE COS.—**Skousen Construction Co.**, 201 Springer

FACTORY AND GENERAL OFFICES
LOS ANGELES, CALIF. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

Bldg., Albuquerque—$51,841 to surface and oil 6.2 mi. of U. S. Highway Route No. 54 between Vaughn and Duran—by State Highway Dept., Santa Fe. 4-4

Oregon

HARNEY CO.—**E. C. Hall Co.,** Route 6, Box 630, Portland, Ore.—$30,204 to supply approx. 11,920 cu. yd. crushed rock or crushed gravel in stock piles for Burns Rock Production Project on three State Highways—by Oregon State Highway Commission. 3-13

JACKSON CO.—**Norris & Philpott,** Portland—$18,532 to widen Trail bridge over the Rogue River and Crater Lake Highway. Work includes excavation, concrete, metal reinforcement, structural steel and metal handrail—by Oregon State Highway Dept. 3-13

JACKSON CO.—**Guerin Bros.,** 208 South Linden Ave., South San Francisco—$60,786 for 15,000 cu. yd. crushed gravel in stock piles at Prospect - Antelope Creek Rock Prod. Project on Crater Lake Highway and 10,200 cu. yd. crushed rock in stock piles at Union Creek Rock Prod. Project on Crater Lake and West Diamond Lake Highways — by Oregon State Highway Commission. 3-13

KLAMATH CO. — **Rogers Construction Co.,** Dayton, Wash.—$24,800 for 12,500 cu. yd. crushed rock in stock piles for Fort Klamath - Lobert Rock Prod. Project on five State Highways — by Oregon State Highway Commission. 3-13

KLAMATH CO. — **Rogers Construction Co.,** Dayton, Wash.—$18,727 for 8,000 cu. yd. crushed rock in stock piles for Chemult-Beaver Marsh Rock Prod. Project on The Dalles-California and East Diamond Lake Highways—by Oregon State Highway Commission. 3-13

LANE CO. — **Fisher Brothers,** Route 3, Box 168-A, Oregon City—$50,400 to supply 24,000 cu. yd. crushed rock or crushed gravel in stock piles for Trent-Salt Creek Falls Rock Prod. Project on Willamette Highway — by Oregon State Highway Commission. 3-13

LINN CO.—**Warren Northwest, Inc.,** P. O. Box 5072, Portland, Ore.—$72,796 for approximately 12,800 tons asphaltic concrete and 4,000 cu. yd. crushed rock of gravel shoulder material for Albany-Crabtree Corner section of the Santiam Highway—by Oregon State Highway Commission. 3-13

MULTNOMAH CO. — **Parker - Schram Co.,** Couch Bldg., Portland — $13,311 for construction of improvements to N. W. York St., Portland—by City Council, Portland. 3-30

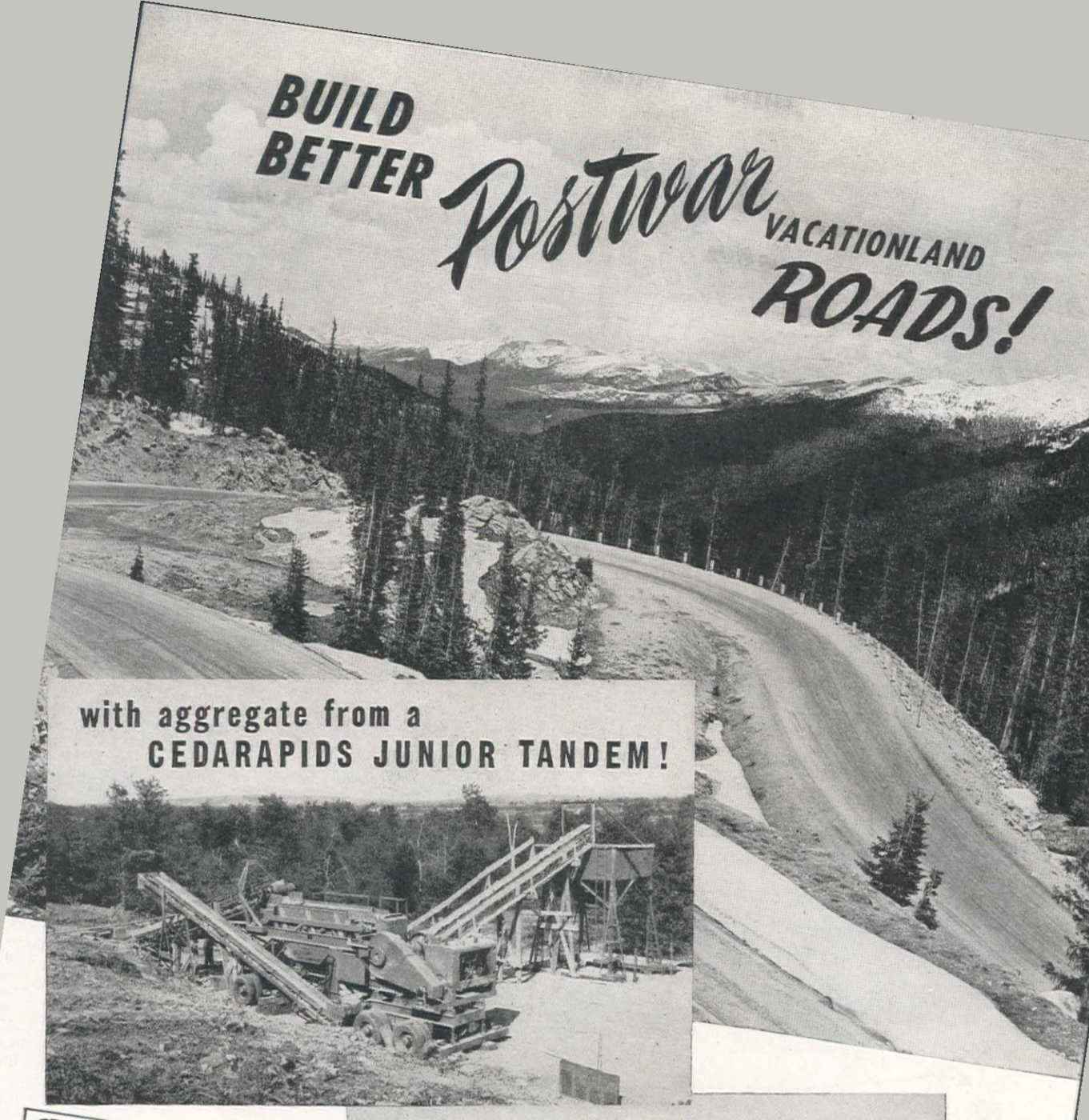
MULTNOMAH CO. — **Parker - Schram Co.,** Couch Bldg., Portland — $21,493 for asphaltic concrete pavement and miscellaneous items on Schmeer Road junction section of the Pacific Highway west—by State Highway Commission. 3-13

WASCO CO.—**Fisher Brothers,** Route 3, Box 168-A, Oregon City—$15,175 to supply 6,700 cu. yd. crushed rock in stock piles for the Maupin-Criterion Rock Prod. Project on The Dalles - California Highway—by Oregon State Highway Commission. 3-13

Texas

BREWSTER CO.—**Holland Page,** Box 1181, Austin—$216,764 for reconditioning 38.3 mi. of Highway No. 90 with flexible base and single asphalt surface treatment,

BUILD BETTER *Postwar* VACATIONLAND ROADS!



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ARMY E NAVY

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa

from 5.5 mi. east of Alpine to 13.9 mi. east of Marathon—by State Highway Department, Austin. 3-16

HUNT CO.—**Texas Bitulithic Co.,** 111 Commerce St., Dallas—$138,292 to pave 9.2 mi. of U. S. Highway 69 with asphalt concrete, from 3.1 mi. south of Greenville to Rains city limits—by State Highway Department, Austin. 3-16

REFUGIO CO.—**Heldenfels Brothers,** Rockport—for reshaping base course, prime coat and single asphalt surface treatment—by State Highway Department, Austin. 4-9

TOM GREEN & RUNNELS COS.—**Thomas & Ratliff,** Rogers—$207,503 to widen 33.1 mi. of concrete pavement with asphaltic concrete pavement, between San Angelo and Ballinger, on U. S. Highway 67—by State Highway Department, Austin. 3-16

Utah

WEBER CO.—**Perkins Construction Co.,** 626 Dooly Bldg., Salt Lake City—$67,811 for the construction of railroad trackage, paving and drainage and additions to the l.c.l. freight shed and utilities at the Utah A. S. F. Depot, Ogden—by U. S. Engineer Office, Salt Lake City. 4-5

Washington

FRANKLIN CO.—**Babler Brothers,** 4617 S. E. Milwaukee, Portland, Ore.—$39,373 for 14.5 mi. light bituminous surface treatment, 24.4 mi. non-skid single seal treatment and 6.4 mi. bituminous retread surfacing at Prosser—by Franklin County Commissioners, Prosser. 4-4

WALLA WALLA CO.—**J. H. Collins & Co.,** Walla Walla—$15,429 for construction of roads, service drives, sidewalks and parking areas at McCaw General Hospital, Walla Walla—by U. S. Engineer Office, Portland, Ore. 3-26

WHATCOM CO.—**Guy J. Norris,** 1411 4th Ave. Bldg., Seattle—$30,731 for grading, draining, surfacing and removing two bridges on 0.4 mi. Secondary State Highway No. 1—by Washington State Highway Dept., Olympia. 4-10

Wyoming

CAMPBELL & CONVERSE COS.—**H. W. Reed,** Cheyenne—$245,015 for base course surfacing, oil treatment by road-mix method, sand seal coat and miscellaneous work on 39.6 mi. of the Gillette-Douglas Road—by Wyoming State Highway Commission, Cheyenne. 4-16

SWEETWATER CO.—**Gibbons and Reed,** 259 W. 3rd St., Salt Lake City—$16,186 for construction of three reinforced concrete culverts and miscellaneous work on Rock Springs-Hiawatha Road—by Wyoming State Highway Commission, Cheyenne. 4-16

Bridge . . .

California

MONTEREY CO.—**Dan Caputo,** 985 Delmas Ave., San Jose—$11,130 for construction of a reinforced concrete farm road undercrossing about 24 mi. north of the San Luis Obispo Co. line on State Route No. 56—by California State Dept. of Public Works, Sacramento. 4-9

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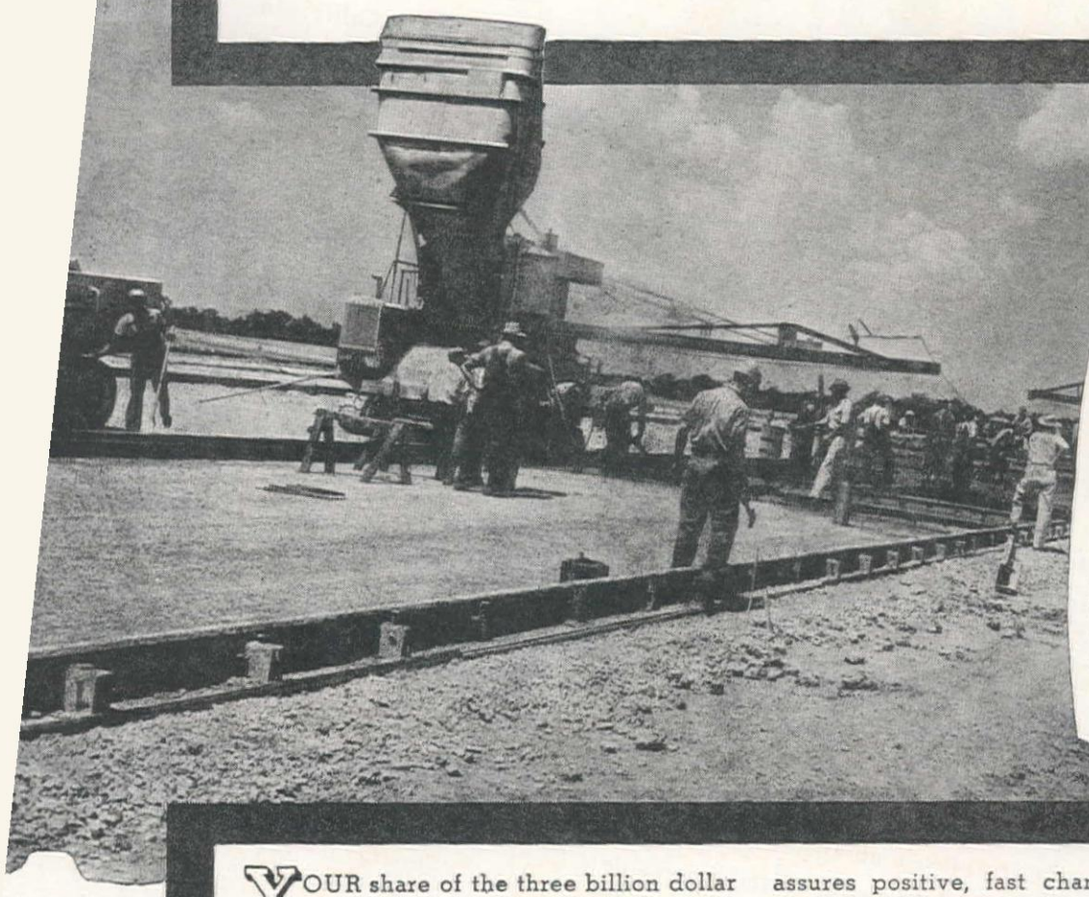
with MultiFoote Pavers



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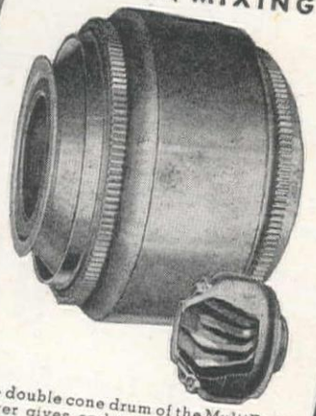

The double cone drum of the MultiFoote Paver gives end-to-end scouring action that insures a complete and thorough mix of every batch. There are no sharp angle corners where the mix can adhere and build up and be hard to clean. Openings are fitted with renewable wearing rings. Cut-away section shows drum interior and blade design.

YOUR share of the three billion dollar annual postwar highway construction program will be more profitable if you have the combination of features provided by MultiFoote Pavers for speeding up production. Their records for speed and low cost paving of highways and airports everywhere are the reasons why there are more MultiFoote Pavers in service than any other make.

The big, wide, solid skip, which can take the battering of any batch truck, assures positive, fast charging without spilling. Double cone drum provides complete and thorough mix of every batch. Water system is simple, accurate and independent of water pressure. Rotary discharge takes only a quarter turn to kick concrete into the big bucket ready to speed out the long boom to be discharged. High operating platform permits greater visibility and faster, more accurate work.

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ARMY E NAVY

MULTIFOOTE CONCRETE PAVERS

Washington

PIERCE CO.—**Hart Construction Co.,** 3536 E. 11th St., Tacoma—$41,692 for reconstruction of the Point Fosdick cradle of the Tacoma ferry system on Primary State Highway 14—by Washington State Highway Dept., Olympia. 4-10

WHATCOM CO.—**Axel Osberg,** 6206 Phinney, Seattle—$67,613 for clearing, grading, surfacing and construction of six concrete bridges on State Highway No. 1, Austin Pass branch, Glacier to Mt. Baker—by Washington State Highway Dept., Olympia. 4-10

Airport . . .

California

ALAMEDA CO.—**Marshall S. Hanrahan,** Box 429, Redwood City—$476,663 for drainage, mooring eyes and paving, east of carrier pier, Naval Air Base, Alameda—by Bureau of Yards and Docks, Washington, D. C. 4-11

SAN BERNARDINO CO.—**McClannahan, Mullenaux & Roberts,** P. O. Box 217, Arlington, Riverside—$26,650 for drainage and dust control facilities at Muroc Flight Test Base, Muroc—by U. S. Engineer Office, Los Angeles. 4-4

SANTA BARBARA CO.—**Clyde W. Wood, Inc.,** 816 W. 5th St., Los Angeles—$125,916 for the reconstruction and resurfacing of runway and taxiway pavements at the Santa Maria Army Air Field, Santa Maria—by U. S. Engineer Office, Los Angeles. 4-16

SANTA CLARA CO.—**Haas Construction Co.** and **Peter Kiewit Sons Co.,** 326 Merchants Exchange Bldg., San Francisco—$548,554 for improvements to flying field and facilities to support HTA operations at the Naval Air Station, Moffett Field. Work includes buildings, earthwork, oiled roads, concrete construction, iron and steel work, etc.—by Bureau of Yards and Docks, Washington, D. C. 4-3

Nevada

CLARK CO.—**H. W. Polk,** 5201 San Fernando Rd., Glendale, Calif.—$93,090 for the construction of additional roads and aprons at the Las Vegas Army Air Field, Las Vegas—by U. S. Engineer Office, Los Angeles, Calif. 4-10

Texas

EL PASO CO.—**Townsco Contracting Co.,** Box 675, Oklahoma City, Okla.—to mark runways and taxiways at the Municipal Airport—by Civil Aeronautics Administration, Fort Worth. 4-2

Washington

KING CO.—**Northwest Precote Inc.,** 7343 E. Marginal Way, Seattle—$48,103 for paving and reconstruction of a taxiway at Boeing Field, Seattle—by U. S. Engineer Office, Seattle. 3-30

Water Supply . . .

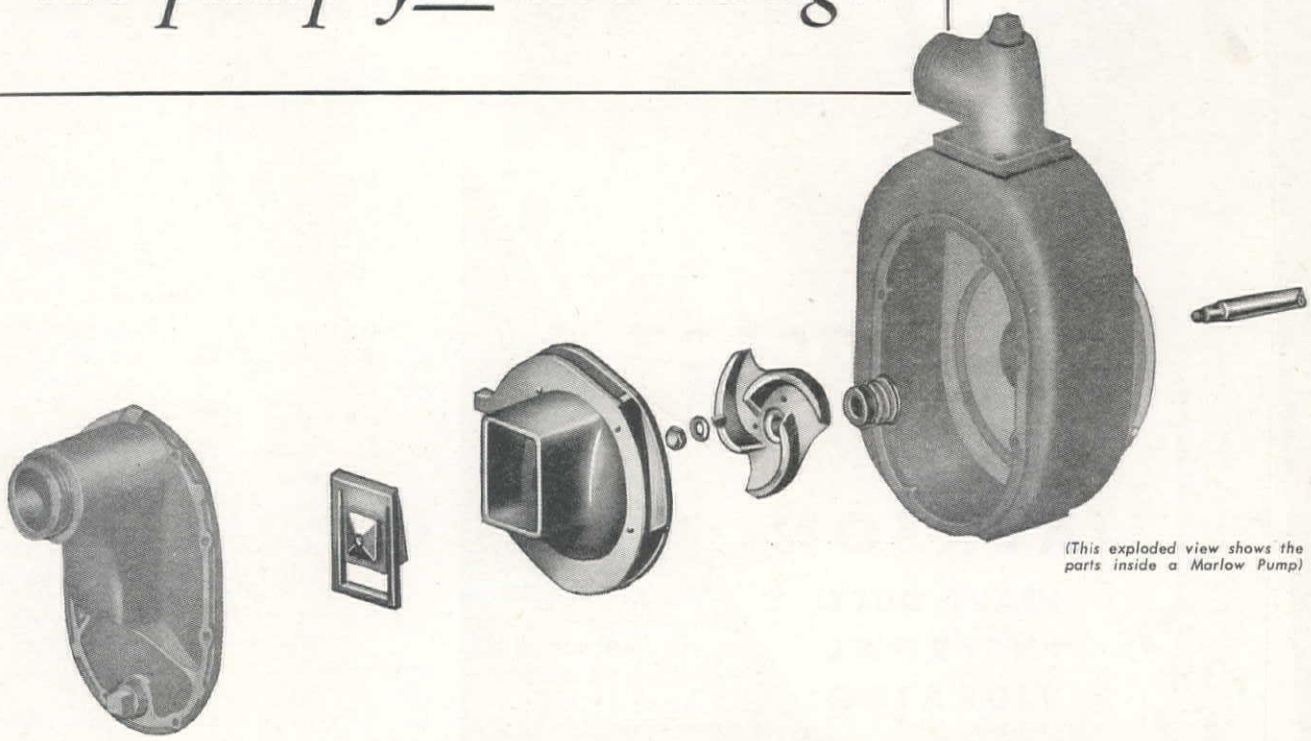
California

CONTRA COSTA CO.—**Peter Sorensen,** 927 Arguello St., Redwood City—$51,557 to install draft stops and a water supply system at Parr, Richmond Terminal—by

Have you looked

INSIDE

the pump you are using?



(This exploded view shows the parts inside a Marlow Pump)

. . . You should do so. If it's a Marlow Self-Priming Centrifugal, you will find that its parts are few and uncomplicated. In a Marlow, the rotating impeller is the only operating part. The ability to self-prime is inherent in the exclusive, patented diffuser design of the pump—it is not dependent on the action of any auxiliary contrivance. A Marlow is one of those classic machines which demonstrate that simplicity is the essence of efficiency. There is no other pump like a Marlow. Sizes to handle 50 to 3600 GPM.

The Marlow engineers have just published the first authoritative treatise on self-priming centrifugal pumps. It tells, objectively, the superiority of the principle employed in Marlows. You should have a copy for your technical file. Write—it's free. MARLOW PUMPS, RIDGEWOOD, N. J.

★ Engineered by Marlow ★

U. S. Engineer Office, San Francisco. 4-16

IMPERIAL CO.—**Chicago Bridge and Iron Co.,** Chicago, Ill.—$11,480 for construction of an elevated steel water tank, Coachella Canal, Government Camp, All American Canal System, Boulder Canyon Project—by Bureau of Reclamation, Denver, Colo.

SAN DIEGO CO.—**B. G. Carroll,** 2260 Main St., San Diego—$25,989 for construction of the 19th St. water main of cement lined, cast iron pipe and appurtenances—by City Council, San Diego. 4-16

SAN DIEGO CO.—**L. B. Butterfield,** 2035 Main St., San Diego—$31,920 for the construction of the B St. water main consisting of approximately 4,800 ft. of 16-in., class 150, cement lined, cast iron pipe—by City Council, San Diego. 4-6

SAN FRANCISCO CO.—**E. J. Tobin,** 1000 Carleton St., Berkeley—$45,169 to lay 12-in., cast iron, class 250 water main in Congo, Santa Rosa, Mission and Brazil Sts., from Joost to Moscow Sts., San Francisco—by Public Utilities Commission, San Francisco. 3-23

SANTA BARBARA CO.—**C. B. Neeley,** 4586 Modoc Rd., Santa Barbara—$7,500 for the construction of a water well and pumping facilities at the Marine Corps Air Station, Santa Barbara—by Bureau of Yards and Docks, Washington, D. C.

Oregon

DOUGLAS CO.—**Goerig & Phip,** 2384 N. W. Savier, Portland—$15,000 for the construction of additions to a reservoir north of Roseburg—by California Oregon Power Co., Portland. 4-2

MULTNOMAH CO.—**Oscar Butler and Son,** 4900 N. E. 42nd St., Portland—$109,955 for furnishing and installing water supply line from Portland city water supply system along Canyon Rd. and extending to the district's storage tank, and the installation of feeder and distribution mains inside the district at Portland—by West Slope Water District, Portland. 4-17

Texas

BEXAR CO.—**Wahrmund - Logan Co.,** San Antonio—$28,774 to construct changes in the water distribution system at San Antonio ASF Depot—by U. S. Engineer Office, San Antonio. 3-20

TARRANT CO.—**Glade Construction Co.,** Century Bldg., Fort Worth—$142,200 for installing Holly Pumping Plant—by City Council, Fort Worth. 3-26

Washington

KING CO.—**Brazier Construction Co.,** 309 Pontius N., Seattle—$3,200 for construction surge tank extensions, overflow drains and pipe supports at cold storage plant, Seattle—by U. S. Engineer Office, Seattle. 3-26

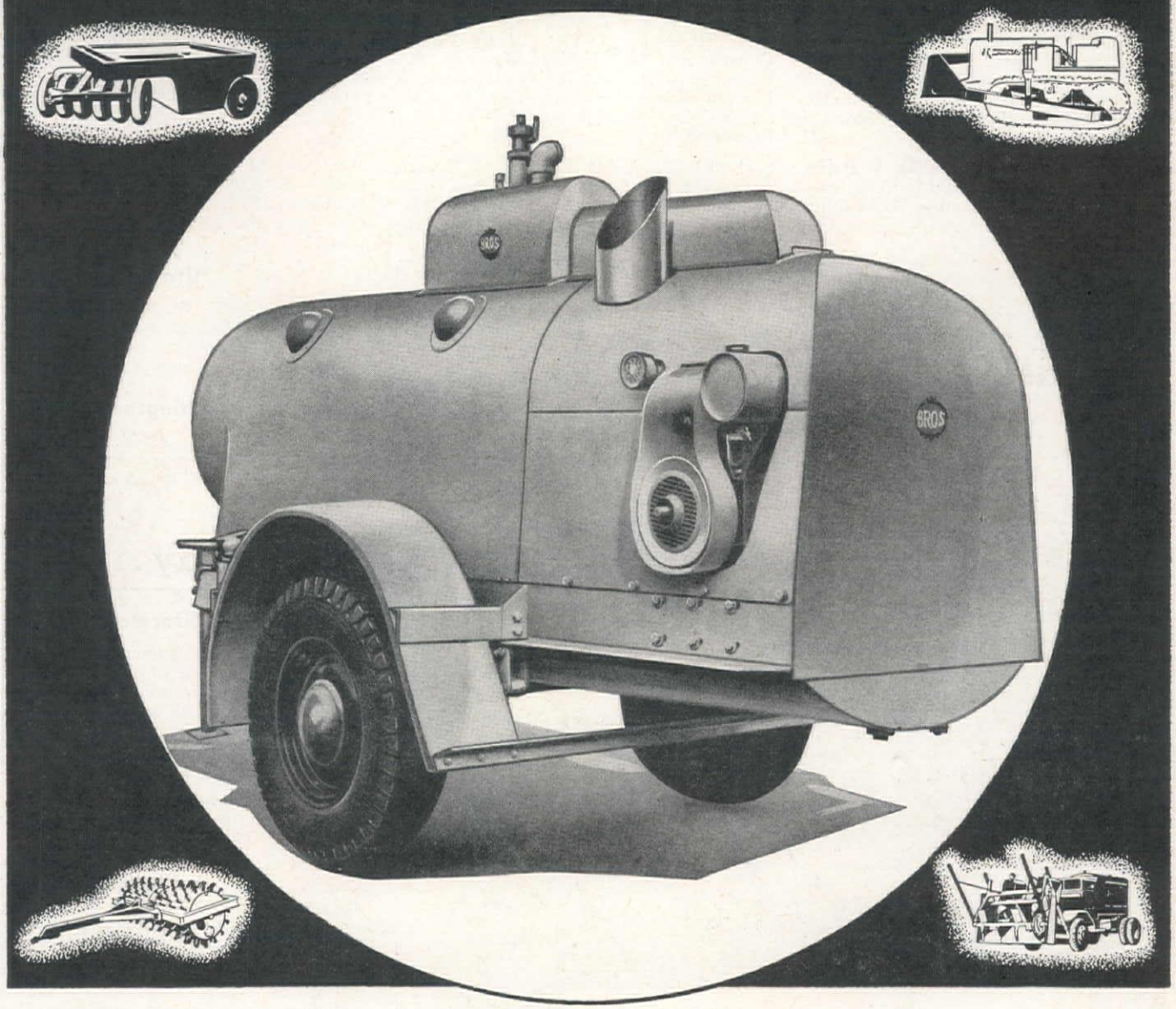
YAKIMA CO.—**A. A. Durand and Son,** Walla Walla—$25,000 to dig a well for the Nob Hill Water District, Yakima—by Nob Hill Water Co. 3-15

Sewerage . . .

California

ALAMEDA CO.—**Manuel Smith,** 313 Syndicate Bldg., Oakland—$239,289 for the construction of vitrified sewers in the Ashland area, Oro Loma Sanitary District

HEAT AND POWER



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BROS

FABRICATORS OF STEEL • BOILERS • STOKERS • TANKS • ROAD EQUIPMENT

—by Oro Loma Sanitary District, Hayward. 3-23

FRESNO CO.—**Stewart & Nuss, Inc.,** 410 Thorne Ave., Fresno—$3,835 for the construction of vitrified clay pipe sewers, Y branches and concrete manholes with cast iron frame and cover at Fresno—by City Council, Fresno. 3-22

LOS ANGELES CO.—**George Miller,** 2147 Silver Lake Dr., Los Angeles—$21,306 for construction of a sanitary sewer in Coldwater Canyon Ave., from Riverside Dr. to Moorpark St., Los Angeles—by Board of Public Works, Los Angeles. 3-23

LOS ANGELES CO.—**Culjak & Dzida,** 1354 S. Bonnie Beach Pl., Los Angeles—$12,237 for the construction of sanitary sewers and appurtenances in Irvine Ave. and Magnolia Blvd., Los Angeles—by Board of Public Works, Los Angeles. 3-30

LOS ANGELES CO.—**Steve P. Rados,** 2975 San Fernando Rd., Los Angeles—$12,967 for construction of a storm drain and appurtenances in Argyle Ave., Los Angeles—by Board of Public Works, Los Angeles. 3-29

SAN FRANCISCO CO.—**Healy-Tibbitts Construction Co.,** 1100 Evans Ave., San Francisco—$174,892 for construction of Lincoln Way storm drain, Great Highway System—by Dept. of Public Works, San Francisco. 3-22

SAN FRANCISCO CO.—**M. J. Lynch,** Barneveld and Oakdale Ave., San Francisco—$7,187 for repair work on the sewer in California St., between Pierce and Steiner Sts., San Francisco—by Dept. of Public Works, San Francisco. 4-16

SAN MATEO CO.—**Peter Sorensen,** 927 Arguello St., Redwood City—$12,975 for construction of an outfall sewer to service property west of El Camino Real, South San Francisco—by City Council, South San Francisco. 4-18

SOLANO CO.—**Fogelberg-Ritchie Co.,** 1416 Benton St., Oakland—$9,888 for construction of an outfall sewer line at Rio Vista—by City Council, Rio Vista. 4-2

Texas

BEXAR CO.—**Dudley R. Cloud,** San Antonio—$21,938 to construct additional drainage facilities at San Antonio ASF Depot—by U. S. Engineer Office, San Antonio. 3-20

Utah

UTAH CO.—**T. W. McGraw Construction Co.,** Salt Lake City—$12,694 for the construction of sanitary sewer facilities at Orem—by City Council, Orem. 3-23

Washington

WHATCOM CO.—**C. V. Wilder,** Bellingham—$4,590 for improvement of Drainage District No. 23—by Whatcom County Commissioners. 3-14

Waterway . . .

California

ALAMEDA CO.—**Duncanson-Harrelson Co.,** 1404 De Young Bldg., San Francisco—$20,000 for repairing wharf at Oakland—by Pacific Drydock & Repair Co., Oakland. 3-30

ALAMEDA CO.—**Healy-Tibbitts Construction Co.,** 1100 Evans Ave., San Francisco—$26,660 for construction of barge mooring facilities at Oakland Port—by U. S. Engineer Office, San Francisco. 3-23

ALAMEDA CO.—**San Francisco Bridge Co.,** 503 Market St., San Francisco—$301,254 for dredging at Oakland Outer Harbor—by U. S. Engineer Office, San Francisco. 3-30

ALAMEDA CO.—**Basalt Rock Co., Inc.,** 900 8th St., Napa—$1,175,967 for the construction of a breakwater at the Naval Air Station, Alameda—by Bureau of Yards and Docks, Washington, D. C. 4-6

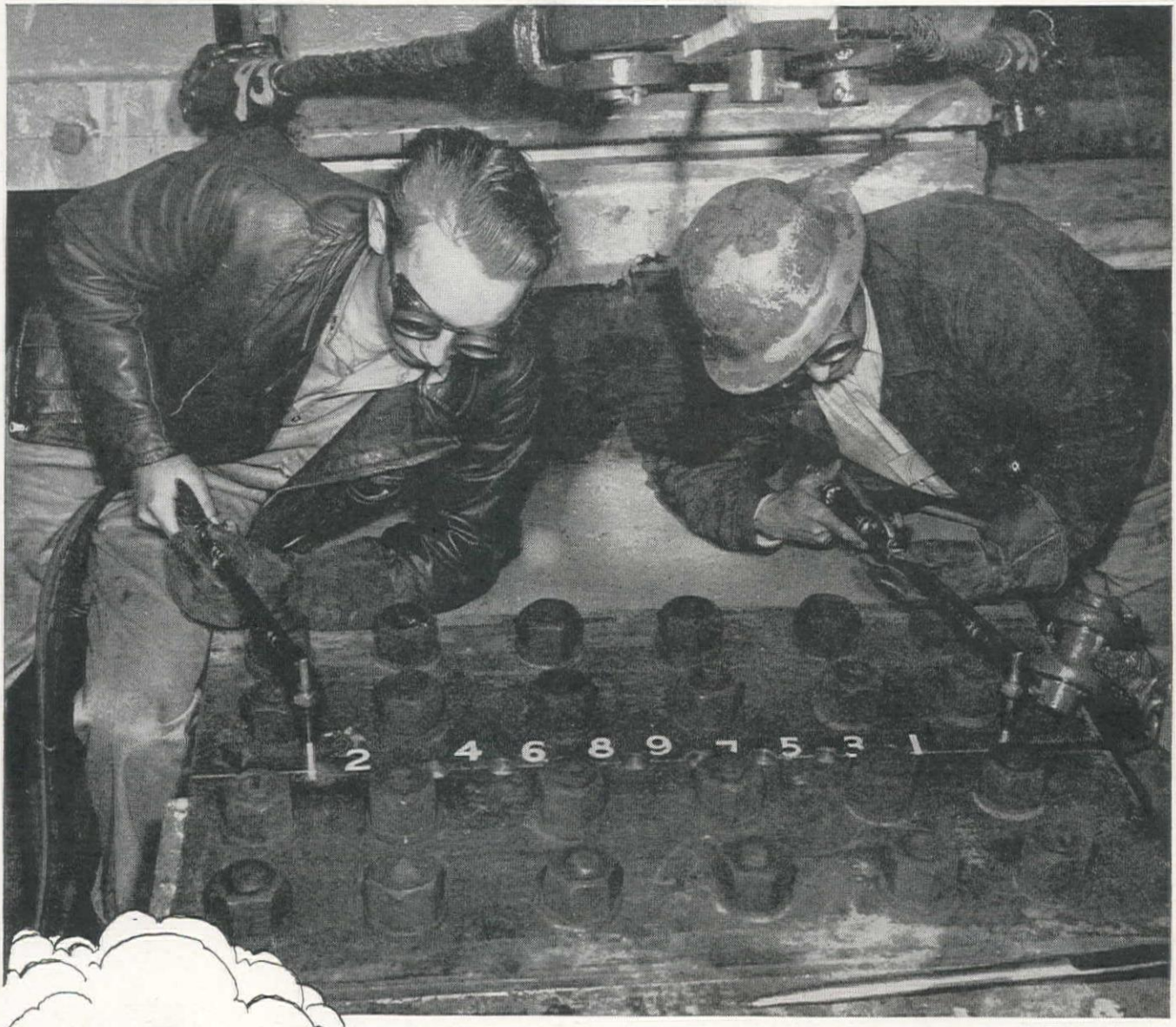
ALAMEDA CO.—**Olympian Dredging Co.,** 525 Market St., San Francisco—$33,948 for dredging at Oakland Outer Harbor—by U. S. Engineer Office, San Francisco. 4-18

LOS ANGELES CO.—**J. E. Haddock, Ltd.,** 3538 E. Foothill Blvd., Pasadena—for the construction of three floating drydocks at San Pedro—by Bureau of Yards and Docks, Washington, D. C. 3-16

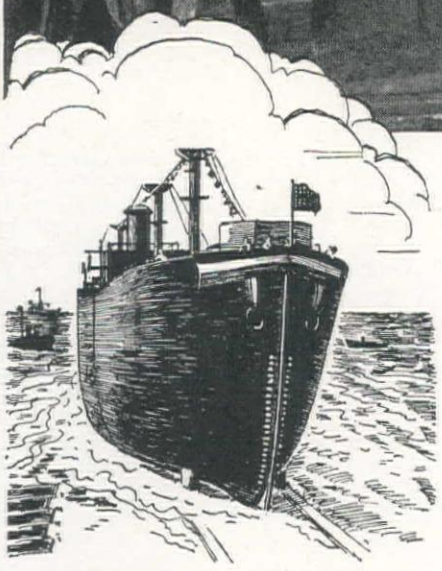
LOS ANGELES CO.—**Pugh Construction Co., Ltd.,** 1260 Alameda St., Wilmington—$100,000 for construction of a timber wharf at Wilmington. Wharf will have wood piling and will be 621 ft. long and 31½ ft. wide—by Consolidated Steel Corp., Shipbuilding Division, Wilmington. 3-20

LOS ANGELES CO.—**Pugh Construction Co., Ltd.,** 1260 Alameda St., Wilmington—$52,862 for the construction of docking facilities for small boats at the Small Craft Training Center, Terminal Island, San Pedro—by Bureau of Yards and Docks, Washington, D. C. 3-30

They launched a thousand ships



At the launching plate—photo courtesy Marinship Corporation, Sausalito, California



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AD 107

LOS ANGELES CO.—**Case Construction Co.**, P. O. Box 6, Berth 109 San Pedro—$18,750 for dredging approximately 15,000 cu. yd. of material from areas in front of wharves at the Inner Harbor, Los Angeles—by Los Angeles Harbor Dept. 4-4

Oregon

CLATSOP CO.—**Anderson & Hendrickson,** Astoria—for the construction of three marine ways, an oil dock, machine shop, warehouse and miscellaneous facilities in Skipanon Channel at Warrenton—by Port of Astoria. 3-15

CLATSOP CO.—**Gilpin Construction Co.,** 4850 NW. Front, Portland—$25,000 for the construction of two finger piers for a 15-boat mooring basin at Astoria, between 4th and 5th Sts., and excavating a basin to a low water depth of 10 ft. inshore to within 30 ft. of the S. P. & S. Railroad track—by Standard Oil Co., Astoria. 3-20

WASCO CO.—The U. S. Coast Guard is planning the construction of a 305-ft. pier on the Columbia River at The Dalles for the accommodation of cutters and additional storage space. 3-17

Washington

KING CO.—**The Manson Construction & Engineering Co.,** 821 Alaskan Way, Seattle—$28,000 for remodeling work on the pier and in the store quarters at 1111 Alaskan Way—by Northern Pacific Railway, Seattle. 3-28

SKAGIT CO.—**The Everett Pacific Shipbuilding & Drydock Co.,** Everett—$2,000,000 for the construction of two floating drydocks, with 1,900-ton lift capacity, at Everett—by Bureau of Yards and Docks, Washington, D. C. 3-23

Canada

BRITISH COLUMBIA—**Highway Construction Co., Ltd.,** 789 West Pender St., Vancouver—$45,000 for the construction of supporting towers for No. 3 grain jetty at the foot of Vernon Dr., Vancouver—by National Harbours Board, Ottawa, Can.

Dam . . .

Idaho

BOUNDARY CO.—**Lynch Brothers,** 3635 Woodland Park, Seattle—$16,780 for exploratory drilling at the Katka dam site Kootenai River—by U. S. Engineer Office, Seattle, Wash. 4-6

Irrigation . . .

California

STANISLAUS CO.—**P. E. Story & Son** Turlock—for lining the Olson-Turner ditch in Improvement District No. 354—by Turlock Irrigation District, Turlock. 4-12

New Mexico

QUAY CO.—**Hym Engineering Co.,** 268 13th St. E., Salt Lake City, Utah—$130,04 for furnishing labor aand materials for the construction of various structures for Bell Elliott, Roberts, State, Jack County, Liberty, Young, Coulter, Hurley and Ben lateral and sublaterals on the Tucumcar project near Tucumcari—by Bureau o Reclamation, Tucumcari. 4-

Oregon

DESCHUTES CO.—**United Construction Co.,** 1021 8th Ave. N., Seattle—$101,395 fo construction of earthwork and structures lateral M-37 and sublaterals, Deschute project—by U. S. Bureau of Reclamation Bend, Ore. 3-1

Washington

YAKIMA CO.—**N. Fiorito Company,** 110 Leary Way, Seattle—$196,075 for the con struction of earthwork and structure Yakima Ridge Canal, Station 4712 plu 96.74 to Station 5288 plus 95.5 and Waste ways 6 and 7, Roza Division, Yakim Project, northeast of Prosser—by Burea of Reclamation, Denver, Colo. 3-3

Building . . .

Arizona

MARICOPA CO.—**James B. Donaldso Construction Co.,** Phoenix—$100,000 f construction of a 40-bed contagious di ease ward at St. Monica's Hospital, Pho nix—by Federal Works Agency, Washin ton, D. C. 3-1

Construction Plant and Equipment From Shasta Dam, California

Available For Sale **Immediate Delivery**

Listed below are a few of the items of plant and equipment used in the construction of this dam. Most of the equipment purchased new for this project. All items available for immediate shipment, F.O.B. Shasta Dam, California, subject to prior sale.

CABLEWAYS AND HOISTS

3—Lidgerwood, 3-drum electric hoists with 500 H.P. G.E. Motors. Ward Leonard control, complete with controls and all electric equipment.

3—Lidgerwood, 3-drum electric hoists with 500 H.P. Westinghouse motors complete with controls and all electrical apparatus.

5—Cableway towers, structural steel, 3—125 ft.; 1—75 ft. and 1—45 ft., complete with travel mechanism.

6—Complete sets of carriages, main and auxiliary, fall and dump blocks, fall rope carriers, buttons, takeup bars and takeup sheaves.

1—American pillar crane. Cap. 5 T. at 48½ ft. and 15 T. at 25 ft. radius.

1—Colby elevator hoist, double drum, 75 H.P., equipped with brakes and emergency equipment including one hoist cage. 15 ton capacity.

1—1790 ft. pcs. of 3" dia. locked coil cable, new.

12,000 lin. ft. of used 3" dia. locked coil cable in length from 500 to 2600 lin. ft.

50,000 lin. ft. of used ⅞" and 1⅛" wire rope.

20,000 lin. ft. of new ⅞" and 1⅛" wire rope.

Misc. lot of sheaves, jewels, blocks, etc.

CEMENT PLANT

1—Dual #265 Fuller Fluxo cement pump, duplex type complete with gravity feed and automatic control equipment. 400 bbls. per hr. capacity. Pumping distance 3300 ft.

2—Fuller-Kinyon Pumps—type "D" 125 h.p. complete with air hose power control cable, control cabinets.

1—C-200 Fuller single stage rotary compressor Westinghouse motor 100 h.p.

CONVEYORS

500 troughing rolls for 36" belt.

150 return idlers for 36" belt.

2—Complete sets, including 42" tandem drive pulleys, 42" head pulleys, 36" tail pulleys.

3—150 h.p. Westinghouse gear motors, 144 r.p.m., 2300 volts, 3-phase, 60 cycle.

2—75 h.p. Westinghouse gear motor, 194 r.p.m., 2300 volt, 60-cycle.

1—Telepoise conveyor scale for 36" belt.

1—Airplane tripper for 36" belt with two 17' wing belts, capacity 1,000 T per hour, complete with pulleys, drives and gear motors.

16—White dump trucks model 1580-691, 24 cu. yd. capacity in good condition.

DRILLING EQUIPMENT

5—I-R paving breakers.

8—I-R drifters DA35.

4—I-R Wagondrills—pneu. tires, hoists, X71 drifters mounted.

1—I-R-54 Drill Sharpener.

10—I-R Jackhammers.

TANKS & RECEIVERS

1—9500 bbl. all welded water tank, 48' dia., 30' high.

1—5400 bbl. all welded water tank, 36' dia., 30' high.

1—200 bbl. steel water tank.

10—Sandblast tanks 24" x 96" with hoppers and fittings.

10—Lubricator tanks 14" x 30"; 24" x 48"; and 24" x 60".

PUMPS

2—Byron-Jackson 400 h.p. 12 in. deepwell.

3—Bingham type SVD submersible pumps.

1—Byron-Jackson 150 h.p. 10 in. deepwell.

1—Gardner-Denver grout pump model FD-FS, 10" x 2½" x 10", with case-hardened liners and Calmex pistons and rods, 1,000 lb. pressure at 90 lb. air.

Other pumps complete with motors from 1½ h.p. to 200 h.p., also several I-R #25 sump pumps.

MIXING PLANTS

1—3000 cy. bin with 5 compartments for aggregates, 2 compartments cement, incl. turnhead, gates.

1—Complete set C. S. Johnson fully automatic batching equipment for 5 aggregates, cement and water for 4 cy. batchers.

5—4 cy. Koehring Concentric zone mixers, incl. batchmeters, timers, consistency meters.

1—100-ton steel bin.

MISCELLANEOUS

4 ea. #6671 Mattison mine cars, body size 29" x 47" x 32".

1—Robbins Contractor Screen 16" x 36".

1—Bodinson 60" x 16' trommel screen complete with motor drive, feed chutes.

Valves—1, 2, 3, 4, 6, 8, 10, 12, 16-inch.

10,000 ft. Type S rubber covered cable.

Pole line hardware.

Floodlites—500 to 1500 w.

1—LeTourneau Heavy Duty 3-Point Rooter.

1—1¼ cu. yd. Heavy Duty Clamshell Bucket.

12—Muck Skips, 7—14 cu. yds.

50—Chicago Pneumatic concrete vibrators, Nos. 417, 518 and 519.

MACHINERY AND SUPPLIES

1—125 KW. motor generator set, 275 volts DC.

1—Sand drier, 24" dia. x 10' long, with motor, speed reducer, feed & discharge chutes, oil burner & stacks.

5—Blowers; American and Buffalo.

Complete stock of Warehouse supplies.

Complete line of transformers and electric motors.

PACIFIC CONSTRUCTORS, INC.

GENERAL CONTRACTORS — SHASTA DAM, CALIFORNIA **PHONE 512 REDDING**

MARICOPA CO.—**W. A. Beaubien,** 2331 E. Osborn Rd., Phoenix—$41,045 for the construction of a six-classroom addition to the Isaac school building, for the Maricopa School District No. 5, near Phoenix. Structure to be of brick construction—by Federal Works Agency, Washington, D. C. 3-26

MARICOPA CO.—**Del E. Webb Construction Co.,** Box 4066, Phoenix—$50,000 for the construction of 15 additional cottage units at 1520 West Van Buren St., Phoenix—by Palomine Auto Court, Phoenix. 3-30

MARICOPA CO.—**Del E. Webb Construction Co.,** Box 4066, Phoenix—$82,955 for the construction of a dairy building at the northwest corner of 19th and Glendale Ave., Phoenix. Bldg. to be 118x206 ft. in area, of brick construction—by Architects Byron & Laraway, Phoenix. 3-30

PIMA CO.—**F. B. Pacheco,** P. O. Box 708, Tucson—$57,043 for the construction of an elementary school in the El Rio Park Addition, Tucson—by School District No. 1, Tucson. 3-16

California

ALAMEDA CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$90,000 for construction of reinforced concrete tire factory addition at Oakland—by Pacific Rubber & Tire Mfg. Co., Oakland. 4-2

ALAMEDA CO.—**Dinwiddie Construction Co.,** 210 Crocker Bldg., San Francisco—$115,000 for the construction of a passenger terminal and 200-seat chapel at the Auxiliary Air Station, Oakland—by Bureau of Yards and Docks, Washington, D. C. 3-29

ALAMEDA CO.—**Equity Contracting Co.,** 411 Webster St., Oakland—$184,806 for construction of 72 family units in Oakland and Alameda—by Federal Public Housing Authority, San Francisco. 3-26

ALAMEDA CO.—**M. A. Little,** 1 Grand View Ave., San Francisco—$115,500 for constructing 56 temporary dwelling units in Berkeley—by Federal Public Housing Authority, San Francisco. 4-18

ALAMEDA CO.—**Willis F. Lynn,** 3848 Grand Ave., Oakland—$475,900 for the construction of an addition to Berkeley General Hospital, Berkeley—by Berkeley General Hospital. 3-16

ALAMEDA CO.—**Monson Brothers,** 475 6th St., San Francisco—$66,900 for the construction of a gymnasium and recreational facilities at the U. S. Naval Hospital, Oak Knoll, Oakland—by Bureau of Yards and Docks, Washington, D. C. 4-3

ALAMEDA CO.—**Valley & Lincoln,** 10221 E. 14th St., Oakland—$135,000 for the construction of seven two-story apartment buildings, with garages, in the 100 block on Haas Ave., San Leandro—by self. 3-23

CONTRA COSTA CO.—**S. J. Amoroso Construction Co.,** 2136 Alemany Blvd., San Francisco—$74,700 for the construction of two community buildings at Richmond—by Housing Authority of the City of Richmond. 4-11

CONTRA COSTA CO.—**H. H. Larson Co.,** 64 South Park, San Francisco—for the construction of a one-story steel frame utility building, in connection with basin deepening, for naval repair facilities at Richmond Shipyard No. 3—by H. J. Kaiser Co., Richmond.

CONTRA COSTA CO.—**Willis F. Lynn,** 3848 Grand Ave., Oakland—$94,250 for playground equipment, incinerators and street signs at Richmond—by Housing Authority of the City of Richmond. 4-16

CONTRA COSTA CO.—**MacDonald & Kahn, Inc.,** 200 Financial Center Bldg., San Francisco—$379,200 for the construction of a dispensary building at the Inland Storage Area, Port Chicago—by Bureau of Yards & Docks, Washington, D. C. 3-16

KERN CO.—**Struction,** 8442 Santa Monica Blvd., Los Angeles—$113,987 for the construction of 40 war dwelling units at Mojave—by Federal Public Housing Authority, San Francisco. 4-11

LOS ANGELES CO.—**H. W. Baum & Co.,** 1816 Doras Court, Burbank—$234,300 for construction of a tooling warehouse at Burbank—by Lockheed Aircraft Corp., Burbank. 4-2

LOS ANGELES CO.—**Buttress & McClellan,** 1013 E. 8th St., Los Angeles—$300,000 for the construction of a new factory building in South Gate. Building to be steel frame construction with corrugated iron exterior and roof—by Defense Plant Corp., Los Angeles. 3-30

LOS ANGELES CO.—**R. J. Daum,** 6803 West Blvd., Inglewood—$127,874 for the construction of additional facilities at the Disciplinary Barracks, Terminal Island, San Pedro—by Bureau of Yards and Docks, Washington, D. C. 3-23

LOS ANGELES CO.—**William O. Gray** 10911 Atlantic Blvd., Lynwood—$50,000 for the construction of a market building at Venice—by Daylite Markets, Inc., Los Angeles. 3-16

LOS ANGELES CO.—**John Keith,** 397 Wilshire Blvd., Los Angeles—$138,448 to

construct a school building at the John Muir School site on Delta Ave., Long Beach—by Long Beach Board of Education, Long Beach. 4-17

LOS ANGELES CO.—**Modern Builders Construction Co.,** 2812 Long Beach Blvd., Long Beach—$396,781 for the construction of the new Wm. Logan Stephen junior high school at Santa Fe Ave. and Cowles St., Long Beach—by Long Beach Board of Education, Long Beach. 4-16

LOS ANGELES CO.—**Harvey A. Nichols,** 936 E. Slauson Ave., Los Angeles—$60,000 for the construction of a reinforced concrete warehouse building at 6823 Romaine St., Hollywood—by Bekins Van & Storage Co., Los Angeles. 3-30

LOS ANGELES CO.—**J. O. Oltmans & Son,** 810 E. 18th St., Los Angeles—$50,600 for the construction of ten buildings in Azusa, of reinforced concrete and frame construction—by Aerojet Engineering Co., Pasadena. 3-30

LOS ANGELES CO.—**Roscoe & Land,** 468 I. W. Hellman Bldg., Los Angeles, and Marvin B. Parker, 641 S. Berendo St., Los Angeles—for the construction of an elementary school at Lawndale—Federal Works Agency, Washington, D. C. 3-29

LOS ANGELES CO.—**Schoenberger Brothers,** 1640 Obispo Ave., Long Beach—$121,333 for the construction of the new Eugene Field School, at Long Beach—by Long Beach Board of Education, Long Beach. 4-17

LOS ANGELES CO.—**George B. Thatcher,** 4074 Laurel Canyon Blvd., North Hollywood—$102,840 for constructing 40 war dwelling units at San Pedro—by Federal Public Housing Authority, San Francisco. 4-5

LOS ANGELES CO.—**Del E. Webb Construction Company,** 1105-14 Continental Bldg., Los Angeles—for interior alterations to a 7-story office and factory building on E. 7th St., Los Angeles—by Bishop & Co., Inc., Los Angeles. 3-29

LOS ANGELES CO.—**Webber and Company,** 606 S. Hill St., Los Angeles—$350,000 for construction of an extension to factory building in Vernon. Structure will cover an area 150x760 ft. and will have reinforced brick walls, concrete floor, steel columns and trusses, steel sash, wood roof sheathing, composition covered roof—by Norris Stamping Co., Vernon. 3-30

LOS ANGELES CO.—**Zoss Construction Co.,** 1037 N. Cole Ave., Los Angeles—$83,073 for additional work for the expansion program at Birmingham General Hospital, Van Nuys—by U. S. Engineer Office, Los Angeles. 3-30

ORANGE CO.—**Lewis W. Hunt Co.,** 854 S. Robertson Blvd., Los Angeles, and **Roscoe & Land,** 468 I. W. Hellman Bldg., Los Angeles—$599,468 for construction of 43 buildings, containing 280 war dwelling units, at El Toro—by Federal Public Housing Authority, Los Angeles. 4-3

ORANGE CO.—**W. C. Smith, Inc.,** 411 W. 5th St., Los Angeles—$81,800 for construction of a vacuum dust removal and cleaning system building, a depth charge testing, Mark 8, and a boiler house at the Naval Ammunition and Net Depot, Seal Beach—by Bureau of Yards and Docks, Washington, D. C. 4-11

RIVERSIDE CO.—**W. J. Hunter,** 660 Heliotrope Dr., Los Angeles—$69,144 for the construction of WAC barracks, recreation building and extension to existing lavatory building at Torney General Hospital, Palm Springs—by U. S. Engineer Office, Los Angeles. 3-16

RIVERSIDE CO.—**J. K. Thomas & Beyer Construction Co.,** 611 Chamber of Commerce Bldg., Los Angeles—$356,709 for construction of a welfare rehabilitation, recreation and ship service building at the Naval Hospital, Corona—by Bureau of Yards and Docks, Washington, D. C. 4-18

SAN BERNARDINO CO.—**Imhoff & Associates,** 1748 New Ave., San Gabriel—$120,000 for construction of 44 war housing dwelling units at Barstow—by Federal Public Housing Authority, Los Angeles. 4-18

SAN BERNARDINO CO.—**Steed Bros.,** 714 Date Ave., Alhambra—$148,994 for the construction of a hangar at Victorville AAF, Victorville—by U. S. Engineer Office, Los Angeles. 4-3

SAN BERNARDINO CO.—**Wesco Construction Co.,** 2000 Hyperion Ave., and **Drycemble Houses, Inc.,** 5335 Southern Ave., South Gate—$136,594 for the preparation of the site and the furnishing, fabrication and erection of 65 portable shelter units at Barstow—by Federal Public Housing Authority, San Francisco. 3-29

SAN DIEGO CO.—**Baruch Corporation,** 625 South Olive St., Los Angeles—$114,923 for constructing 40 war dwelling units at Fallbrook—by Federal Public Housing Authority, Los Angeles. 4-11

SAN DIEGO CO.—**O. L. Carpenter,** 353 Spreckels Theater Bldg., San Diego—$52,285 for the construction of Building No. 6

at the U. S. Naval Radio and Sound Laboratory, Point Loma—by U. S. Navy Public Works Office, San Diego. 3-16

SAN DIEGO CO. — **Dentzel & Whyte,** 825 S. Date Ave., Alhambra—$121,000 for construction of 44 war dwelling units at San Diego — by Federal Public Housing Authority, San Francisco. 4-10

SAN DIEGO CO.—**M. H. Golden,** 3485 Noell, San Diego—$3,219,470 for the construction of additional storehouses at the Naval Air Station, Spanish Bight, San Diego—by Bureau of Yards and Docks, Washington, D. C. 3-30

SAN DIEGO CO. — **Haddock-Engineers, Ltd.,** 605 W. 6th St., Los Angeles—$171,-687 for the construction of a reclamation salvage building at Camp Pendleton, Oceanside—by Bureau of Yards and Docks, Washington, D. C. 4-18

SAN DIEGO CO. — **Harvey & Rose,** 211 W. Orange Grove, Arcadia—$106,000 for construction of 40 family war dwelling units at San Diego — by Federal Public Housing Authority, San Francisco. 4-10

SAN DIEGO CO.—**Scherer & Prichard,** 3964 Orange St., Riverside — $80,759 for the construction of additional women's barracks at the Marine Corps Air Depot, Miramar — by Bureau of Yards and Docks, Washington, D. C. 3-30

SAN DIEGO CO.—**Scherer & Prichard,** 3964 Orange St., Riverside—$265,649 for the construction of a two-story, 25-room addition to the Dana junior high school, Point Loma. The building will be of reinforced concrete, 223 x 100 ft. in area—by San Diego Board of Education, San Diego. 3-6

SAN DIEGO CO.—**Shumaker & Evans Construction Co.,** and **P. W. Womack,** 4007 W. 6th St., Los Angeles—$462,249 for the construction of 200 Navy dwelling units in Oceanside — by Federal Public Housing Authority, San Francisco. 4-12

SAN DIEGO CO. — **Del E. Webb Construction Co.,** 1105 Continental Bldg., Los Angeles—$600,000 to convert facilities at Mitchell Convalescent Hospital, Camp Lockett, Calif.—by U. S. Engineer Office, Los Angeles. 3-30

SAN FRANCISCO CO.—**Austin Co.,** 618 Grand Ave., Oakland — $90,000 for construction of a one-story and mezzanine packing plant at Third St. and Islais Creek Channel, San Francisco—by F. E. Booth, Inc., San Francisco. 3-30

SAN FRANCISCO CO.—**Freethy-Kimball Co.,** Kohl Bldg., San Francisco—$47,-996 for construction of fire house and locomotive shed at the Marine Corps Depot of Supplies, Islais Creek, San Francisco—by Bureau of Yards and Docks, Washington, D. C. 4-11

SAN FRANCISCO CO.—**M. J. King, Inc.,** 231 Franklin St., San Francisco—$128,878 for the construction of a two-story office building in the rear of the Public Library, McAllister and Hyde Sts., San Francisco —by Bureau of Yards and Docks, Washington, D. C. 4-5

SAN FRANCISCO CO. — **Robert McCarthy Co.,** 1050 Kirkham St., San Francisco—$245,502 for the construction of a gymnasium and swimming pool with utilities at Letterman General Hospial, Presidio of San Francisco—by U. S. Engineer Office, San Francisco. 4-3

SAN FRANCISCO CO.—**Monson Bros.,** 475 6th St., San Francisco—$55,250 for the construction of WAC housing at Letterman General Hospital, Presidio of San Francisco—by U. S. Engineer Office, San Francisco. 3-20

SAN FRANCISCO CO.—**C. F. Parker,** 1644 Monterey Blvd., San Francisco—$47,-298 for completion of center wing of NOFT Administration Bldg., San Francisco—by Bureau of Yards and Docks, Washington, D. C. 4-6

SAN FRANCISCO CO.—**J. H. Pomeroy & Co.,** 333 Montgomery St., San Francisco —$146,428 for construction of quarters for enlisted and officer personnel at the U. S. Receiving Hospital, San Francisco — by Bureau of Yards and Docks, Washington, D. C. 4-12

SAN JOAQUIN CO.—**W. A. Bechtel Co.,** 155 Sansome St., San Francisco—for the construction of a brick, concrete and steel food processing and canning factory at Tracy—by H. J. Heinz Co., Pittsburgh, Pa. 3-23

SAN JOAQUIN CO. — **MacDonald and Kahn, Inc.,** 200 Financial Center Bldg., San Francisco—$101,679 for construction of 36 temporary family dwelling units at Stockton—by Federal Public Housing Authority, San Francisco. 4-18

SAN MATEO CO.—**The Louis C. Dunn Co.,** 681 Market St., San Francisco—$83,-564 to construct housing for medical detachment at Dibble General Hospital, Menlo Park—by U. S. Engineer Office, San Francisco. 3-20

SAN MATEO CO. — **Wells P. Goodenough,** 49 Wells Ave., Palo Alto—$75,956 to construct WAC housing at Dibble General Hospital, Menlo Park—by U. S. Engineer Office, San Francisco. 3-20

SAN MATEO CO.—**Pacific Homes, Inc.,** 859 San Mateo Dr., San Mateo—$168,000 for the construction of 42 one-story family dwellings at El Camino Real and Middle Ave., Menlo Park—by self. 3-23

SAN MATEO CO. — **The Schultz Construction Co.,** 1 Hillcrest Blvd., Millbrae —for the construction of 200 dwelling units at the Bayside Manor Tract, between El Camino Real and Bayshore Highway, north of Millbrae Ave., Millbrae—by self.

SAN MATEO CO. — **Stoneson Brothers,** 1 Sloat Blvd., San Francisco — $1,123,200 for the construction of 208 residences to be known as Edgewood Terrace, at Daly City—by self.

SANTA CLARA CO.—**Austin Company,** 1001 Ray Bldg., Oakland—$60,000 for the construction of a reinforced concrete warehouse, 160 x 258 ft., at Rosa and Mission Sts., San Jose—by Continental Can Co., San Jose. 3-16

SANTA CLARA CO.—**Carl N. Swenson Co.,** 355 Stockton Ave., San Jose—$67,800 for construction of an addition of two wings to laboratory building at Moffett Field—by NACA, Moffett Field. 4-2

SOLANO CO.—**H. H. Larsen Co.,** 64 South Park, San Francisco—$50,102 for construction of a paint shop and boiler house at Benicia Arsenal—by U. S. Engineer Office, San Francisco. 4-6

SOLANO CO.—**George M. Robinson & Co.,** 451 Folsom St., San Francisco—$64,-604 for sprinkler installations at Benicia Arsenal—by U. S. Engineer Office, San Francisco. 3-21

SOLANO CO. — **Stolte, Inc.,** 8451 San Leandro St., Oakland — $143,514 to construct a reclamation building at Benicia Arsenal—by U. S. Engineer Office, San Francisco. 4-18

SUTTER CO.—**McCoy & Butler,** 1128 F St., Marysville — $68,645 to construct a wood frame and stucco school building at Live Oak — by Live Oak Union High School District. 4-5

Colorado

LARIMER CO.—**Harry G. Worsham,** 101 Lipan St., Denver—$68,150 for construction of additions to the county hospital at Fort Collins—by Larimer County Board of Commissioners, Fort Collins. 3-22

Nebraska

ADAMS CO.—**Maxon Construction Co., Inc.,** 131 N. Ludlow Ave., Cincinnati, Ohio —$6,291,000 for expansion of existing naval ammunition depot at Hastings — by Bureau of Yards and Docks, Washington, D. C. 3-30

HALL CO.—**Greer-Maurer Construction Co.,** Grand Island, Neb.—$154,242 for the construction of dormitories and a boiler house at the Cornhusker Ordnance Plant, Grand Island—by U. S. Engineer Office, Denver, Colo. 3-20

Nevada

CHURCHILL CO. — **Dinwiddie Construction Co., Inc.,** Crocker Bldg., San Francisco — $227,700 for construction of homoja housing at the Auxiliary Air Station, Fallon—by Public Works Office, San Francisco. 4-5

CLARK CO.—**General Construction Co.** and **J. Walter Johnson,** 5205 Hollywood Blvd., Los Angeles—$47,242 for the construction of upper turret mock-ups, lower phase mock-ups and blister siding station mock-ups at the Las Vegas Army Airfield, Las Vegas—by U. S. Engineer Office, Las Vegas. 3-16

MINERAL CO. — **William P. Neil Co., Ltd.,** 4814 Loma Vista Ave., Los Angeles—$311,961 for construction of additional personnel and office facilities, Naval Ammunition Depot, Hawthorne — by Bureau of Yards and Docks, Washington, D. C. 4-5

New Mexico

LEA CO.—**Panhandle Carbon Co., Inc.,** New York, N. Y.—$2,000,000 to provide additional plant facilities at Eunice — by Defense Plant Corp., Washington, D. C. 2-19

Oklahoma

TEXAS CO.—**Stone & Webster Co.,** 49 Federal St., Boston, Mass.—$3,000,000 for the construction of additional plant facilities at Guymon—by Defense Plant Corp., Washington, D. C. 4-5

Oregon

CLACKAMAS CO.—**Morrison-Knudsen Co., Inc.,** Hoge Bldg., Seattle — $100,000 for repairs at the Portland General Electric Co. power plant at Estacada. Work includes relining and repairing surge tanks and tunnels with concrete and steel plates —by Portland General Electric Co. 3-19

CLATSOP CO.—**Hendrickson & Anderson,** Astoria—$100,000 for construction of a cold storage plant at Flavel—by Del Mar Packing Co., Monterey, Calif. 3-28

DOUGLAS CO.—**Todd Bldg. Co.,** Roseburg—$149,746 for the construction of a homoja housing project at the Naval Air Station, Klamath Falls — by Bureau of Yards and Docks, Washington, D. C. 3-22

HOOD RIVER CO.—**Baldwin & Wheir,** Hood River—for the construction of a fruit packing plant at Hood River. Work involves construction of a building 88 x 200 ft. in area and a second floor 44 x 200 ft. in area, tile or concrete exteriors and wood frame roof—by Duckwall Bros., Inc., Hood River. 3-22

KLAMATH CO. — **Halvorson Construction Co.,** Salem—$393,686 for the construction of 155 family dwelling units at Klamath Falls—by Federal Public Housing Authority, Portland. 4-3

KLAMATH CO. — **K. T. Henderson,** Klamath Falls—for the construction of 50 prefabricated dwelling units for occupancy by civilian war workers in Klamath Falls —by Federal Public Housing Authority. 4-5

KLAMATH CO. — **Todd Building Co.,** P. O. Box 27, Roseburg—$149,746 for assembling and erecting 33 homoja huts at Klamath Falls, including construction of parking areas, grading, culverts, roads, sewer, water system, etc.—by Bureau of Yards and Docks, Washington, D. C. 3-29

LANE CO.—**K. T. Henderson,** Longview, Wash.—$116,700 for the construction of 50 prefabricated family dwelling units at Eugene — by Federal Public Housing Authority, Eugene. 4-4

UMATILLA CO.—**Sound Construction & Engineering Co.,** 1403 W. 45th St., Seattle —$55,000 for the construction of a warehouse at Freewater—by American Can Co., Portland. 4-16

UMATILLA CO.—**Halvorson Construction Co.,** 608 First National Bank Bldg., Salem—$47,403 to construct an addition to the cooperative fruit packing and cold storage plant at Milton—by The Blue Mountain Prune Growers Cooperative, Milton. 4-11

WASCO CO. — **Henry George & Sons,** Hutton Bldg., Spokane, Wash., and **Mid-State Construction Co.,** The Dalles—$96,-813 to construct a grain elevator annex at The Dalles, Ore.—by Port of The Dalles Commission, The Dalles. 3-30

Texas

BEXAR CO. — **J. W. Bateson,** Irwin-Keasler Bldg., Dallas — $443,980 for the construction of hangars at Randolph Field —by U. S. Engineer Office, San Antonio. 4-3

CAMERON CO.—**Gerald Mora,** 312 Sabine St., Houston—$63,000 for construction of 300 family trailers, with utilities, at Harlingen — by Federal Public Housing Authority, Fort Worth. 4-3

CARSON CO. — **McCann Construction Co.,** 300 S. Main St., Fort Worth—$497,346 for constructing war housing units adjacent to and on the Pantex Ordnance Plant site about 14 mi. north and east of Amarillo — by Federal Public Housing Authority, Fort Worth. 3-22

DALLAS CO.—**Cowdin Brothers,** 411 S. Haskell St., Dallas—$57,000 for construction of an educational building at 2603 Idaho St., Dallas, to be 102 x 44 ft., of brick and reinforced concrete, and to remodel present building — by Hillcrest Baptist Church, Dallas. 3-26

HUNT CO. — **W. R. McKinney,** Greenville—$65,000 for the construction of a 164 x 154 brick and tile, one-story clinic building at Greenville—by Dr. William P. Phillips, Greenville. 3-15

HUTCHINSON CO. — **Bechtel-McCone Co.,** 601 W 5th St., Los Angeles—$6,600,-000 for the construction of a toluene manufacturing plant, to be located near Borger —by Defense Plant Corp., Washington, D. C. 4-6

NEUCES CO.—**R. P. Farnsworth & Co., Inc.,** 506 Bankers Mortgage Bldg., Houston —$58,433 for constructing an addition to nurses' quarters and Building H-9, and covered passageways at the U. S. Naval Hospital, Naval Air Station, Corpus Christi —by Bureau of Yards and Docks, Washington, D. C. 3-23

POTTER CO. — **McCann Construction Co.,** Box 2097, Fort Worth—$497,346 for construction of 500 temporary family dwelling units in Amarillo — by Federal Public Housing Authority, Fort Worth. 3-19

Utah

CARBON CO. — **Mark B. Garff,** 2256 Oneida St., Salt Lake City—$250,000 for rehabilitation of 76 cottages and miscellaneous improvements to other buildings at Helper—by Denver & Rio Grande Western Railroad Co., Denver, Colo. 4-4

WEBBER CO.—**R. J. Daum Construc-**

tion Co., 6803 West Blvd., Inglewood, Calif. —$50,285 for the construction of additions to buildings at Ogden Arsenal, near Ogden—by U. S. Engineer Office, Sacramento, Calif. 3-20

Washington

CLALLAM CO.—**Chisholm & Eiford,** Box 54, Bellingham—$58,188 for construction of 20 apartment units at Forks—by Federal Public Housing Authority, Seattle. 3-26

CLARK CO.—**Waale-Camplan Co.,** 2100 SW Jefferson, Portland, Ore.—$116,995 to construct additional WAC housing and convert existing buildings to wards at Barnes General Hospital, Vancouver—by U. S. Engineer Office, Portland, Ore. 3-20

CLARK CO.—**Waale-Camplan Co.,** 2100 SW Jefferson, Portland, Ore.—$42,833 for expansion of facilities at Barnes Hospital, Vancouver — by U. S. Engineer Office, Portland. 4-2

FRANKLIN CO.—**J. C. Boespflug Construction Co.,** Securities Bldg., Seattle—$120,943 for the construction of homoja huts for Navy personnel at Sand Point Naval Air Station, Seattle—by Bureau of Yards and Docks, Washington, D. C. 3-16

ISLAND CO.—**S. S. Mullen,** 9th and Roy Sts., Seattle—$175,523 for the construction of 65 family dwelling units at Whidby Island—by Federal Public Housing Authority, Seattle. 3-30

ISLAND CO.—**S. S. Mullen,** 621 9th Ave. N., Seattle — $128,933 for construction of a 28-bed dispensary and ambulance garage at the Naval Air Station, Whidby Island—by Bureau of Yards and Docks, Washington, D. C. 4-5

KING CO.—**Nelse Mortensen & Co.,** 1021 Westlake Ave. N., Seattle — $638,055 for construction of a hospital unit and accessories at the Naval Hospital in Seattle—by Bureau of Yards and Docks, Washington, D. C. 3-26

KING CO.—**Nelse Mortensen & Co.,** 1021 Westlake Ave. N., Seattle—$598,627 for the construction of 256 family units at Seattle — by Federal Public Housing Authority, Seattle. 3-26

KING CO.—**A. F. Mowat & John H. Sellen,** 2833 Eastlake, Seattle—$666,723 for the construction of warehouse facilities at Boeing plant, Renton—by U. S. Engineer Office, Seattle. 4-6

KING CO. — **Rainier Construction Co.,** American Bldg., Seattle—$110,792 for constructing camp facilities for Italian service units at Army Service Forces Depot, Seattle—by U. S. Engineer Office, Seattle. 4-12

KING CO.—**Strand and Sons,** 3939 University Way, Seattle—$304,600 for the construction of 432 single person dwelling units at Renton—by Federal Public Housing Authority, Seattle. 3-16

KING CO.—**Strand and Sons,** 3939 University Way, Seattle—$822,500 for construction of 315 dwelling units at Sand Point—by Federal Public Housing Authority, Seattle. 3-30

KING CO.—**Wick and Dahlgren,** 2016 30th Ave. S., Seattle — $360,000 to move 864 dormitories from Vancouver to Seattle and convert them into 144 family units — by Federal Public Housing Authority, Seattle. 3-26

KING CO.—**Wick and Dahlgren,** 2016 30th Ave. S., Seattle—$52,706 to construct 108 dormitories at Seattle—by Federal Public Housing Authority, Seattle. 3-26

KITSAP CO.—**Automatic Electric Sales Corp.,** 1033 W. Van Buren St., Chicago, Ill.—$54,919 to install additional telephone facilities at the Puget Sound Navy Yard, Bremerton — by Public Works Officer, Puget Sound Navy Yard, Bremerton. 3-27

KITSAP CO.—**Nettleton & Baldwin,** 1109 N. 36th St., Seattle—$377,400 for the construction of 576 temporary dormitory units adjacent to existing dormitories at Roosevelt Field, Bremerton—by Federal Public Housing Authority, Seattle. 3-23

MASON CO.—**Max W. Dudley,** Eugene Hotel, Eugene, Ore.—$65,615 for construction of 20 family dwelling units for naval personnel at Shelton—by Federal Public Housing Authority, Seattle. 3-28

PIERCE CO.—**Sam Bergesen,** P. O. Box 428, Tacoma—$115,443 for the construction of WAC housing at Madigan General Hospital, Fort Lewis—by U. S. Engineer Office, Seattle. 3-20

PIERCE CO.—**C. F. Davidson,** Tacoma —$52,291 for the construction of a gymnasium at Madigan General Hospital, Fort Lewis—by U. S. Engineer Office, Seattle. 3-21

PIERCE CO.—**H. R. Olsen,** 4040 Pacific Ave., Tacoma—$144,580 for the masonry construction of 192 dormitory units on Market St. in Tacoma—by Federal Public Housing Authority, Seattle. 3-15

PIERCE CO.—**Rainier Construction Co.,** American Building, Seattle—$161,977 for the construction of 216 dormitories at

Tacoma—by Federal Public Housing Authority, Seattle. 3-26

PIERCE CO.—**George Warter,** 7829 Pacific Ave., Tacoma—$128,000 to construct a nurses' home at the Western State Hospital, Fort Steilacoom. Building will be of frame and masonry construction—by Department of Finance, Olympia, Wash. 3-23

SKAGIT CO.—**S. S. Mullen,** 621 9th Ave. N., Seattle—$175,523 for construction of 65 family dwelling units at Anacortes-Whidby Island for naval personnel—by Federal Public Housing Authority, Seattle. 4-4

SPOKANE CO.—**Roy L. Bair Company,** 1220 Ide Ave., Spokane—$125,000 for construction of a two-story concrete, brick and tile building on Garland Ave., Spokane, to house a theater, stores and living quarters.

SPOKANE CO.—**Hazen & Clark,** Welsch Bldg., Spokane—$41,914 to construct WAC housing at Baxter General Hospital, Spokane—by U. S. Engineer Office, Seattle. 3-20

THURSTON CO.—**Max Dudley,** Eugene, Ore.—$58,900 for the construction of 20 two-story dwelling units at Shelton—by Federal Public Housing Authority, Seattle. 3-30

WALLA WALLA CO.—**A. Ritchie & Co.,** Box 253, Walla Walla—$211,953 to construct additional WAC and Medical Detachment housing and conversion of a ward at McCaw General Hospital, Walla Walla—by U. S. Engineer Office, Portland, Ore. 4-3

YAKIMA CO.—**Stearns-Roger,** Denver, Colo.—$150,000 for the construction of a plant addition at Toppenish, to increase beet pulp drying facilities. Building will be of concrete, with brick walls—by The Utah-Idaho Sugar Co., Toppenish. 4-11

Canada

BRITISH COLUMBIA—**Bennett & White Construction Co., Ltd.,** Vancouver—$200,805 for constr. of a haulout shop at H.M.C. Dockyard at Esquimalt. Work involves erection of two bldgs., one of brick and reinf. conc. and the other a structural steel, frame combination bldg.—by Department of Munition and Supply, Ottawa, Canada.

BRITISH COLUMBIA—**Commonwealth Construction Co., Ltd.,** 670 Taylor St., Vancouver—$92,000 for the construction of a plywood plant, to consist of several separate wood frame bldgs. and a wharf. Plant will cover an area of 40,000 sq. ft. on the Fraser River—by Western Plywood Co., Ltd., Vancouver.

BRITISH COLUMBIA—**Commonwealth Construction Co., Ltd.,** 670 Taylor St., Vancouver—$70,000 for the construction of a new warehouse bldg., at 505 West First Ave., Vancouver—by Johnston National Storage Ltd., Vancouver.

BRITISH COLUMBIA—**H. P. Falls,** Vancouver—$50,000 for construction of a 19-suite apartment block at Jervis and Nelson Sts., Vancouver—by A. R. Dods, Vancouver.

BRITISH COLUMBIA—**Marwell Construction Co., Ltd.,** 410 Seymour St., Vancouver—$46,204 for the construction of a new elementary school at Seventh Ave. East, Vancouver—by Vancouver School Board.

Alaska

ALASKA—**Alaska Construction,** Juneau—$551,000 for the construction of 80 detached dwelling units at Hoonah—by Federal Public Housing Authority, Seattle. 3-16

Miscellaneous...

California

ALAMEDA CO.—**Monson Brothers,** 475 6th St., San Francisco—$120,227 to construct firesafeing and site improvements at Oakland—by Federal Public Housing Authority, San Francisco. 3-26

ALAMEDA CO.—**Scott-Buttner Electric Co.,** 534 20th St., Oakland—$91,677 for an electrical distribution system at the Oakland Army Base—by U. S. Engineer Office, San Francisco. 3-16

SACRAMENTO CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$225,000 for the constr. of a grain elevator with head house, at Andrus Island, one mile north of Isleton—by Riverside Elevators, San Francisco. 4-5

SAN FRANCISCO CO.—**Charles L. Harney,** 625 Market St., San Francisco—$153,598 for construction of facilities for hospital train at Crissy Field, San Francisco—by U. S. Engineer Office, San Francisco. 3-27

SOLANO CO.—**J. A. Bryant,** 2170 28th Ave., San Francisco—$48,049 for the construction of modifications of cross-overs and fire walls at Benicia Arsenal—by U. S. Engineer Office, San Francisco. 4-3

SOLANO CO.—**Collins Electrical Co.,** Stockton—$56,912 for installation of a

street lighting system at Benicia Arsenal—by U. S. Engineer Office, San Francisco. 3-20

SOLANO CO.—**H. H. Larsen Co.,** 64 So. Park, San Francisco—$56,833 for proof firing range at Benicia Arsenal—by U. S. Engineer Office, San Francisco. 4-6

SOLANO CO.—**George M. Robinson & Co.,** 451 Folsom St., San Francisco—$64,604 for the installation of automatic sprinklers at Benicia Arsenal—by U. S. Engineer Office, San Francisco. 4-3

Oregon

CLACKAMAS CO.—**Morrison-Knudsen Co., Inc.,** P. O. Box 1518, Boise, Ida.—$100,000 for the construction of repairs at the power plant at Estacada, about 40 miles southeast of Portland—by Portland General Electric Co., Portland. 3-30

CROOK CO.—**Morrison-Knudsen Co., Inc.,** Hoge Bldg., Seattle—$45,000 for the rehabilitation of 19 mi. of city-owned railroad tracks from Prineville to Prineville Junction—by City Council, Prineville. 3-19

Texas

EL PASO CO.—**Rockwood Sprinkler Co.,** New Orleans 16, La.—$83,973 to furnish and install additional automatic sprinkler systems at William Beaumont General Hospital, Fort Bliss—by U. S. Engineer Office, Albuquerque, N. M. 4-4

OCHILTREE CO.—**Sisco Electric Co.,** 200 Chambers St., Conroe—$176,052 for constr. of 196.8 mi. rural electric lines, near Perryton—by North Plains Electric Cooperative, Perryton.

TARRANT CO.—**Texas Automatic Sprinkler Co.,** 2330 Summer St., Dallas—$51,134 to furnish and install automatic sprinkler system, at Government-owned aircraft plant No. 4, Benbrook—by U. S. Engineer Office, Denison. 4-3

Utah

WEBER CO.—**Perkins Construction Co.,** 400 Dolly Bldg., Salt Lake City—$67,811 for constr. of railroad trackage, paving and drainage and addit. to freight shed at Utah A. S. F. Depot, Ogden—by U. S. Engineer Office, Sacramento, Calif.

Washington

KING CO.—**Morrison-Knudsen Co., Inc.,** Hoge Bldg., Seattle—$80,000 for rehabilitation, sloping and ditching work for the Milwaukee railroad on track-lines from Cedar Falls to Maple Valley—by Milwaukee Railway Co. 3-19

Canada

BRITISH COLUMBIA—**Highway Construction Co., Ltd.,** 789 West Pender St., Vancouver—$50,000 for a realignment job on the Canadian Pacific Railway line four mi. west of Grand Forks. The Kettle Valley railway work involves excavation of 15,000 cu. yds. of rock and laying of 1,500 cu. yds. of concrete.

PROPOSED PROJECTS

Bridge . . .

Washington

KITSAP CO.—The city of Bremerton is planning the construction of a new $2,350,000 Bremerton-Manette bridge, city officials recently announced. 3-17

Territories

ALASKA—Proposal has been announced for the reconstruction of the former Copper River and Northwestern Railway Co. bridge over Eyak River near Cordova. 3-15

Airport . . .

Texas

TARRANT CO.—An 8,200 ft. runway extension has been authorized for the airfield used jointly by Convair's Fort Worth Division and the Fort Worth Army Air Field. U. S. Engineer Office, Denison, has announced the approx. cost will be $2,500,000. 4-6

Water Supply . . .

Washington

GRANT CO.—The city of Ephrata has been granted priorities for construction of a 1,000,000-gal. reinforced conc. tank reservoir and inter-connecting pipelines to cost approx. $72,000. 4-4

Sewerage . . .

California

LOS ANGELES CO.—The Los Angeles County Board of Supervisors is planning

the construction of sanitary sewers and appurtenances in Norwalk Blvd., and other streets in the vicinity of Whittier. The cost is estimated at $213,400. 3-16

LOS ANGELES CO.—The Los Angeles City Council are making plans for the construction of sanitary sewers and appurtenances in Vesper Ave. and Hatteras St., Los Angeles. Estimated cost of project is $64,307. 3-16

LOS ANGELES CO.—The Los Angeles County Board of Supervisors is planning the construction of sanitary sewers and appurtenances in Virginia Ave., and other streets near Clearwater. 3-16

SAN DIEGO CO.—Construction of a new sewage treatment plant for the City of Oceanside at a cost of $150,000 has been approved by the State Dept. of Public Health. 3-21

Colorado

DENVER CO. — U. S. Engineer Office, Denver, is planning construction of a storm drainage system at Fitzsimmons General Hospital, Denver, to cost approx. $100,000. 3-16

Washington

PIERCE CO.—An extension of the Division Ave. trunk sewer to deep water, to be constructed for $25,000, has been approved by the Tacoma City Council. 4-2

YAKIMA CO. — The War Production Board has announced the approval of construction of a sewage disposal plant at Sunnyside, at an approx. cost of $174,750. Work will include constr. of a reinf. concrete sewage disposal plant consisting of a circular clarifier, an operating house, a sludge drying bed, etc. 3-23

Wyoming

SHERIDAN CO.—Plans are being prepared for the construction of a sewage disposal plant at the Veterans Administration Bldg., at Sheridan. Estimated cost is $40,000. 4-5

Waterway . . .

Washington

COWLITZ CO. — As soon as priorities have been granted, construction will begin

on a $225,000 addition to the grain elevator at the port of Longview. 4-6

Building . . .

Arizona

MARICOPA CO. — Richfield Oil Corp., Phoenix, is planning to rebuild their plant which was destroyed by fire. Estimated loss of the Phoenix plant is $100,000. 3-20

California

LOS ANGELES CO.—Approval has been given for construction of 200 additional temporary type portable dwelling units at Upland. Estimated cost of the project is $400,000. 3-20

LOS ANGELES CO.—Plans are being completed for the construction of a material and redistribution center at Roosevelt Base, Terminal Island, for the Navy. Other facilities development will include, four storehouses, 208x602 ft. in area, and administration bldgs. Est. cost is $2,623,000. 3-16

SAN BERNARDINO CO. — Plans are being completed for the construction of 200 family dwelling units to be constructed at Fontana. Project will be under the supervision of Federal Public Housing Authority. 3-16

SOLANO CO.—Plans are being completed for the construction of school projects at Vallejo to cost approx. $750,000, it was announced by the Vallejo Unified School District Board. 3-16

Colorado

ADAMS CO.—Plans are being prepared for the construction of an addition to the U. S. Mint at Denver. Structure will cost approx. $1,000,000. 3-22

DENVER CO. — Work is scheduled to start soon on the constr. of necessary addit. facilities for loading and assembling incendiary bombs at Rocky Mountain Arsenal, Denver. Approx. cost will be $1,331,-022. 3-26

EL PASO CO.—The War Dept. has authorized the expenditure of $1,605,408 for constr. of general and convalescent hospital facilities at the U. S. Army General Hospital, Camp Carson. Work will include, conversion of sta. hospital to a general hospital of approx. 3000-bed capacity; conversion of existing housing to provide hospital facilities for 4500 convalescent patients, etc. 3-26

MESA CO.—Presidential authorization has been received for the construction of a 115-bed veterans' hospital at Grand Junction. 3-20

Idaho

MADISON CO. — Plans have been completed for the construction of a county hospital and for expansion of Ricks Junior College, at Rexburg. Constr. of the hospital will begin in the near future at an estimated cost of $100,000. 3-21

Montana

YELLOWSTONE CO.—Freightways Terminal Co., Seattle, Wash., has received priorities for the construction of a new freight terminal at Billings. Structure to be reinforced conc., 100x200 ft. in area, at an est. cost of $100,000. 3-22

Washington

SNOHOMISH CO.—Plans are being completed for the construction of a two-story and basement brick building, to be utilized as a home for the aged, at Everett. Estimated cost of the structure is $100,000. 4-2

Wyoming

LARAMIE CO.—Working drawings are being prepared for the erection of two schools and a school addition at Cheyenne for the Cheyenne Board of Education. Est. cost is $265,000. 3-21

Territories

ALASKA—Plans for the construction of a three-story frame apartment house at Anchorage to cost approx. $80,000 are being prepared for the owner, E. Dodd of Anchorage. 3-14

Miscellaneous . . .

Texas

BEXAR CO.—Installation of automatic sprinkler systems at the San Antonio Air Depot, Texas, to cost approx. $896,981, has been authorized by the War Dept., Washington, D. C. 3-12

Utah

SALT LAKE CO.—The Utah Power and Light Co., Salt Lake City, has received approval of the War Production Board for construction of 55 mi. of transmission lines in rural areas in north-central Utah, at an estimated cost of $50,000. Work is scheduled to begin in the near future. 3-19

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

UNITED STATES SPRING & BUMPER COMPANY has been awarded the third Army-Navy "E" for high production standards in the manufacture of armor plate for aircraft, tanks, tank retrievers and gun mounts; springs for Army jeeps, half-tracks, and, more recently, in the production of track chains for the "water buffalo."

☆ ☆ ☆

The consolidation of the GILMORE OIL COMPANY and the GENERAL PETROLEUM CORPORATION was recently announced by **A. H. DeFriest,** vice-president of General Petroleum. The new organization will continue under the name and management of General Petroleum Corporation. **Clarence S. Beesemyer,** who has been president of Gilmore since 1944, has been elected to the directorate of General Petroleum Corporation; and **John C. Sample,** for a long time general sales manager of General Petroleum, has likewise been elected a director. Naming of General's **C. H. Wartman** and Gilmore's **H. Alber** as assistant general sales managers, and **W. J. (Jerry) Hawkins,** of Gilmore, as assistant to the general sales manager, are among important appointments announced. Succeeding C. H. Wartman as resident manager of Southern California-Arizona area is **Mark Butterworth. J. B. Erickson** was named assistant resident manager, serving with Mr. Butterworth. In Washington, **Albert E. Horn, Jr.** is resident manager, and **R. F. Johnson** assistant. The Oregon area will be served by **Baxter F. Ball** as resident manager, with Gilmore's **Earl L. Koster** as assistant. In Northern California, **Vern A. Bellman** serves as resident manager, with Gilmore's **Earl L. Koster** as assistant.

☆ ☆ ☆

CALIFORNIA METAL TRADES ASSOCIATION, employer organization representing 250 firms in the Bay Area, announce the following directors for the current year: **George F. Bont,** president of the California Steel Products Co., Richmond; **L. W. Delhi,** vice-president of Western Pipe and Steel Co., San Francisco; **D. E. Golden,** general manager of Schlage Lock Co., San Francisco; **Russel Gowans,** president of Western Crown Cork and Seal Corp., San Francisco; **J. E. Holland,** manager of Pacific Electric Manufacturing Corp., San Francisco; **P. A. Hoyt,** vice-president of Oliver United Filters, Inc., Oakland; **A. E. McIntyre,** general manager of Merco-Nordstrom Division of Pittsburgh Equitable Meter Co., Oakland; **Charles E. Moore,** president of Joshua Hendy Iron Works, San Francisco; **George H. Raitt,** president of Steel Tank and Pipe Co., Berkeley; **Harold H. Smith,** assistant to the president of Grove Regulator Co., Oakland; **G. F. Twist,** vice-president of Atlas Imperial Diesel Engine Co., Oakland.

☆ ☆ ☆

Bob Hughes, Howard Wilson and **Carroll Winrod** announce the establishment of STANDARD MACHINERY CO., with offices at 112 Market Street, San Francisco. The new concern will represent manufacturers of equipment and supplies for construction, highway, mining, logging, marine and industrial uses, throughout the western states.

☆ ☆ ☆

Joseph A. White, superintendent of the Pittsburg Works of COLUMBIA STEEL CO., announced the award of a fourth gold star to this division for continued production achievement of materials for merchant ship construction.

☆ ☆ ☆

The widely advertised "Airplus" Jaeger Air Compressors can now be seen at EDWARD R. BACON CO., 2101 Folsom St., San Francisco 10, Calif. The Bacon Co. is exclusive agent for this advanced design Jaeger compressor. The machines available on the west coast are in the 105 and 210-cu. ft. sizes.

☆ ☆ ☆

H. J. (Jim) Ryan has been appointed Construction Machinery Division Sales Manager for SOUTHWEST WELDING & MANUFACTURING CO., of Alhambra, Calif, as announced by **Earl B. Maloon,** manager of that division. Ryan was formerly with Worthington Pump and Ma-

chinery Co., and more recently with the Navy Department, Bureau of Yards and Docks, at Chicago, Ill. In his new capacity he will direct the sales of Southwest hauling scoops, bulldozers, power control units, track cranes, tamping rollers, heavy duty rippers, dump bodies and other construction equipment.

☆ ☆ ☆

CAPITOL TRACTOR & EQUIPMENT CO., 1001 Del Paso Blvd., North Sacramento, Calif., will represent BUFFALO-SPRINGFIELD ROLLER CO., Springfield, Ohio, in the distribution of Buffalo-Springfield rollers. This line of rollers includes self-propelled 3-wheeled rollers, tandem, 3-axle tandem, trench and patching rollers.

☆ ☆ ☆

The new district sales manager of the Los Angeles office of PACIFIC PORTLAND CEMENT CO. is **Robert B. Soldini.** He will be in charge of sales for all of southern California, as well as Arizona and the southern part of Nevada, for the products of the cement and gypsum divisions of the company. Of the more than twenty years Soldini has been connected with the building material industry, seventeen have been in the cement business.

☆ ☆ ☆

INTERMOUNTAIN

On January 1 the INTERMOUNTAIN EQUIPMENT CO. of Boise, Idaho, purchased the Spokane and Walla Walla branches of HOWARD-COOPER CORPORATION and have opened offices in Spokane, Wash. **E. L. Haines** is manager of the new division, assisted by **O. E. Whitney, J. P. Finlay** and **Merle Skinner.** Complete shop and service facilities are

available at both Spokane and Walla Walla. The company will represent in the new area essentially the same manufacturers they represent in the Boise and Pocatello territory, among which are INTERNATIONAL HARVESTER CO., J. D. ADAMS CO., BUCYRUS-ERIE CO., INGERSOLL-RAND CO., BLAW-KNOX CO., IOWA MANUFACTURING CO., JOHN A. ROEBLING'S SONS CO., MANNING, MAXWELL & MOORE, INC., WINSLOW ENGINEERING SALES, CLEAVER-BROOKS CO., E. D. ETNYRE CO. and various other allied lines.

☆ ☆ ☆

PACIFIC NORTHWEST

Amedee H. Smith, 76, pioneer west coast industrialist, died March 25 in Portland, Oregon. Smith was chairman of the board of directors of HYSTER COMPANY; president of WILLAMETTE IRON AND STEEL CO., a director of PORTLAND GENERAL ELECTRIC CO., and president of OREGON PARAMOUNT CORPORATION. Smith was one of the best known business leaders of the west coast. He was also one of the formulators of the Oregon Workmen's Compensation Act.

☆ ☆ ☆

R. M. Ashley, for the past four years excavator sales engineer for HARNISCHFEGER CORPORATION in Montana, Idaho and parts of Wyoming and Washington—with headquarters at the P&H Seattle office—was recently transferred to the Chicago district. Most of Ashley's life has been spent in the construction machinery field. At one time he served as secretary to the Cheyenne, Wyoming, Chapter of the Associated General Contractors of America. Replacing Ashley in the Seattle territory is **Ralph H. Bowers,** who is promoted to sales engineer after two years as service engineer. His progress is in line with the P&H policy to promote men having a substantial background of construction experience and mechanical ability, combined with a knowledge of repair parts.

☆ ☆ ☆

AMONG THE MANUFACTURERS

CATERPILLAR TRACTOR CO., Peoria, Ill., announced the advancement of **M. T. Deames** to Assistant General Parts Manager. Assisting Deames will be **A. H. Yingst,** for Export and Governmental Sales; **T. H. Hodgins,** for the Central Sales Division; **C. M. McKnight,** for Western, and **B. W. Kram,** for Eastern Sales Divisions. Other appointments include **E. L. Mason, H. F. Haven** and **C. D. Byrns** to the position of assistant parts managers of Central, Western and Eastern Sales Divisions, respectively.

☆ ☆ ☆

E. I. DU PONT DE NEMOURS & CO. annual report issued March 16, 1945, shows the company's 1944 sales were $622,062,712, about 6 per cent greater than in 1943. Net income amounted to $80,870,106, or 16 per cent greater than the previous year. Earnings on the common stock for 1944, after paying dividends of $4.50 a share on the preferred stock, amounted to $6.60 a share; dividends paid on the common stock aggregated $5.25 a share. Plant expansion during the year amounted to $24,500,000; all of this expenditure was for additional manufacturing capacity for products required for war. Increased plant facilities were chiefly for the production of nylon yarn, "Cordura" viscose rayon yarn used in pneumatic tires, "Ponsol" vat dyes, nitric acid, DDT insecticide, and sodium.

☆ ☆ ☆

Carl F. Oechsle has been appointed vice-president in charge of sales of RANSOME MACHINERY CO., of Dunellen, New Jersey, a subsidiary of WORTHINGTON PUMP AND MACHINERY CORP. The sale of Ransome's line of contractor's mixers and pavers will now be handled through Worthington's Construction Equipment Department, of which Oechsle is manager.

Douglas W. Vernon has been appointed General Manager of Sales for A. LESCHEN & SONS ROPE CO., of St. Louis, Mo. He has been connected with the wire rope industry for 20 years.

☆ ☆ ☆

The name of STEEL HEATING BOILER INSTITUTE, INC., has, by a vote of the membership, been officially changed to STEEL BOILER INSTITUTE, INC. Steel Boiler Institute, Inc.,

includes manufacturers of various types of heating and power boilers. For some time it has been thought that the use of the word "heating" in the name implied restrictions on the products of manufacturers which did not exist, because members produce boilers for both low pressure heating and high pressure power and process use.

☆ ☆ ☆

Guy F. Rolland has been appointed Director of Reynolds Experiment Laboratory, the explosive research facilities of ATLAS POWDER CO., near Tamaqua, Pa., **W. B. Blakey,** Director of Atlas High Explosives Manufacturing Division, has announced.

☆ ☆ ☆

BARBER-GREENE CO., of Aurora, Ill., manufacturer of asphalt equipment and material handling equipment, has announced the appointment of **John H. Dykstra** as Advertising Manager. Dykstra, formerly with Mumm-Mullay & Nichols, Inc., Columbus, Ohio, advertising agency, succeeds **Blaine S. Britton,** who has resigned to go into publicity work for himself.

☆ ☆ ☆

H. S. Chase, vice-president in charge of manufacturing, and **Drew L. Hines,** vice-president in charge of transportation, have been elected directors of TIDE WATER ASSOCIATED OIL CO., according to an announcement made by **William F. Humphrey,** president. **K. R. Hankinson,** vice-president and treasurer, has been appointed a member of the Eastern Division Operating Committee.

☆ ☆ ☆

The board of directors for AMERICAN LUMBER & TREATING CO., of Chicago, announces the appointment of **H. H. Humphreys** as secretary-treasurer; **J. Gardner Coolidge** and **Paul Wayman** were named vice-presidents. Both Humphreys and Wayman came to the Chicago office of the lumber treating concern in 1938. Coolidge is eastern district manager.

NEW EQUIPMENT

Portable Supply Tank

Manufacturer: Wood Manufacturing Co., Los Angeles, Calif.

Equipment: Portable supply tank equipped with power pump.

Features Claimed: This wood portable supply tank can be used with other traveling mixing plants and for any off-the-highway work. Built for carrying road oils, emulsions, and cut-backs, this supply tank can be used for the transfer or storage of practically any fluids. The 3,000-gal. tank

is divided into 1,000 and 2,000-gal. compartments. A 3-in. Roper pump, powered with either a Chrysler or Ford industrial engine is mounted at the rear. Construction features include tandem rear wheels mounted on a walking beam to eliminate twisting and torsional stresses. Specifications: Height overall, 9 ft. 6 in.; width overall, 8 ft. 5 in.; length, including tongue, 27 ft. 6 in.; weight, 9,640 lb.; tire size, 10:00x20. Bulletin and prices upon application.

Welding Rod

Manufacturer: Lincoln Electric Co., Cleveland, Ohio.

Equipment: New all-position welding electrode.

Features Claimed: A new shielded arc electrode for general purpose welding of mild steel which offers a number of outstanding advantages over existing electrodes of the same classification. The new electrode, designated as "Fleetweld 47," offers such advantages as extremely low spatter loss, easy slag removal, excellent restriking characteristics, and other improved features. "Fleetweld 47" conforms to American Welding Society electrode specifications Class E-6012 and E-6013 and may be used with either AC or DC current. This electrode is especially well suited for making high speed horizontal or flat fillet welds in which the coating can be dragged on both plates. It has also been used extensively for

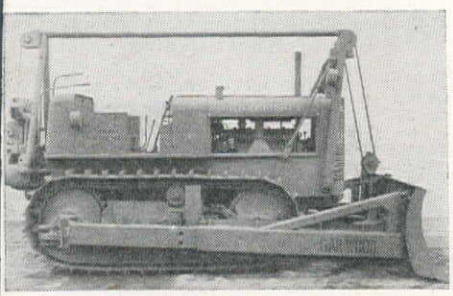
both vertical and overhead fillets, especially where large single pass fillets are desired. Complete penetration of ¼-in. plate can be obtained by welding one pass from each side. This "Fleetweld 47" electrode is available in the following sizes: $\frac{5}{32}$x14 in.; $\frac{3}{16}$x14 in.; ¼x18 in., and $\frac{5}{16}$x18 in., packaged in 50-lb. containers.

Angle Dozer

Manufacturer: Gar Wood Industries, Detroit, Mich.

Equipment: Cable operated angling blade type dozer.

Features Claimed: This new dozer of the angling blade type is designed to place the moldboard close to the radiator for better balance and easier pushing. Tilting of the moldboard is achieved by the use of a double trunnion on the main frame which eliminates the necessity of installing a tilt-



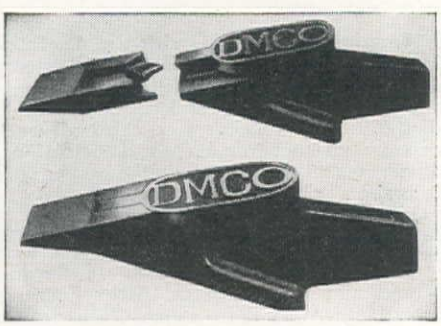
ing mechanism on the moldboard itself. There are no screw thread adjustments to get battered. The sheaves are of steel, hardened in the rope grooves and mounted on hardened and ground shafts with roller bearings for longer life. For operating the Dozecaster, Gar Wood Industries offers its cable control unit in both single and double drum types.

Two-Piece Dipper Tooth

Manufacturer: Daniels - Murtaugh Co., Cedar Rapids, Iowa.

Equipment: Replaceable digging tooth for dippers.

Features Claimed: The new dipper tooth was developed to be used on a variety of digging and loading equipment. This two-piece Wear-Sharp tooth has a "Penetrator Point" and a "Weldapter" base, designed to make it easy to replace the points and secure them by tack-welding. The weld holds



the point in place only, while the double-keyed supports, one lengthwise and one crosswise of both parts, take all the digging stresses as well as side thrusts and impact shocks. An obvious saving in welding materials and man hours can be effected when these teeth are used. The "Penetrator" point is designed to stay sharp down to the time half of part is worn away. The parts are fabricated of high quality heat-treated alloy steel forgings.

Rivet Gun

Manufacturer: Cherry Rivet Co., Los Angeles, Calif.

Equipment: Lightweight rivet gun.

Features Claimed: The G-35 lightweight rivet gun was developed to install Cherry Blind Rivets in hard-to-get-at blind spots.

It is operated by one hand, installing rivets from one side of the job, with a pulling force. The pulling head is notched so that it snaps onto or off the gun quickly, which increases the flexibility of the equipment. The gun is small and compact, measures only 11½ in. in length, weighs approximately 1½ lb. It is adapted for installing Cherry Blind Rivets in sheet metal, plywood, rubber, plastics and almost any soft or brittle material. The gun is inexpensive and may be purchased singly or in a special kit.

LITERATURE FROM MANUFACTURERS . . .

E. I. Du Pont de Nemours & Co., Wilmington, Dela.—An address delivered by Dr. E. K. Bolton, chemical director of du Pont on the occasion of the presentation to him of the Perkin Medal of the American Section of the Society of Chemical Industry, New York City, on January 5, 1945, has been printed in booklet form under the title "du Pont Research." The booklet gives the history, growth and organization of the company's research activities

from the beginning of the company in 1802 to date.

Olson Manufacturing Co., Boise, Idaho —Recently released by the company is a 24-page booklet under the title of "The Story of Olson City," which is an account of 35 years in the life of an industry—the development of a one-man shop into an efficient steel fabricating plant.

The LaBour Co., Inc., Elkhart, Ind.—The "Jetting" Process — How to Sink a Pile Without a Piledriver is the subject of Bulletin No. 52. The simple process of jetting is described and a cut illustrates the LaBour SFI pump, while a photograph shows a fishing pier being set by the jetting process with the pump performing off shore. Two cuts are also used to illustrate the equipment.

Ideal Commutator Dresser Co., Sycamore, Ill.—How modern "Ideal" electric soldering tools and methods can speed up and reduce soldering costs, is outlined in a recent brochure. The important features of the equipment and its many uses are pointed out and typical applications are shown.

Dresser Manufacturing Division, Bradford, Pa.—Suggestions on how to avoid confusion and difficulties resulting from a concerted effort to replenish depleted stocks when peace comes is the subject of a folder recently issued by this division of Dresser Industries, Inc. Five recommendations are listed for the placing of orders with the greatest fairness to all customers.

Continental Industries, Inc., New York, N. Y.—An address recently delivered before the Newcomen Society in New York City by Robert S. Holding, president and general manager of Franklin Machine & Foundry Co., Providence, R. I., has been published in booklet form. It is the interesting life story of George H. Corliss whose inventive ability gave birth to the famous Corliss engine and accounted for a total of seventy patents covering steam engines, pumping engines, machine tools, boilers and a variety of technical appliances.

Victor Equipment Co., San Francisco, Calif.—A new and larger size handbook titled "Setting Up a Victor Welding or Cutting Unit" has been published by the company. Its 46 pages tell in simple and understandable language how to assemble a welding or cutting outfit and very fine photographs help illustrate the different stages of application. Suggestions as to nozzle or tip size selection for various metal diameters to be welded or cut are given and as an aid in avoiding hazardous practices a few important "Don'ts" are enumerated. This booklet is designed as a help to welding students and beginners and for use in vocational training schools.

Buick Motor Division, General Motors Corp., Flint, Mich.—A booklet has recently been released by the company telling the general story of Buick men and women and machines effectively at work in the service of their country. This is a handsomely illustrated and interesting publication.

Builders - Providence, Inc., Providence, R. I.—Bulletin 318B recently released describes the Flo-Watch, a precision instrument for use in the efficient distribution and use of liquids, steam, air and gas—measuring the flow through standard differential producers such as Venturi tubes, nozzles and orifices and adaptable for use with Kennison open nozzles, flumes and weirs. Brochure is amply illustrated with cuts, diagrams and charts.

Hyster Co., Portland, Ore.—A series of three new 7 page booklets which describe the operation and productivity of Hyster 20 lift, 75 lift and 150 lift trucks. These books are illustrated abundantly with action photographs and give complete details concerning description and specifications of the three sizes of fork lift trucks put out by this company.

Wire Rope Mfg. & Equipment Co., Seattle, Wash.—A leaflet entitled "For Action and More Action" lists the western dealers of the Double Blue Line wire rope manufactured by the company and is illustrated with pictures showing this type of wire rope in use.

American Hoist & Derrick Co., St. Paul, Minn.—A revised edition of the "Crosby Clip" booklet, CCB-11B, gives full details about the Crosby clips and contains a table of the number of clips to use for all sizes of rope up to three inches. Illustrations, diagrams and pictures show the proper way to make a wire rope fastening.

Young Iron Works, Seattle, Wash.—Have issued a new leaflet listing the new improved features of Manganese Bardon Hooks and Maxten Metal Alloy Ferrules manufactured by the company. This leaflet is well illustrated and shows how to attach ferrules and the tools used for this purpose.

Bucyrus - Erie Co., South Milwaukee, Wis.—"In War and Peace" is the title of a new 34 page book put out by the company. This handsomely illustrated brochure presents a vivid picture of the importance of excavation, by photographs of dozers, scrapers, dozer-shovels and other tractor equipment in action on both the war and home fronts.

Standard Steel Corp., Los Angeles, Calif.—A new bulletin, No. S5, introduces a new two-way power broom having many excellent features. The Standard features and the two-way principle are explained and illustrated in the leaflet, as well as specification details.

Red Star Products, Inc., Cleveland, O.—Have published a bulletin demonstrating by pictures and explaining the operation and handling of the Multiplex-30A radial arm saw. This saw is distinctive in its versatile elbow which permits cutting a greater number of miters than is ordinarily possible with other saws. Three drill speeds are afforded, including the exceptionally high speed of 10,000 R.P.M., because of the radial arm high speed drill attachment.

Marmon-Herrington Co., Inc., Indianapolis, Ind.—By means of a new brochure the many steps required in the furnishing, packing and shipping of maintenance and repair parts of Marmon-Herrington vehicles are outlined. Information and suggestions to dealers and users as to the best procedure to follow in the placing of parts orders is submitted and on a loose leaf is pictured a sample parts-order properly executed.

Victor Equipment Co., San Francisco, Calif.—The newest annual booklet, "The Future of Welding" (Form 50), is dedicated to an explanation of the scope of Victor's activities and the many services the company is able to render during the war and the peacetime years to follow. In its pages will be found depicted the old as well as new processes in the field of welding and several paragraphs afford the reader a glimpse of what can be expected in the future. Three color charts in the back of the book illustrate interesting facts about the welding industry.

Chain Belt Co., Milwaukee, Wis.—Bulletin 466, just published, contains a wealth of information on "Pumpcrete," a machine for the pumping of concrete. Photographs help to tell the story of its operation, what it is able to do and its special features. Accompanying the photos and descriptive material are several charts and graphs, with two pages devoted to dimensions and specifications. One section is applied to questions and answers regarding Pumpcrete's performance.

Atlas Powder Co., Wilmington, Del.—The company's new catalog on explosives is now available in Spanish to all interested parties. Listed are all standard explosives and blasting supplies, with their principal characteristics, strength, velocity, cartridge count, etc. It contains chapters on the use of explosives in the building of roads, in mining, in rock and boulder blasting and in ditching. Information on how to prime and handle explosives is included, as well as several practical safety suggestions.

Walter Bates Co., Inc., Joliet, Ill.—Catalog No. 43-44 on open steel flooring and stair treads suggests ideas for improved design and construction. In its 16 pages is shown how and where steel grating can be economically installed and it also contains information on care and maintenance. Many fine pictures illustrate the equipment and a table for the determining of safe loads is also provided.

OPPORTUNITY SECTION

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